

7-6-2012

# A Comparative Study of User Preferences of a Personalized Academic Website

Dipti U. Desai

*Purdue University*, [deeptydesai1985@gmail.com](mailto:deeptydesai1985@gmail.com)

Follow this and additional works at: <http://docs.lib.purdue.edu/techmasters>



Part of the [Other Computer Engineering Commons](#)

---

Desai, Dipti U., "A Comparative Study of User Preferences of a Personalized Academic Website" (2012). *College of Technology Masters Theses*. Paper 72.

<http://docs.lib.purdue.edu/techmasters/72>

This document has been made available through Purdue e-Pubs, a service of the Purdue University Libraries. Please contact [epubs@purdue.edu](mailto:epubs@purdue.edu) for additional information.

**PURDUE UNIVERSITY**  
**GRADUATE SCHOOL**  
**Thesis/Dissertation Acceptance**

This is to certify that the thesis/dissertation prepared

By Dipti Uday Desai

Entitled

A COMPARATIVE STUDY OF USER PREFERENCES OF A PERSONALIZED ACADEMIC WEBSITE

For the degree of Master of Science

Is approved by the final examining committee:

Prof. Alka Harriger

Chair

Prof. Alejandra Magana

Prof. Eric Matson

Prof. John Springer

To the best of my knowledge and as understood by the student in the *Research Integrity and Copyright Disclaimer (Graduate School Form 20)*, this thesis/dissertation adheres to the provisions of Purdue University's "Policy on Integrity in Research" and the use of copyrighted material.

Approved by Major Professor(s): Prof. Alka Harriger

Approved by: Prof. Jeffrey Whitten

Head of the Graduate Program

06/19/2012

Date

**PURDUE UNIVERSITY  
GRADUATE SCHOOL**

**Research Integrity and Copyright Disclaimer**

Title of Thesis/Dissertation:

A COMPARATIVE STUDY OF USER PREFERENCES OF A PERSONALIZED ACADEMIC  
WEBSITE

For the degree of Master of Science



I certify that in the preparation of this thesis, I have observed the provisions of *Purdue University Executive Memorandum No. C-22*, September 6, 1991, *Policy on Integrity in Research*.\*

Further, I certify that this work is free of plagiarism and all materials appearing in this thesis/dissertation have been properly quoted and attributed.

I certify that all copyrighted material incorporated into this thesis/dissertation is in compliance with the United States' copyright law and that I have received written permission from the copyright owners for my use of their work, which is beyond the scope of the law. I agree to indemnify and save harmless Purdue University from any and all claims that may be asserted or that may arise from any copyright violation.

Dipti Uday Desai

\_\_\_\_\_  
Printed Name and Signature of Candidate

06/19/2012

\_\_\_\_\_  
Date (month/day/year)

\*Located at [http://www.purdue.edu/policies/pages/teach\\_res\\_outreach/c\\_22.html](http://www.purdue.edu/policies/pages/teach_res_outreach/c_22.html)

A COMPARATIVE STUDY OF USER PREFERENCES OF A PERSONALIZED ACADEMIC  
WEBSITE

A Thesis

Submitted to the Faculty

of

Purdue University

by

Dipti Desai

In Partial Fulfillment of the

Requirements for the Degree

of

Master of Science

August 2012

Purdue University

West Lafayette, Indiana

To my family: for their unconditional love, faith, understanding, and support.

## ACKNOWLEDGEMENTS

I would like to take this opportunity to acknowledge all the people who have supported the initiation and completion of this thesis. I would like to thank my major professor and chair of my thesis examining committee, Professor Alka Harriger, for her vision, guidance, and support throughout the research. Her much needed help and ideas made it possible for me to formulate my research question and motivated me to work towards answering it. I would also like to thank the other members of my examining committee; Professor Alejandra Magana, Professor Eric Matson and Professor John Springe, for their valuable insights and suggestions that helped me improve my work. Professor Magana's continual encouragement and mentoring has been invaluable.

I am thankful to Professor James Mohler for helping me compose and format my thesis document; and for reviewing it. I am grateful to Guity Ravai, for her support and consideration. I am also thankful to Byju Govindan for his help, consultation and mentoring.

Lastly, I would like to express thanks to my family and friends for always being there for me.

## TABLE OF CONTENTS

	Page
LIST OF TABLES .....	vi
LIST OF FIGURES .....	vii
ABSTRACT .....	viii
CHAPTER 1 INTRODUCTION .....	1
1.1 Statement of Problem.....	1
1.2 Research Question(s) .....	2
1.3 Scope .....	3
1.4 Significance.....	3
1.5 Assumptions .....	5
1.6 Limitations .....	6
1.7 Delimitations .....	6
1.8 Definitions .....	7
1.9 Summary .....	8
CHAPTER 2 LITERATURE REVIEW .....	9
2.1 Introduction.....	9
2.2 An overview of current state of STEM careers .....	10
2.3 Tackling declining interest in STEM .....	11
2.4 Underrepresented minorities in STEM .....	13
2.5 Influencing the choice of major by students .....	15
2.6 Website Usability.....	16
2.6.1 Detailed Technological Background.....	17
2.7 Choice of Statistical Tests for Data Analyses .....	18
2.8 Summary .....	19
CHAPTER 3 WEBSITE DESIGN AND EVALUATION .....	20
3.1 Website Design.....	20

	Page
CHAPTER 4 STUDY DESIGN AND EVALUATION .....	36
4.1 Data Collection Procedure .....	36
4.1.1 Institutional Review Board (IRB) .....	38
4.2 Data Collection Instrument .....	39
4.2.1 Validity and Reliability of the Instrument .....	40
CHAPTER 5 DATA ANALYSIS .....	42
5.1 Preparing Data for Analysis.....	42
5.2 Choice of Statistical Tests.....	45
5.3 Data Analysis – Quantitative .....	46
5.3.1 Consolidating Quantitative Data Analyses .....	70
5.4 Data Analysis – Qualitative .....	71
5.4.1 Implementing Qualitative Responses .....	72
5.5 Discussion.....	76
5.5.1 Limitations of the Study .....	77
5.6 Recommendations for Future Studies .....	80
LIST OF REFERENCES .....	83
APPENDICES	
Appendix A CIT Info Sheet .....	90
Appendix B SAS Scripts .....	92
Appendix C Qualtrics Web Survey Tool .....	94
Appendix D Approved IRB Protocol and Amendment.....	96
Appendix E Survey Instrument .....	98



## LIST OF TABLES

Table	Page
Table 2.1 Race and degrees .....	14
Table 4.1 Survey Administration .....	38
Table 5.1 Survey Administration with Sample Sizes .....	43
Table 5.2 Raw Data Fields .....	43
Table 5.3 Categorization of Data Fields .....	44
Table 5.4 Chi-square table of two-way frequencies .....	47
Table 5.5 Chi-square table of one-way frequencies.....	47
Table 5.6 Chi Square Test for Equal Proportions .....	47
Table 5.7 Chi-square test for question 2 .....	49
Table 5.8 Chi-square statistic for question 2 .....	49
Table 5.9 Logistic regression for question 3 .....	51
Table 5.10 Logistic regression for question 7 .....	54
Table 5.11 Logistic regression for question 8 .....	55
Table 5.12 Logistic regression for question 9 .....	57
Table 5.13 Logistic regression for question 10 .....	59
Table 5.14 Logistic regression for question 11 .....	61
Table 5.15 Logistic regression for question 13 .....	62
Table 5.16 Logistic regression for question 16 .....	65
Table 5.17 Logistic regression for question 18 .....	67
Table 5.18 One-way frequencies for count of error of Re-developed website.....	69
Table 5.19 Chi Square Test for Equal Proportions for Table 5.18.....	69
Table 5.20 One-way frequencies for count of error of Old website .....	69
Table 5.21 Chi Square Test for Equal Proportions for Table 5.20 .....	70
Table 5.22 Categorizing Response Variables .....	70
Table 5.23 Interactive model of logistic regression .....	71
Table 5.24 Categories perceived out of qualitative responses to questions 22 & 23 .....	73
Table 5.25 Survey Durations .....	79

## LIST OF FIGURES

Figure	Page
Figure 2.1 STEM Pipeline .....	10
Figure 2.2 Breakdown of STEM enrollment by Race .....	13
Figure 3.1 Screenshots to compare look and feel of websites .....	24
Figure 3.2 Screenshots to compare interface consistency .....	25
Figure 3.3 Use of free space.....	26
Figure 3.4 Wasting the empty space on old website .....	27
Figure 3.5 Using the empty space on existing webpage .....	27
Figure 3.6 Sample email personalized to suit the student's choice of area of interest....	28
Figure 3.7(a) Personalization based on ethnic background – step 1 .....	30
Figure 3.7(b) Personalization based on ethnic background – step 2 .....	31
Figure 3.8 National Center for Education Statistics Web Tool .....	32
Figure 3.9 Illustration of web tool on NCES website .....	34
Figure 3.10 Sample email to CIT department coordinator .....	35
Figure 4.1 A comparative usability evaluation work-flow .....	37
Figure 5.1 Counts for categorical response variable for question 3 .....	50
Figure 5.2 Distribution of participants recommending re-designed website .....	52
Figure 5.3 Counts for categorical response variable for question 7 .....	53
Figure 5.4 Counts for categorical response variable for question 8 .....	55
Figure 5.5 Counts for categorical response variable for question 9 .....	57
Figure 5.6 Counts for categorical response variable for question 10 .....	58
Figure 5.7 Counts for categorical response variable for question 11 .....	60
Figure 5.8 Counts for categorical response variable for question 13 .....	62
Figure 5.9 Counts for categorical response variable for question 16 .....	65
Figure 5.10 Counts for categorical response variable for question 18 .....	67
Figure 5.11 Error on Re-developed website .....	68
Figure 5.12 Error on Old website .....	69
Figure 5.13 Design improvements .....	75

## ABSTRACT

Desai, Dipti U. M.S., Purdue University, August 2012. A Comparative Study of User Preferences of a Personalized Academic Website. Major Professor: Alka Harriger.

There has been a growing concern over the enrollment by American students into Science, Technology, Engineering and Mathematic (STEM) fields of study. Following globalization there is a direct competition for jobs in the United States with lower-wage workers around the globe and the US, thereby, is on the verge of losing its global technological competitiveness (Committee on Prospering in the Global Economy of the 21st Century: An Agenda for American Science and Technology, National Academy of Sciences, National Academy of Engineering, Institute of Medicine, 2007). Governmental as well as non-profit organizations are constantly searching for ideas, programs and initiatives that encourage more US citizens to consider STEM careers. One of the most common recommendations out of these councils and existing programs is to involve such groups whose numbers in STEM do not match well with their numbers as a proportion of the overall population of the nation. Underrepresented groups need more attention, personalization, motivation and encouragement by institutions and industries for the government to practically achieve their targeted numbers in STEM (Business-Higher Education Forum, 2010). In the Internet age, with resources highlighting the

importance of Internet personalization and website usability principles to web users, this study focuses on redesigning the Computer and Information Technology (CIT) department website to provide prospective students with a more personalized experience, and learn their perceptions of the website, its contents and usability.

## CHAPTER 1 INTRODUCTION

This chapter introduces the study with the problem statement, research question, scope, significance, and the definition of key terms. The assumptions, limitations and delimitations of the research work are also discussed.

### 1.1 Statement of Problem

There are resources with astonishing statistics (Commission on Professionals in Science and Technology, 2007; Lowell & Regets, 2006) that highlight the critical need for the United States to fight the declining interest in Information Technology (IT) by its citizens. Although entrance into the STEM fields has grown, it is not enough to cope well with the overall needs of the labor market. With increased global competition, America needs to take preventive and corrective action now to maintain its long-existing and current lead in STEM fields. Both government and industry should address the serious deficit in the supply of STEM workers. This study sought to contribute to these national efforts by helping the Department of Computer and Information Technology at Purdue University better reach prospective students from underrepresented minorities by the means of its website. Websites being one of the important, most up-to-date and easily accessible sources of information about a college or university (Bernier, Barchein, Canas,

Gomez-Valenzuela, & Merelo, 2005), this research focused on a prospective student's experience about using a department website and its usability in comparison to the older one that was not built with these principles in mind. A student visitor to the academic website is fairly analogous to a consumer visiting a commercial website. So, a site visitor's perception of usability plays an important role in understanding if he/she finds a particular website to be useful and appealing (Zhang, Dran, Blake, & Pipithsuksunt, 2000), and thereby, can make an informed decision about his/her next steps of interaction with the website. This study, therefore, sought to understand a student's perception of the redesigned department website that personalized its response to the student based on cultural markers. In relation to the ethnicity and the gender of a student website visitor, it offered a variety of relevant information about the program and other initiatives at the school.

### 1.2 Research Question(s)

1. Will enhancements made to a prospective student website by employing cultural markers to personalize the interaction increase its appeal to the user over one that doesn't?
2. Does the order in which the old and new websites are presented to the user impact the appeal of either website?

### 1.3 Scope

For the purpose of this study, the scope of the problem was confined to observing students who accessed the redesigned CIT department website. Factors such as unavailability and difficulty in exercising control due to geographical distance narrowed the subject population to only students from Purdue University, West Lafayette and their views/opinions about the old and new websites. The personalization of information from the website was limited to only the ethnic background of a student. For example, when an African American student visits the website and enters his/her ethnicity as African American, she/he is informed of the Black Cultural Center and its activities. Additionally, there was also some personalization based on a gender of the student that was included while re-designing the website. For example, when a female prospective student visits the website, she is presented with the information about Women in Technology initiative in the College of Technology. Further advanced and validated strategies could be employed in the future to personalize the experience based on gender.

### 1.4 Significance

It is hoped that the efforts involved in this research can help prospective students make better informed decisions to pursue STEM majors at Purdue University and encourage diversity in the student community in the Department of Computer and Information Technology. The approach compared the old and new websites for the prospective students who visit the CIT department website. The new website

implemented a component of personalization based on the student's demographic information, including ethnicity, gender, and choice of interest(s). Behind the scenes (without any knowledge to the student), the web tool was also designed to get the Diversity Office in the College of Technology involved by propagating the student information to the designated email address when a prospective student from an underrepresented background contacts the Department of Computer & Information Technology. The study, thereby, attempted to understand elements of an effective design for a college website so that it could help students obtain information about the college and its initiatives for students from different ethnic backgrounds. The results of this study provided insights into design approaches that make an academic website usable from a student's perspective. The effort also sought to inform students of various diversity programs that are offered by the college from time to time (e.g., Discovering Opportunities in Technology (DOiT), Windows of Opportunity for Women in Technology (WOW iT)). A successful implementation of this study, in showing that a customized/personalized website can be perceived as useful and appealing from the participants' point of view, could be further adopted by other departments, schools/universities and STEM recruitment programs in effectively re-designing their websites for prospective students and/or for their outreach programs.

The rationale for this study was based on literature that supports the belief that personalization tends to be more engaging for users (Liu, 2008) and hence, can be incorporated as one of the approaches to encourage prospective students to consider



technology as one of their majors. The study also focused on the ideas and expressions that enhance the perceived ease of use, and thereby, the usability of a website (Venkatesh, 2000; Nielsen, 2003). It was further supported by the idea that personalized information from the departments will help students know more about the major, allowing them to make an informed decision instead of relying on their friends and/or family, as pointed out by a study by Beggs, Bantham and Taylor (2008).

### 1.5 Assumptions

The assumptions of this research included:

1. Students have basic computer literacy, including using computers to take surveys and navigate the upgraded website.
2. The study used undergraduate students (enrolled in freshmen-level class) from Purdue University instead of potential prospective students because the attitudes of these two groups of students can be considered close enough matches (Ferrari & Parker, 1992).
3. Students are able to provide their background details such as school information and ethnicity.
4. Students visiting the website have not yet totally determined their college major, so this study has an opportunity to influence their interest in a STEM major.

### 1.6 Limitations

The limitations of this study included:

- The researcher had no control over the survey responses that were not reported on time by students or lab teaching assistants for the course.
- The respondents of the survey were students from the College of Technology, and any information sought about their ethnicity that thereby reveals their identity is prohibited by university policies. This is because some of the populations are small enough to make it possible to identify individual students. Therefore, although the survey requested this information, it was not recorded for the purposes of study analysis.
- While assessing the quality of academic websites (Olsina, Godoy, Lafuente, & Rossi, 2010), three different audiences to consider regarding visitor view are: current and prospective students, academic personnel and research sponsors. This study focused its efforts only on prospective students.

### 1.7 Delimitations

The delimitations of this research study included:

- Due to the budget and geographical limitations, the subjects for this study were current students from Purdue University rather than actual, prospective students.

- Students from different geographical regions were excluded from this study because of the difficulty to reach them within the boundaries of time and budget.
- The study was solely based on students' responses to the questionnaire and their opinions on how well personalized responses to students' inquiries can affect a student's perception of a computing education website in comparison to its old counterpart.
- Although characteristics like portability, maintainability are related to website usability, because these were not relevant to the website audience of prospective students, they were not evaluated in this study.
- The survey was administered during the last eight weeks of the spring 2012 semester, and data analysis was conducted during the first 5 weeks of summer 2012.

### 1.8 Definitions

Cultural markers: Attributes that reveal cultural or societal norms (Barber and Badre, 1998).

HCI (Human-Computer Interaction): Refers to the way that people use computer technology to perform a task (Fallman, 2003).

Shrinking pipeline: Refers to the phenomenon in which a specific group decreases dramatically in representation from high school to graduate school (Camp, 1997).

STEM: Science, Technology, Engineering and Mathematics disciplines referred collectively as this acronym (Koonce, Zhou, Anderson, Hening, & Conley, 2011).

Underrepresented minorities: Any ethnic group – African American, Hispanic, Native American – whose representation is disproportionately less than their proportion in the general population (Gillett-Karam, Roueche, & Roueche, 1991).

### 1.9 Summary

This chapter presented an overview to the research work, including scope, significance, research question and definitions. The next chapter outlines the motivations for this research and the approaches considered.

## CHAPTER 2 LITERATURE REVIEW

### 2.1 Introduction

The literature review section reviews past scholarly work on the prevailing state of the STEM (Science, Technology, Engineering and Mathematics) workforce in the United States, and what measures have been taken or proposed to increase the engagement and retention in STEM fields of employment. It also discusses factors that influence the college major choice of undergraduate students to encourage them to consider STEM as one of their preferred career options and how underrepresented minorities currently do not constitute a corresponding proportion of the STEM labor force as compared to their majority counterparts. It also shares deficiencies in the current design of the CIT department's website to respond to prospective students in a customized way, depending on their ethnic background. Literature from varied sources is referenced and papers from a gamut of disciplines such as education and psychology are included.

## 2.2 An overview of current state of STEM careers

The death of distance (Cairncross, 1997) that marks the communications revolution has caused a nearly exponential growth in the advancements all across the globe. The current state of STEM education has caused concern for the United States regarding its standing as a leader among other nations (The President's Council of Advisors on Science and Technology, 2010). There is a national urgency in the global technological competitiveness (Jackson, 2002; The President's Council of Advisors on Science and Technology, 2012). Figure 2.1 illustrates the shrinking pipeline in STEM. Fewer than 40% of the students who choose STEM majors in college complete their STEM degree (The President's Council of Advisors on Science and Technology, 2012).

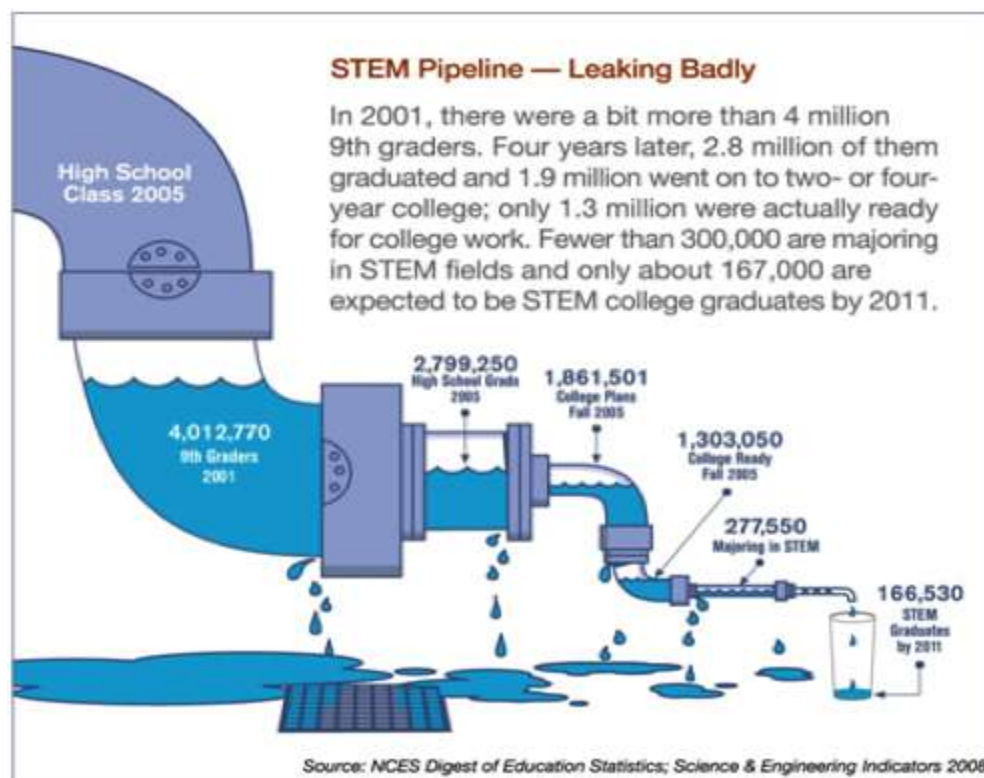


Figure 2.1. STEM Pipeline (NCES Digest of Education Statistics; Science & Engineering Indicators 2008)

With the advent of globalization, the United States, which has been an economic and strategic leader in the world economy, is experiencing a threat to its own STEM workforce (Committee on Prospering in the Global Economy of the 21st Century: An Agenda for American Science and Technology, National Academy of Sciences, National Academy of Engineering, Institute of Medicine, 2007). This same report further stated that the population groups that are most underrepresented in STEM, African Americans and Hispanics, are also the fastest growing in the general population of the country. Furthermore, in 2005, most U.S. doctorates in engineering, math, computer science, physics and economics went to foreign citizens as compared to Americans (Urry, 2011). The need for K-12 education reform has also been identified and is required to be addressed on an urgent front by the President of the United States (McPhail, 2011). For the United States to retain its long-enjoyed leadership in science and technology, it should have its own STEM human resources rather than relying on a brain drain from other countries. This situation, therefore, raises a great concern regarding the US's ability to retain and gain from its own STEM talent pool in the near future.

### 2.3 Tackling declining interest in STEM

A federal emergency has been identified, and there is a need to formulate a plan of action and concrete steps in order to re-strengthen United States' position in the global community in the STEM domain (Committee on Prospering in the Global Economy of the 21st Century: An Agenda for American Science and Technology,

National Academy of Sciences, National Academy of Engineering, Institute of Medicine, 2007). This committee advises the US how to increase its K-12 science and mathematics education, making the US the most favorable platform for science and technology advancements and creating high paying jobs.

The first recommendation states that US educational institutions bear the ultimate responsibility to actively participate in the STEM mission to tackle the plummeting American workforce in STEM. It has been reported that fewer than 15% of U.S. high school graduates have the background to pursue college degrees in STEM fields, and fewer still actually do (Urry, 2011). A steering committee at Purdue University recommended that – to improve recruitment into STEM, one should target people from high diversity areas of the country (Simard, 2009 and Weaver, Haghighi, Cook, Foster, Moon, Phegley, & Tormoehlen, 2007). Simard, Stephenson & Kosaraju suggested that the problem of the declining interest in STEM is rooted in the K-12 level (2010). The Committee on Underrepresented Groups and the Expansion of the Science and Engineering Workforce Pipeline has also recommended that improving K-12 awareness activities and counseling for STEM should result in a good number of underrepresented minorities being attracted towards STEM. Study of such literature built a foundation for the consideration of an approach that was used in this current study to cultivate interest in high school students from diverse backgrounds to pursue STEM careers.



## 2.4 Underrepresented minorities in STEM

A behavioral study showed that out of two equally competitive candidates, white talent advances much faster up the corporate and academic ladder than its minority counterparts (Thomas & Gabarro, 1999). Contributing to this problem is the striking underrepresentation of minorities who pursue STEM study, as shown in Figure 2.2 (McCullough, 2002)

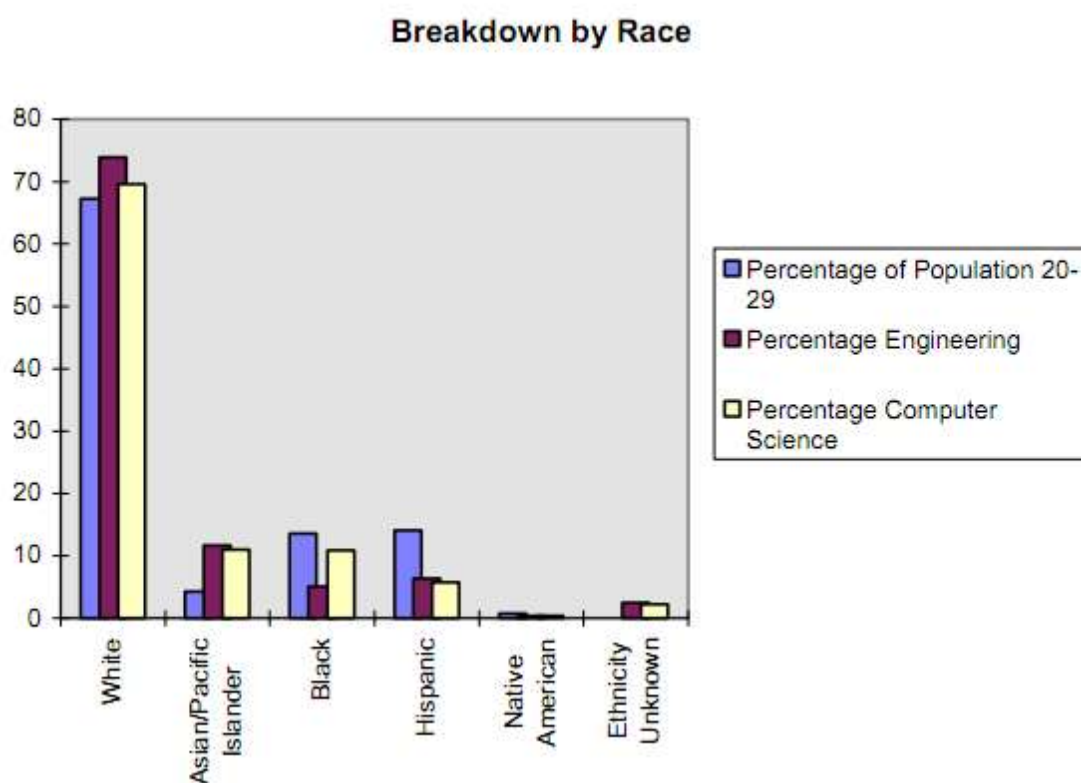


Figure 2.2. Breakdown of STEM enrollment by Race (McCullough, 2002)

Furthermore, there is also an academic achievement gap between white talent and underrepresented minorities in American education institutions (Baskin, 2008).

Women and men from underrepresented minority backgrounds are notably few in

computer science and engineering disciplines, and this gender and minority gap in college further poses a bigger concern over underrepresentation of women and other racial/ethnic minorities in STEM careers (Simard, 2009). The minority gap has become a matter of urgency for the United States because underrepresented minorities constitute a noticeable proportion of the total population, but their representation in STEM has not been significant enough (Nagel, 2008). To highlight one of these inequalities, while African-Americans make up about 15 percent of the population between ages 20 and 24, only about eight percent of STEM degrees are earned by them, according to the National Science Foundation (Chute, 2009). The case is the same for Hispanics. Table 2.1 gives a summarized statistical insight into this problem. Please note that the total number of bachelor's degrees in science and engineering in 2005 was 466,003 on which this data is based.

Table 2.1  
*Race and degrees* (NSF, 2009)

	Number of degrees earned	% of total degrees	Racial group as a % of population, ages 20-24
Whites	301,172	65%	62%
Asians	43,030	9%	4%
Blacks	39,283	8%	15%
Hispanics	35,202	8%	17%
Totals	418687	90%	98%

Underrepresented minorities, thus, mark a vastly available but greatly underused human resource in the United States population. They need to be engaged and retained into the STEM pipeline for the nation to achieve its STEM mission. Also, there has been a positive response to the initiatives of encouraging underrepresented minorities participation in STEM (Targeted News Service, 2009).

### 2.5 Influencing the choice of major by students

A choice of major by a student is linked to various factors by several studies that have been undertaken in the past. Some of these factors include – financial support, matching interest, job prospects, parental guidance and support. As pointed out in a study of distinguishing factors influencing college students' choice of major by Beggs, Bantham and Taylor (2008), the highest-ranked factor that influences the choice of major by high school students is the major matching with the student's interest, which implies a prior understanding of the major based on some information search, research about the major by the student. However, the study also observed that students do not have a significant inclination to search for information on a college major by taking special efforts to visit the university or contact the professors themselves to know more about their research. They look for information that is readily available on college websites, social networks or other admission portals. The clarity, transparency, updating and the element of rapport with prospective students through the university information on its website is of an important value. This fact, along with the aforementioned literature, gives a blueprint for the study at hand to consider tailoring a

school's response to a prospective student's diversity background and customizing it to help the student match his/her interest to a STEM major.

## 2.6 Website Usability

A study of factors influencing the choice of major selection by Crampton, Walstrom and Schambach (2006) indicated that the second ranked factor on the scale of importance when respondents selected their majors was information on the college/department website. The same study indicated that the respondents were more highly informed about accounting, finance, and marketing careers than they were about computer science and information systems. Also, recent studies have indicated that people do not come to the web only for experience but also for information (Gullikson, Blades, Bragdon, McKibbin, Sparling, & Toms, 1999). Hence, there has to be a balance between the design appeal and the information content.

Extending the results from these studies suggests an improvement in the existing Prospective Student module of Department of Computer & Information Technology website to boost the response from prospective students and also make it more informative about the courses and other student centric initiatives at CIT and Purdue University thereby. Personalization of a website also plays an important role in the website user's overall experience and increases chances of return to the website (Wang & Yen, 2010). A user's perceived ease of use and information personalization is of great importance since a careless design increases users' cognitive load and users will avoid using such a feature and/or the website. It is observed that greater levels of

personalized content engender more positive attitudes (Kalyanaraman & Sundar, 2006).

Another important factor for this study is a website's usability and ease of access.

Resources such as Website Evaluation Questionnaire (WEQ) (Elling, Lentz, de Jong, Wimmer, Scholl, & Grönlund, 2007 ), WEBUSE (Chiew & Salim, 2003) quantitatively highlight that the website usability affects the response by its users.

### 2.6.1 Detailed Technological Background

Through the study of literature so far, the emphasis while redeveloping the website was on engaging underrepresented minorities and hence, adding cultural components to the website. One of the technologies used to implement a slideshow that presents different cultural groups at Purdue was AJAX. However, it needed to be removed and an alternate approach to it using CSS was used. This was because AJAX was not supported by the existing server platform where the website is being hosted. Furthermore, the previously existing prospective student website that responded to prospective students needed improvements to migrate from ASP to ASP.NET to keep up-to-date with technological advancements and to customize the responses to student visitors to the portal (A. Harriger, personal communication, August 23, 2011).

From a technological perspective, the study planned to upgrade the old website for prospective students and customize it for research purposes. The availability of the website was dependent on the server where the web application was hosted. There was a possibility of instances of server being unresponsive or down, in which case, the students would have needed to access the website at a later time. The website module

under consideration was not functional for over a year and hence, the subjects of this study needed to access the old website from a temporary server. On a technical front, the research is further limited by the fact that ASP.NET was the primary technology used across the other modules of the website, so there is no comparative study undertaken to consider other competitive tools or technologies.

## 2.7 Choice of Statistical Tests for Data Analyses

Statistical tests were chosen based on what is the type of data being analyzed (CSUN, n.d.). Below is a brief discussion of these tests.

- Chi-square test: a statistical test used to investigate whether distributions of categorical variables differ from one another (Maurer & Pierce, 1998). For questions that yield responses in categories, a chi-square statistic will analyze whether the results exist merely as a chance or if there is any statistically significant reason for a pattern.
- Logistic Regression: form of statistical modeling that is suitable response variable is dichotomous or polytomous, that is, has two or more than two response levels respectively (Stokes, Davis, & Koch, 2000). The response variables can be nominally or ordinally scaled. For the purpose of this research, the analysis focuses on finding main effects for individual response variables along with the interactions between individual variables that significantly contribute to the main response.

- Constant comparison method: This is a method used only for the free form questions for the purpose of this study by employing an approach of categorization of data. Categorizing is a crucial element in the process of such analysis (Dye, Schatz, Rosenberg, & Coleman, 2000 & Dey, 1993). Categorizing gives a direction to patterns that may be hidden in the responses. It does so by identifying objects and ordering classes of events.

## 2.8 Summary

The literature has confirmed that there is a national crisis of declining STEM talent pool. In order to deal with this, US citizens and mainly, underrepresented minorities should be engaged and retained into the STEM pipeline in the same proportion as they exist in the general population. In order to accomplish this goal, this research assessed if there was an impact on the prospective student perceptions of an academic website if they are presented with culturally-personalized answers/information.

## CHAPTER 3 WEBSITE DESIGN AND EVALUATION

The goal of this study was to measure the effectiveness of a student information website that personalized the information presented to prospective student visitors using cultural markers. The efforts involved in this thesis sought to increase interest by diverse students in the programs offered by the college as a way to help support the nationwide mission to boost STEM participation, especially by underrepresented minorities.

### 3.1 Website Design

Website usability is a traditional concept in human-computer interaction and if implemented correctly, cultivates a positive attitude about the website in its user group (Green & Pearson, 2006). Usability can be measured by factors such as efficiency, effectiveness, memorability, satisfaction, learnability and control of errors (Jeng, 2005 and Green & Pearson, 2006). A user's willingness to interact or transact on a website is governed by the basic fundamental needs – Availability, Usability, Confidence and Desire, in the order of their importance to a website user (Chak, 2003). With these needs addressed, there is an increased willingness to interact with the website.



Availability and usability are fundamental to a user's website experience, and based on those a user further forms an opinion and develops confidence and loyalty in the website. Availability refers to the site being reliably up and accessible at all times. This is a performance measure of the server on which the website is being hosted and was considered a given for the purpose of this research.

The efforts involved in this research, therefore, focused on the second important aspect – usability. Usability is defined in terms of ease of use, visual appearance (aesthetics) of a website and its information content. Aesthetics, defined as the study of the mind and emotions in relation to the sense of beauty (Chen, 2009), seems to influence a person's judgment of an entity. The design of a website should aim at creating an appropriate visual layout and 'mood' for the site, also referred to as the aesthetics (Lawrence & Tavakol, 2007). Ease of use refers to the cognitive effort required in using a website (Agarwal & Venkatesh, 2002). It relates to the convenience with which a user can navigate and perform the tasks he/she wants to without much difficulty. Information content refers to the details/data/information being presented to a website user. This information should be brief, useful and up-to-date. Two important subcategories that define information content are – (1) relevance, pertinence of the content to the audience and (2) depth and breadth, detail of topics being presented to a user. These two subcategories form the basis of the personalization to be implemented for this study.

Another important factor to consider in website design is a cultural dimension to the website design and content. Communication – whether it is mass mediated,

interpersonal or nonverbal – is inseparable from culture (Zhao, Massey, Murphy, & Fang, 2010). Hence, an academic website being one of the modes of communication between the department and the prospective student, there has to be significant attention given to including a cultural component on the website.

Some of the other important characteristics to evaluate the usability of academic websites (Olsina et al., 2010) are listed below. In the following sections these are further explained with the help of screenshots, each of them referred to as Usability Attribute with their corresponding numbers in the list:

1. Quality of labeling system
2. Search help
3. Email directory of faculty
4. Comments
5. Level of scrolling
  - 5.1 Horizontal
  - 5.2 Vertical
6. Content relevancy
  - 6.1 Degree/Course offerings
  - 6.2 Scholarship information
  - 6.3 Cultural information
7. Working links
8. News group service

The rest of this section further explains the abovementioned principles in addition to the other references from literature using the screenshots that highlight the significant differences between the two websites (old and new) with the features that were implemented to enhance the usability experience of a prospective student.

A user's experience on a website in terms of its aesthetics also relates to its consistency across pages (Chou, 2002). Figure 3.1 (a) shows the current academics homepage of the website of Department of CIT, and Figure 3.1 (b) shows the first page of the student tracker portion of the website. Figure 3.2 (a) shows the current academics homepage of the department's website, and Figure 3.2 (b) shows the proposed first page of the prospective student portion of the website. Comparing the screen shots in both figures shows how the design of the new website blends better with the rest as compared to the old one in terms of consistent headers and footers, background and color scheme. The regions highlighted on the screenshots show how the new website improves the look and feel of the CIT website.

Another important point to be noted about Figures 3.1 and 3.2 is that the old website calls the form that the student is supposed to complete the CIT Prospective Student Tracker whereas the new one refers it as CIT Information Request Form – which is more appealing to students and not indicating that they're being tracked or monitored for some purpose not stated explicitly (Usability Attribute 1).

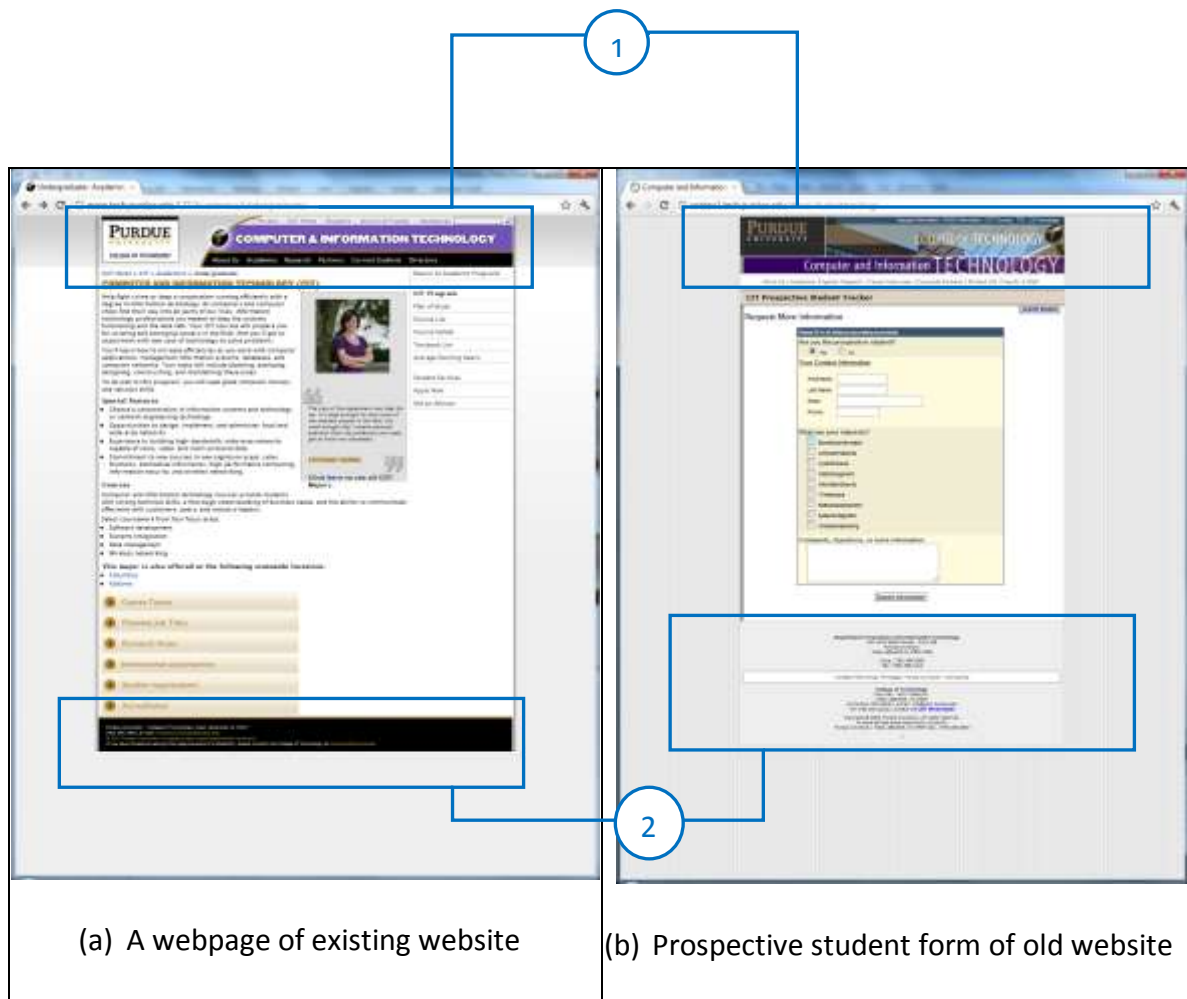


Figure 3.1. Screenshots to compare look and feel of websites

As per the principles of usability and as also highlighted in a study by Davern, Te'eni and Moon (2000), structural quality diminishes in importance with time, and content quality increases in importance. Hence, besides the look and feel of a website, the researcher/designer paid attention to the content, instructions and tone of information personalized for a prospective student, too.

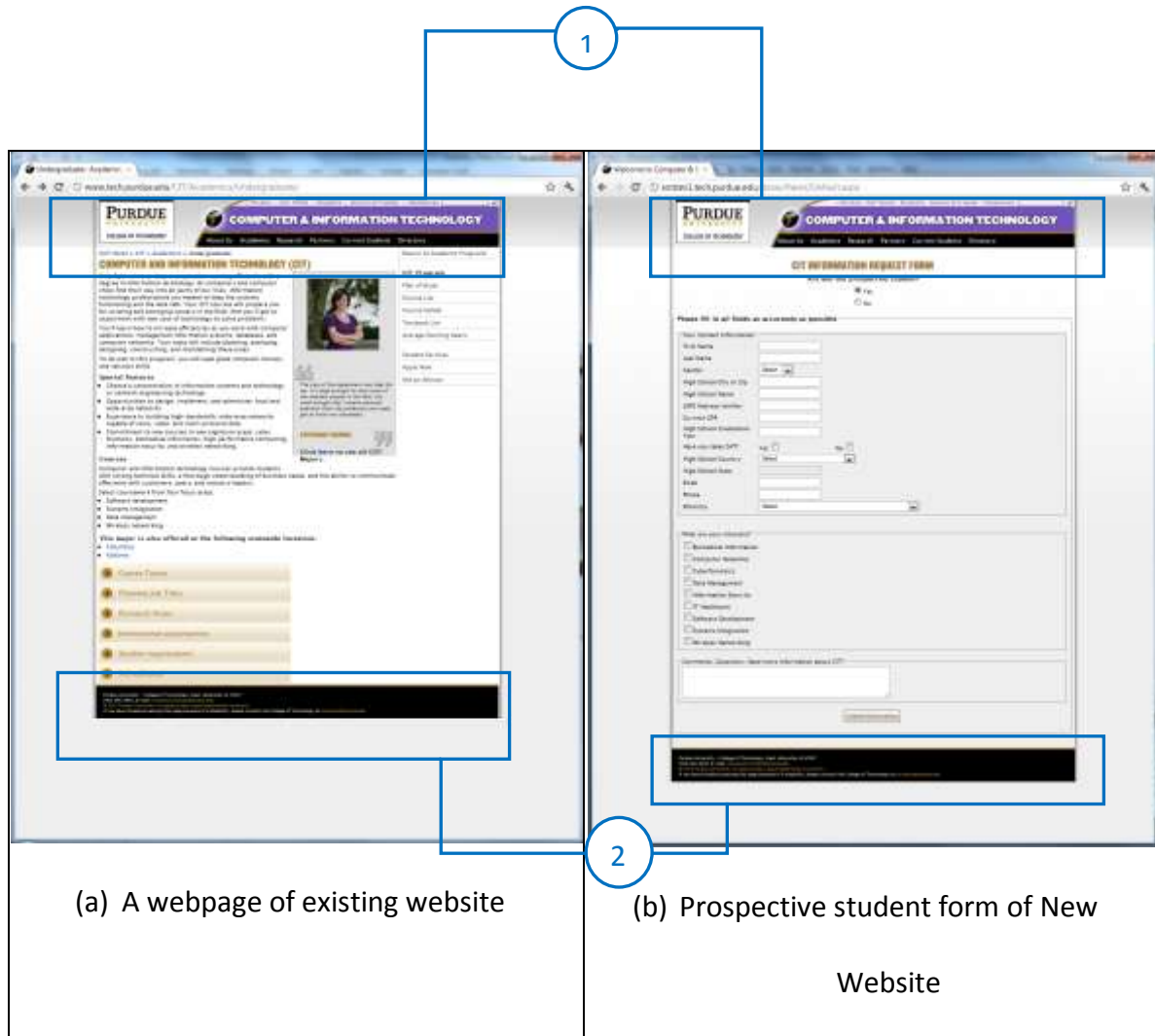


Figure 3.2. Screenshots to compare interface consistency

On the first page that is presented to a prospective student, the new website re-used/exploited the empty space (Schwabe, Rossi, Esmeraldo, & Lyardet, 2001) which was being wasted on the old one by large footers as highlighted in Figure 3.3

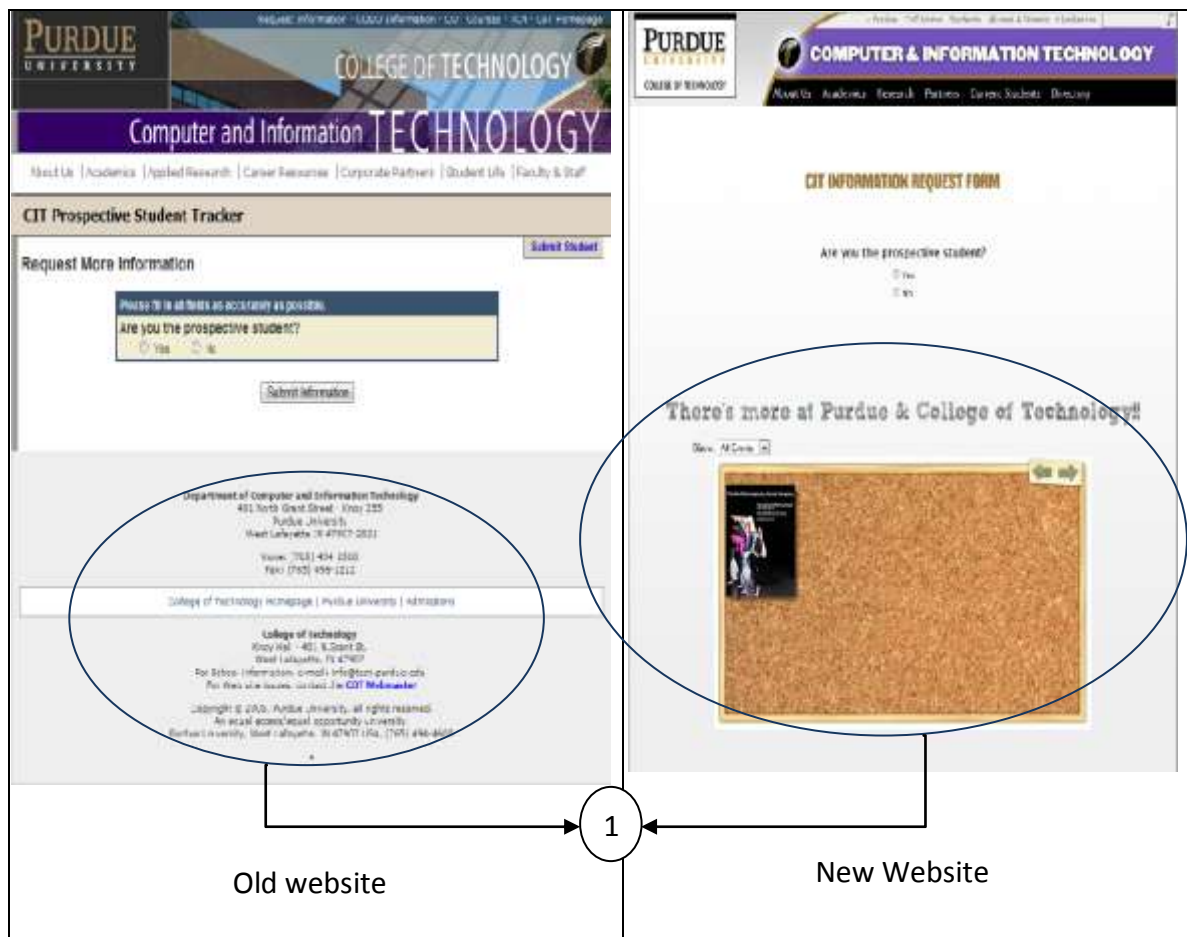


Figure 3.3. Use of free space

Figures 3.4 and 3.5 show before and after implementations of including personalized information in the empty space shown in Figure 3.4, thereby, wisely using the real estate on a webpage.

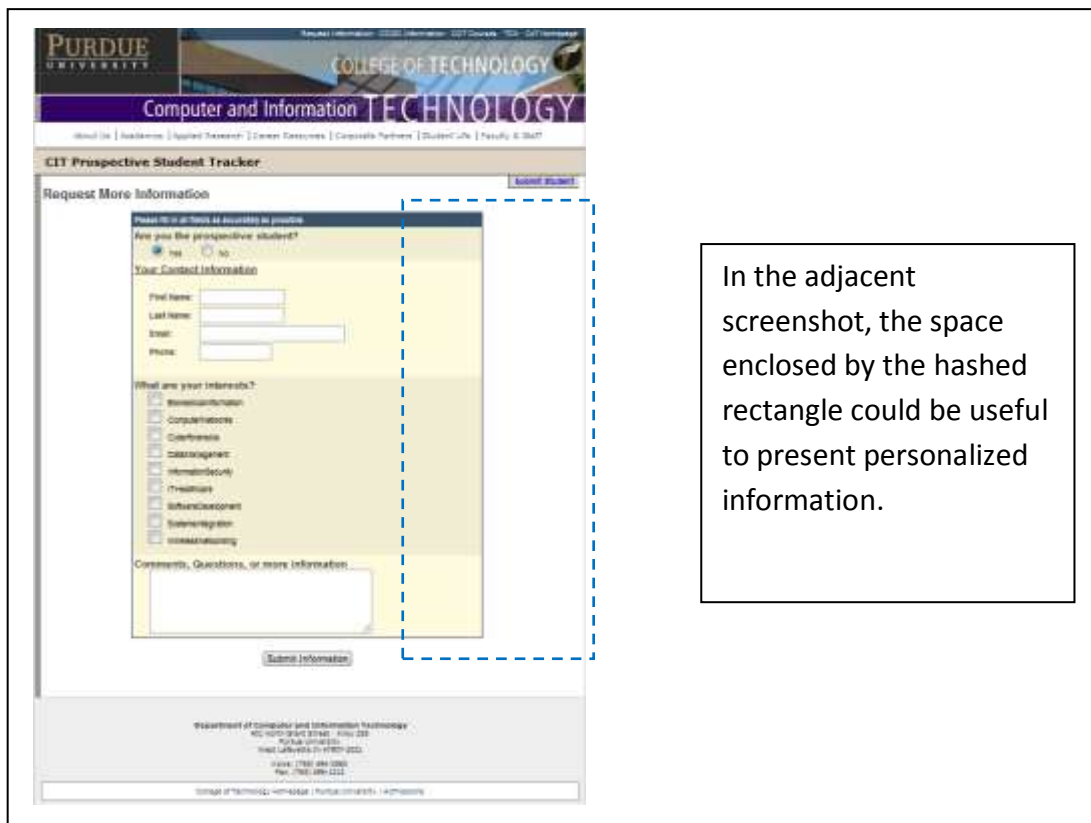


Figure 3.4. Wasting the empty space on old website

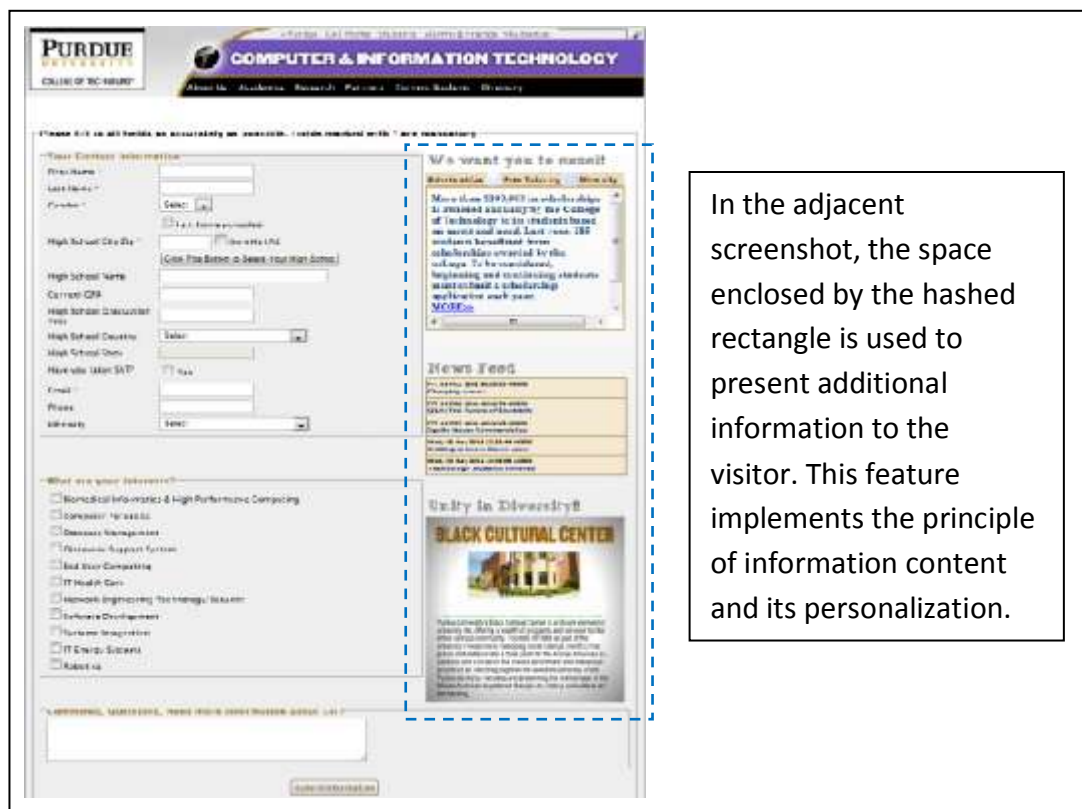


Figure 3.5. Using the empty space on existing webpage

Now, in the highlighted space in Figure 3.5, the redesign effort accommodated as many informative elements as possible. The new design placed usability attributes 2, 6.2, 6.3 and 8 all together in this one place. The design, thereby, also satisfied the attribute of content relevancy. Furthermore, there is a text-area at the bottom of the form to get input/comments from prospective students (usability attribute 4). In addition to this, when a prospective student enters her/his interests by selecting the checkboxes, he/she is also emailed a list of course offerings in a brochure (see appendix A: CIT Info Sheet – 2012.pdf) as well as more information about faculty that share the same area of interest. Part of a sample email is show below in Figure 3.6 and presented in full in the appendix.

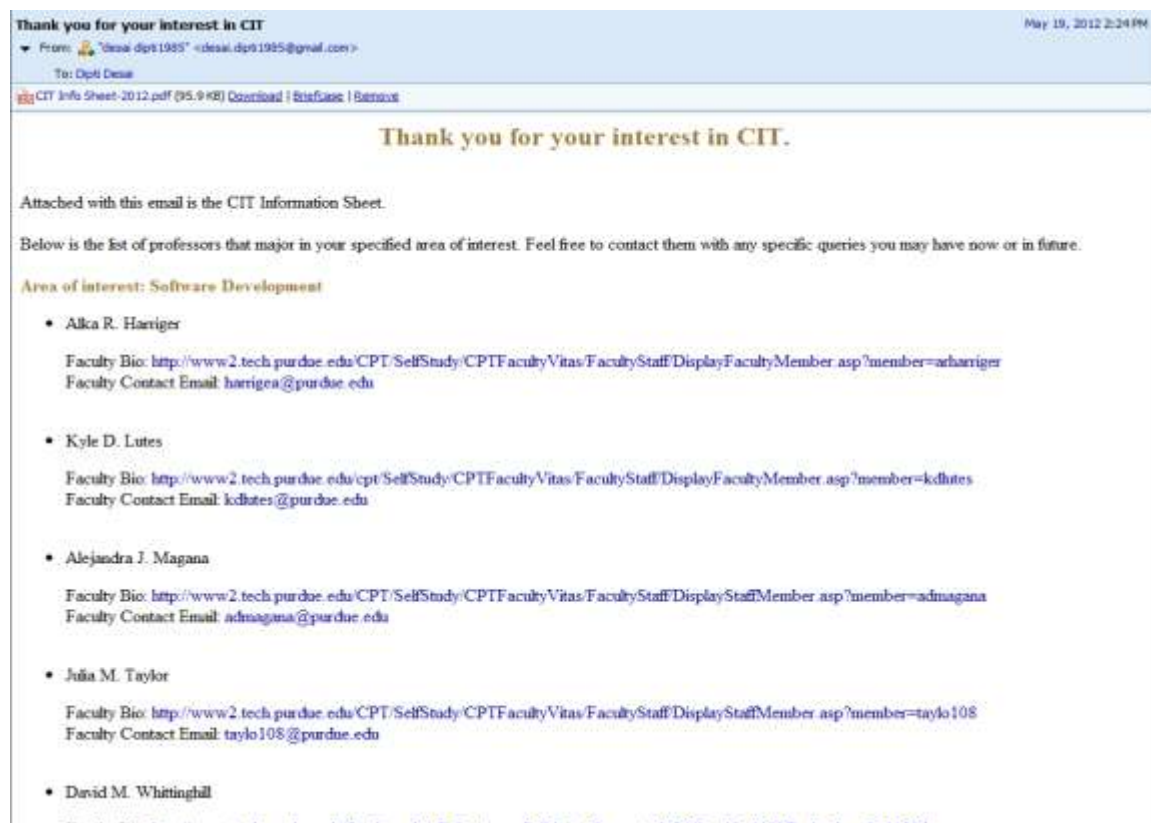



Figure 3.6. Sample email personalized to suit the student's choice of area of interest




If a student mentioned that he/she belonged to an ethnic group which is considered underrepresented, then after submitting the form, he/she gets presented with further information about the cultural activities pertaining to that particular ethnic group at Purdue. This feature incorporated the attribute of cultural markers to personalize information for a prospective student based on his/her ethnicity in addition to the personalization based on choice of interests. It is also expected to help a prospective student get a better idea about a university's attitude toward a multicultural environment (Manning & Coleman-Boatwright, 1991). Figures 3.7(a) and 3.7(b) below help explain how this feature works.

An additional feature provided with the redesigned website was extracting data about the prospective student's demographic background depending on the school he/she is attending. This feature was implemented with the help of the query tool on the website of National Center for Education Statistics (NCES). When provided with minimum information such as zip-code, the query tool shown in Figure 3.8 can provide list of schools, colleges and libraries for a region. In addition to this, it also presents statistics about each school's enrollment by ethnicity/grade etc. This is illustrated in Figure 3.9.



[«Purdue](#)
[CoT Home](#)
[Students](#)
[Alumni & Friends](#)
[Audiences](#)



**COMPUTER & INFORMATION TECHNOLOGY**

[About Us](#)
[Academics](#)
[Research](#)
[Partners](#)
[Current Students](#)
[Directory](#)

Please fill in all fields as accurately as possible. Fields marked with \* are mandatory.

### Your Contact Information

First Name \*

Dipti

Last Name \*

Desai

Gender \*

Female

☒ I am home schooled.

High School City Zip \*

47905

☐ Outside USA

Click This Button to Select Your High School

High School Name

Current GPA

4.0

High School Graduation Year

2007

High School Country

United States

High School State

Indiana

Have you taken SAT?

☐ Yes

Email \*

desai14@purdue.edu

Phone

4241531231

Ethnicity

Native American/Alaskan Native

### We want you to excel!

[Scholarships](#)
[Free Tutoring](#)
[Diversity](#)

More than \$200,000 in scholarships is awarded annually by the College of Technology to its students based on merit and need. Last year, 185 students benefitted from scholarships awarded by the college. To be considered, beginning and continuing students must submit a scholarship application each year.

[MORE>>](#)


### News Feed

Fri, 11 May 2012 20:13:05 +0000	Charging ahead
Fri, 11 May 2012 20:12:54 +0000	Q&A: The Future of Electricity
Fri, 11 May 2012 20:11:06 +0000	Ignite ideas: Commercialize
Wed, 02 May 2012 13:21:44 +0000	Getting to know Dawn Laux
Wed, 02 May 2012 13:19:03 +0000	Technology students honored

### What are your interests?

☐ Biomedical Informatics & High Performance Computing
 ☐ Computer Forensics
 ☐ Database Management
 ☐ Discovery Support System
 ☐ End User Computing
 ☐ IT Health Care
 ☐ Network Engineering Technology/Security
 ☒ Software Development
 ☐ Systems Integration
 ☐ IT Energy Systems
 ☐ Robotics

### Unity in Diversity!!



### Comments, Questions, Need more information about CIT?

Submit Information

Figure 3.7(a). Personalization based on ethnic background – step 1 – student submits the form

The screenshot displays the Purdue University Computer & Information Technology website. The top navigation bar includes links for «Purdue», CoT Home, Students, Alumni & Friends, and Audiences. The main header features the Purdue University logo and the text «PURDUE UNIVERSITY COLLEGE OF TECHNOLOGY». Below this, a purple banner reads «COMPUTER & INFORMATION TECHNOLOGY» with sub-links: About Us, Academics, Research, Partners, Current Students, and Directory.

A central message states: «WE APPRECIATE YOUR INTEREST IN COMPUTER & INFORMATION TECHNOLOGY! THANK YOU!!» followed by: «You will shortly receive an email with the contact information of professors in The Department of Computer & Information Technology that have a matching area of interest as yours.»

Below this, a link invites users to «Check out the Native American Educational & Cultural Center at Purdue!». This section features the Purdue University logo, the title «Native American Educational and Cultural Center», a Google Custom Search bar, and social media icons for Facebook, Twitter, and Email. A navigation bar lists: About, Student Organizations, Programs, Partnerships, Resources, Gallery, and Calendar.

The main content area shows a group photo of students and faculty sitting on a rocky ledge in a desert landscape, holding a large «P» sign. Below the photo, a section titled «There's more at Purdue & College of Technology!!» includes a «Show: All Events» dropdown menu and a corkboard graphic with a small image of a dance performance.

Figure 3.7(b). Personalization based on ethnic background – step 2 – information in the top panel is personalized based on the student's mentioned ethnicity

**ies** INSTITUTE OF EDUCATION SCIENCES

**NATIONAL CENTER FOR EDUCATION STATISTICS**

Enter search terms here

Publications & Products | Surveys & Programs | Data & Tools | Fast Facts | School Search | News & Events | About Us

### Search for Schools, Colleges, and Libraries

State  City

Zip  Distance  Miles from Zip

Name

Sort by ☒ Name ☐ State ☐ City

[Browse For City](#)

**Institutions**  
select any of interest [\(all\)](#)

Public Schools ☐

Private Schools ☐

Colleges ☐

Public Libraries ☐

*Figure 3.8* National Center for Education Statistics Web Tool

The redesigned website used the query tool on the NCES website to inform the Department of CIT of a prospective student's background as it related to the population at the student's school. This was achieved by providing a link in the email to the department website admin and to the diversity office of outreach programs, as shown in Figure 3.10, that a prospective student contacted CIT. This link redirects to a webpage similar to Figure 3.9 and provides statistics about the student's school.

Once the email is received, the department admin/coordinator may then choose to follow up with the student and/or also consider this for statistical reporting by categorizing diverse backgrounds from which students approach the Department of CIT. The work-flow of this task is as described below:

1. The student user enters the zip code on the web form of the re-developed website.

2. The re-developed web tool contacts the query engine on NCES website to pull the required statistics and information.
3. The web tool constructs and provides a link in the email, as show in Figure 3.10.

The email informs the departmental coordinator about a prospective student who is currently enrolled at a school with certain student population attributes of interest, including ethnic diversity. After reviewing the information, the coordinator may complete other appropriate actions, such as sending the student a targeted follow-up message.

The idea behind this system was that such information about a student could be used to understand the background a student comes from and help the department better personalize its response to him/her. For example, if a Caucasian student attended a school that had a large ethnic diversity, then his/her experiences of working with a diverse group might enable the department and/or diversity office to find better ways of engaging all students in their diversity initiatives. As another example, if a student comes from a school that has a considerable proportion of students receiving free or reduced lunches, then he/she may be more likely to be in need of financial aid. This information can help the department personalize its response to such a student by including additional information about scholarships, funding opportunities etc.

Secondly, with such a design, the college's diversity office can keep better track of varied backgrounds of students for maintaining statistics and more importantly better structuring their outreach programs to target under-represented minority populations.

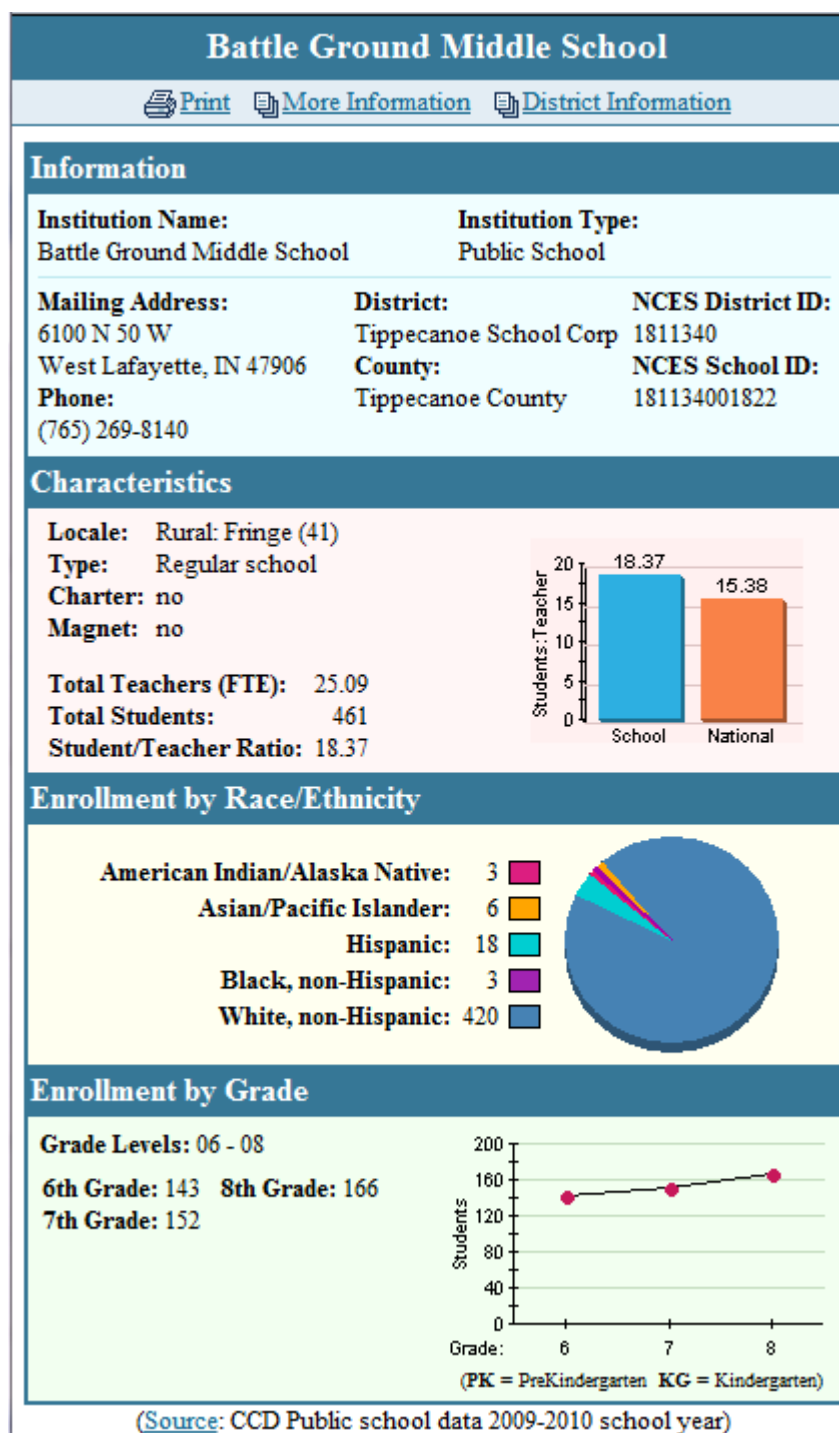
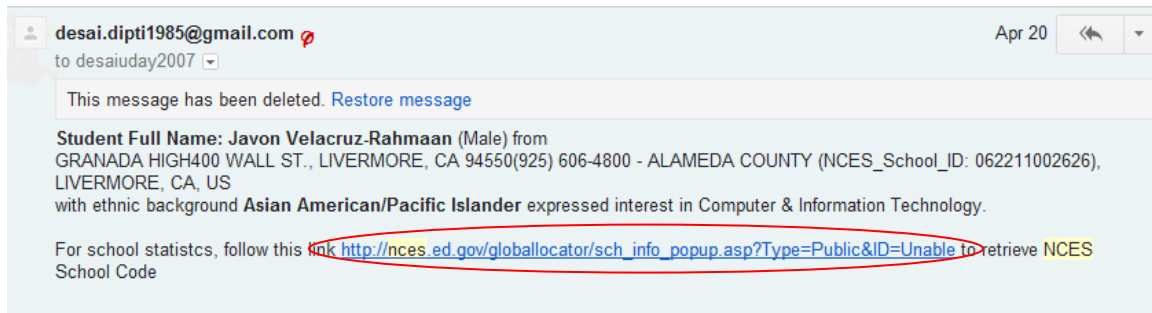


Figure 3.9 Illustration of web tool on NCES website



*Figure 3.10* Sample email to CIT department coordinator illustrating

NCES query tool link in email (highlighted in red)



## CHAPTER 4 STUDY DESIGN AND EVALUATION

### 4.1 Data Collection Procedure

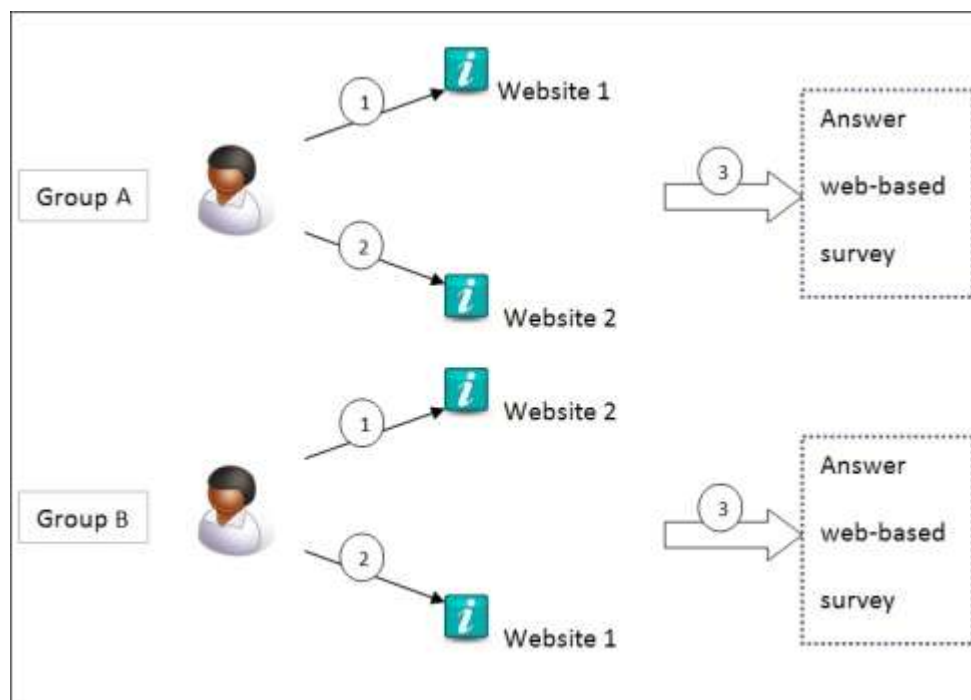
The targeted participants for this study were students at Purdue University. In order to make the sample statistically significant, the number of participants targeted was 100. A comparative usability evaluation of the websites was carried out by having all subjects visit both websites – old and new -- in any order. During this experiment, participants also reported if they faced any usability errors and rated their severity. They also briefly suggested if they thought of other features to add to make the redesigned website more useful.

The permission to visit the labs to survey students was obtained by personally meeting with the instructor – Guity Ravai. Prof. Ravai approved the use of 15 minutes of total lab time in selected labs to conduct the study. The links to the survey were shortened using Google URL Shortener and made ambiguous for discouraging participants to remember links and allowing unauthorized access outside lab sections resulting into misleading data. The respective links for the two websites were posted onto the course management tool (Blackboard) used by the instructor. This facilitated quick and authorized access to the websites and survey questionnaire. The survey links



were active on Blackboard only for the duration of the survey administration and were deactivated and made hidden shortly after the survey was conducted.

Figure 4.1 illustrates the process for the randomized experiment on selected group of students that visited the two websites and then answered the survey.



*Figure 4.1. A comparative usability evaluation work-flow*

The subject pool for this experiment was divided approximately in two halves and each of the two groups were presented the two websites in two different orders as depicted in the Figure 4.1. Table 4.1 denotes the setting in which particular groups were surveyed:

Table 4.1  
*Survey Administration*

Code for Order of Presentation	Date survey was administered	First website	Second website
Order A	Monday, April 16, 2012	Re-developed website	Old website
Order B	Thursday, April 19, 2012	Old website	Re-developed website
	Friday, April 20, 2012	Old website	Re-developed website

#### 4.1.1 Institutional Review Board (IRB)

Another important aspect of this study was the interaction and surveying of human subjects. The university's Institutional Review Board (IRB) reviewed the study protocol to ensure all rules are followed. An IRB approval (Protocol # 1111011557) was obtained for the initial version of the survey instrument on December 2, 2011. However, because of the changes to the survey instrument in order to suit the requirements of the revised study, an amendment to the approved study was submitted on April 2, 2012, and was approved on April 13, 2012. The approved protocol and amendment are attached in the appendix D. The surveys were administered during the week of April 16, 2012, during the lab sections of pre-approved classes. For the purpose of administering surveys for this study, IRB required:

1. Instructor's permission for the classes being surveyed – this was obtained by personally meeting with the instructor(s) (Guity Ravai), explaining the purpose of this study and obtaining permission to survey the class during lab sections for the online nature of this survey instrument.

2. Researcher cannot survey the subjects that he/she is directly an instructor or teaching assistant (TA) for.
3. Making the subjects/participants fully aware that they are free to deny taking this survey without any penalty
4. Have the instructor step out of the lab/class so as not to have any influence on students' choice of taking or opting out of the survey.

#### 4.2 Data Collection Instrument

The survey was framed to contain both closed and open-ended questions. The online tool used for administering surveys was Qualtrics. Responses to the survey questionnaire were analyzed to determine if students think that personalized information by the school to prospective students would be helpful and enhance the usability of the website. The questionnaire asked students if they think that when presented with responses that support an effort by the school to respect its pupils' diversity, would they be more willing to visit again and use and recommend such a website to their peers. Responses to objective type questions were evaluated quantitatively using a statistical model. However, responses to open ended questions were analyzed using qualitative method of analysis and also implemented in code (e.g. please briefly list any features that you feel would enhance the usability of Website 1, if any).

The literature has shown that forcing responses to a question increases the likelihood of invalid data (Kaczmirek, 2005). Hence, apart from the disclaimer presented

prior to the survey regarding the participant's choice in taking the survey, all the other questions were optional. The instrument also contained psychometric response scale questions – Likert Scale questions used to gauge a participant's degree of agreement with a statement or set of statements. These questions were answered on a 5 point scale starting from Strongly Agree, Agree, Neither Agree Nor Disagree, Disagree, and Strongly Disagree.

The survey instrument is presented in Appendix E. Some of the questions in the survey instrument were adapted from the literature available online to develop a usability instrument based on ISO standards (Green & Pearson, 2006). The survey also used resources that talk about practical and theoretical developments to interactive websites and related media (Olsina, Godoy, Lafuente, & Rossi, 2010). Appendix C contains screenshots of the survey to better understand how the web survey tool – Quatrics presented the survey.

#### 4.2.1 Validity and Reliability of the Instrument

Researcher bias and distortion question the validity and reliability of a survey instrument (Yang, Cai, Zhou, & Zhou, 2005). Reliability conforms to the consistency of the survey questionnaire (Pinellas School District, & the Florida Center for Instructional Technology, 2012). Answers testing a respondent's knowledge on a particular concept are expected to be consistent. For example, for this study, this refers to a scenario that if a participant answers one of the items in favor of a re-designed website, then the researcher should be able to assume that other, similar items are on a positive note for

that particular website, too. The survey questionnaire implements questions accounting for reliability of the instrument.

Validity of an instrument refers to the validity of content, criterion and constructs (Litwin, 1995). The survey instrument at hand implements content and construct validity. The content validity is satisfied in a way that the questionnaire asks questions that match with the objective of a comparative study of two websites. On the other hand, for construct validity, it considers other variables playing a role in determining better website of the two; such as – ease of navigation, encountering errors etc., which appear in literature and are expected to be important to a website user.

## CHAPTER 5 DATA ANALYSIS

The sample size for this study was 115. Although there could be no ethnic classification obtained from the Office of the Registrar, Purdue University, 33% of the students were reported to be minorities as a percentage of total. The data analysis for this sample was carried out in two separate ways. This was because the responses to the survey were answers to both multiple choice and open ended questions. Responses to objective questions were analyzed quantitatively by a chi-square test/logistic regression. Whereas, responses to open ended question were accommodated in the development/coding of the website. Sample SAS scripts to generate these statistical reports have been supplied in the appendix. Table 5.1 shows the distribution of respondents.

### 5.1 Preparing Data for Analysis

The data obtained from the survey tool Qualtrics was in the raw form and hence, needed to be cleaned and prepared for analysis (Wolcott, 1994). Table 5.2 lists the data fields present in the originally downloaded response files.

Table 5.1

*Survey Administration with Sample Sizes*

Code for Order of Presentation	Date survey was administered	First website	Second website	Number of respondents
Order A	Monday, April 16, 2012	Re-developed website	Old website	63
Order B	Thursday, April 19, 2012	Old website	Re-developed website	34
	Friday, April 20, 2012	Old website	Re-developed website	32

Table 5.2

*Raw Data Fields*

ResponseID	ResponseSet	Name
ExternalDataReference	EmailAddress	IPAddress
Status	StartDate	EndDate
Finished	Q1 (Pre-survey element 1 from Appendix E)	Q2 (Pre-survey element 2 from Appendix E)
Q3 through Q9 (a data field per question for questions from Appendix E)		

The steps carried out for data cleansing and preparation were:

1. Separate the responses to open ended questions for the analysis of objective questions.
2. The data collected were in separate files according to the date and time of the lab sections when the survey was administered. Hence, the first step is to combine all the data in one whole data chunk.

While combining the data, care is taken to code the order of presentation of websites depending on which website was presented first. Another data field named 'OrderPresntn' is added to the dataset to denote this order. The order of presentation is coded as:

- A: for groups presented with the re-developed (new) website first and then the old one
  - B: for groups presented with the old website first and then the re-developed (new)
3. Table 5.3 categorizes the data fields according to their relevance to the analysis at hand.

Table 5.3  
*Categorization of Data Fields*

Data fields Useful for Analysis	Data Fields Unwanted for Analysis
Q3 through Q9 (a data field per question for questions from Appendix E) for which the data field 'Finished' is 1	ResponseID
	ResponseSet
	Name
	ExternalDataReference
	EmailAddress
	IPAddress
	Status
	StartDate
	EndDate
	Q1 (Pre-survey element 1 from Appendix E)
	Q2 (Pre-survey element 2 from Appendix E)

4. There was one remaining data field which was included as part of the survey, and it contained the disclaimer for participants. This needs to be removed as it doesn't account for a data value to be analyzed. The heading for this column read as 'Purpose of Research / The purpose of this research is to evaluate the usefulness and usability of a we...'



5. Responses to questions that have been seen but not answered were coded as - 99 in the dataset downloaded from Qualtrics. However, in order to use the statistical tools on this dataset, these missing values were re-coded as '.' (Dot) in the final dataset to be analyzed. Missing values in datasets are denoted by a '.' (Dot) in SAS analysis.
6. The responses to Likert Scale questions were re-coded to make the data consistent in order to be analyzed using standard statistical tests discussed further. Recoding was necessary because the two websites were presented in different orders to students, causing the responses to have been mixed up between the two groups who were presented the sites in two different orders. For example, website 1 referred to the re-developed website for a student from group with Order A whereas the same referred to the previously existing website for the other group with Order B. Hence, pre-processing was required on the data to allow the researcher to refer to the old site and the new site consistently for analysis.

## 5.2 Choice of Statistical Tests

Categorical variables yield data in categories, e.g. yes/no, male/female. For an example pertaining to the study at hand, for questions 1 and 2 from Appendix E, the responses could either be yes or no and website 1 or website 2, respectively. The response, thus, falls in one of the two categories. This research used two statistical tests already discussed in literature review to analyze different sets of questions.

Also, further observing questions from Appendix E, questions numbered 3 through 19 were answered on a psychometric Likert Scale. Data obtained from such responses is discrete/not continuous and hence, cannot be analyzed using statistical tests that operate on means. The Likert scale records the opinions and attitudes of students and hence, the researcher cannot be certain that participants view the difference between 'agree' and 'strongly agree' the same way as they view the difference between 'agree' and 'neutral' (Bertram, 2007). These responses were, therefore, analyzed using logistic regression method of statistical modeling.

### 5.3 Data Analysis – Quantitative

This section presents analysis of every question in the questionnaire and thereafter deduces the results. For the rest of this section, the questions are numbered serially along with their respective question IDs/data fields in the raw data downloaded from Qualtrics. Likert Scale responses were answered on a 5 point scale from Strongly Agree, Agree, Neither Agree Nor Disagree, Disagree, and Strongly Disagree.

Question 1 (Data Field Q3): Did you find any difference in the two websites presented to you?

Explanation: This question was used to assess if there was any perceived difference between the two websites regardless of the order of presentation. The codes for YES and NO in the downloaded Qualtrics dataset were 1 and 2, respectively.

Table 5.4

*Chi-square table of two-way frequencies*

Frequency Percent Row Pct Col Pct		Order of Presentation		
Q3	1	0	1	Total
		52	52	
		46.43	46.43	104
		50.00	50.00	92.86
		96.30	89.66	
	2	2	6	
		1.79	5.36	8
		25.00	75.00	7.14
		3.70	10.34	
	Total	54	58	112
		48.21	51.79	100
Frequency Missing = 3				

Table 5.5

*Chi-square table of one-way frequencies*

Q3				
Q3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	104	92.86	104	92.86
2	8	7.14	112	100.00

Table 5.6

*Chi Square Test for Equal Proportions*

Chi-Square	82.2857
DF	1
Pr > ChiSq	< .0001
Frequency Missing = 3	

Analysis: Results of the chi-square test are shown in Tables 5.4, 5.5 and 5.6. From Table 5.4, one can see that 46.53% of the participants, when presented websites in Order A (new followed by old); found there was a perceivable difference between the two.

Similarly, 46.53% of the participants, when presented websites in Order B (old followed by new); found there was a perceivable difference between the two. From Tables 5.5 and 5.6, results of one-way frequency chi-square test show that 92.86% participants have identified difference between the two websites, regardless of their order of presentation. This is further confirmed by the significance of the chi-square test shown in Table 5.6.

Conclusion: A statistically significant proportion of subjects perceived a difference between the two websites presented to them.

Question 2 (Data Field Q4): Which website, in your opinion, is better at doing its job to interact with prospective students?

Explanation: This question asked the participants' opinions about what they thought about a website serving its intended purpose of being useful to prospective students.

Analysis: The results of the statistical test are shown in Tables 5.7 and 5.8. They point out that when the old website was presented first followed by the new website (Order B), 40.35% of the participants perceived the new website to be better from the points of view of prospective students, compared to the old one. On the other hand, when the new website was presented first followed by the old one (Order A), 38.60% of the participants found the new one to be better. This is further confirmed by the significance of the chi-square test shown in Table 5.8. Hence, 78.95% of the sample considers the re-developed website was better in comparison to the previously existing one. There is 90% confidence that these results have not occurred solely by chance.

Table 5.7  
*Chi-square test for question 2*

Frequency	Percent	Order of Presentation		
Row Pct	Col Pct	0	1	Total
Q4	1	44	13	
		38.60	11.40	57
		77.19	22.81	50.00
		80.00	22.03	
	2	11	46	
		9.65	40.35	57
		19.30	80.70	50.00
		20.00	77.97	
	Total	55	59	114
		48.25	51.75	100.00
Frequency Missing = 3				

Table 5.8  
*Chi-square statistic for question 2*

Statistic	DF	Value	Prob
Chi-Square	1	38.2576	< .0001

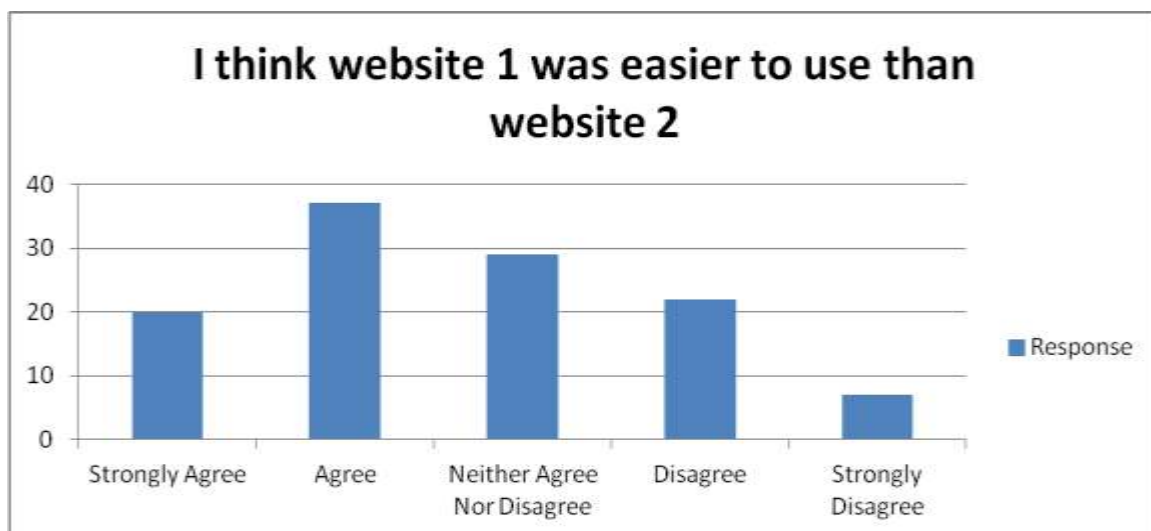
Conclusion: The re-developed website is more effective in doing its job as a prospective student website than the previously existing one. It is perceived better than the old one by the respondents.

Question 3 (Data Field Q5\_1): I think website 1 was easier to use than website 2

Explanation: This question tried to answer, from a prospective student website visitor's point of view, if the re-designed website was able to be used without much difficulty.

Analysis: Figure 5.1 shows the plots of counts for different categories of ordinal responses.

Table 5.9. shows the results of the main effects model of logistic regression to examine if this response to assessing “ease of use” factor of either of the two websites has any statistically explanatory power for a participant picking that particular website for question 2 – which website, in your opinion, is better at doing its job to interact with prospective students. This, in turn, will help analyse factors/elements that had statistically significant power to explain a participant choosing a particular website to be better than another.



*Figure 5.1.* Counts for categorical response variable for question 3

Table 5.9  
*Logistic regression for question 3*

Summary of Forward Selection						
Step	Effect Entered	DF	Number In	Score Chi-Square	Pr > ChiSq	Variable Label
1	Q5_1	1	1	19.8323	< .0001	Q5_1

The results denote that the variable “ease of use” is statistically significant, to a significance level of 0.001, to a participant evaluating a particular website to be better in question 2. In other words, ease of use is one of the significant factors that can be attributed to a participant choosing a website to be better in response to question 2.

Conclusion: Ease of use plays a significant role in deciding if the re-developed website is better than the old one.

Question 4 and 5 (Data Field Q5\_2 and Q5\_3): I would recommend website 1/website 2 to a friend/relative.

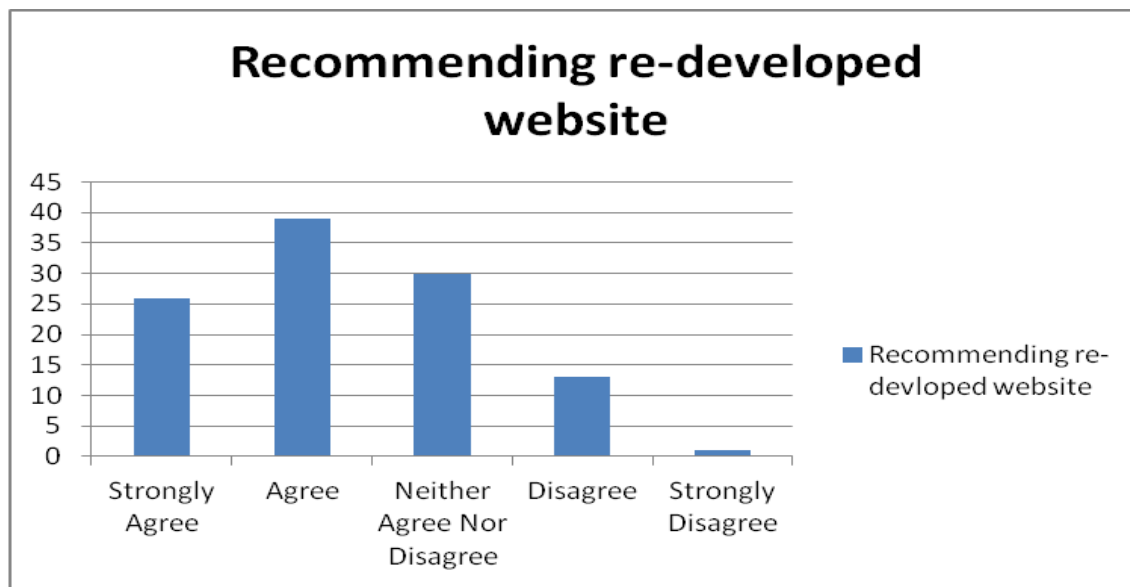
Explanation: These were paired questions and attempted to understand a student’s opinion if a website could be suggested to someone else.

Analysis: Figure 5.2 illustrates distribution of attitudes of respondents. 60% of the participants indicated that they find the re-developed website to be worthy of recommending to others.

Conclusion: The re-developed website was perceived to be worthy of recommending to others by the respondents.

Question 6 (Data field Q5\_4): I feel Website 1 was more frustrating to use than website 2.

Explanation and Analysis: This is a paired question with question 3. The analysis of responses is in agreement with the the one for question 3.



*Figure 5.2. Distribution of participants recommending re-designed website*

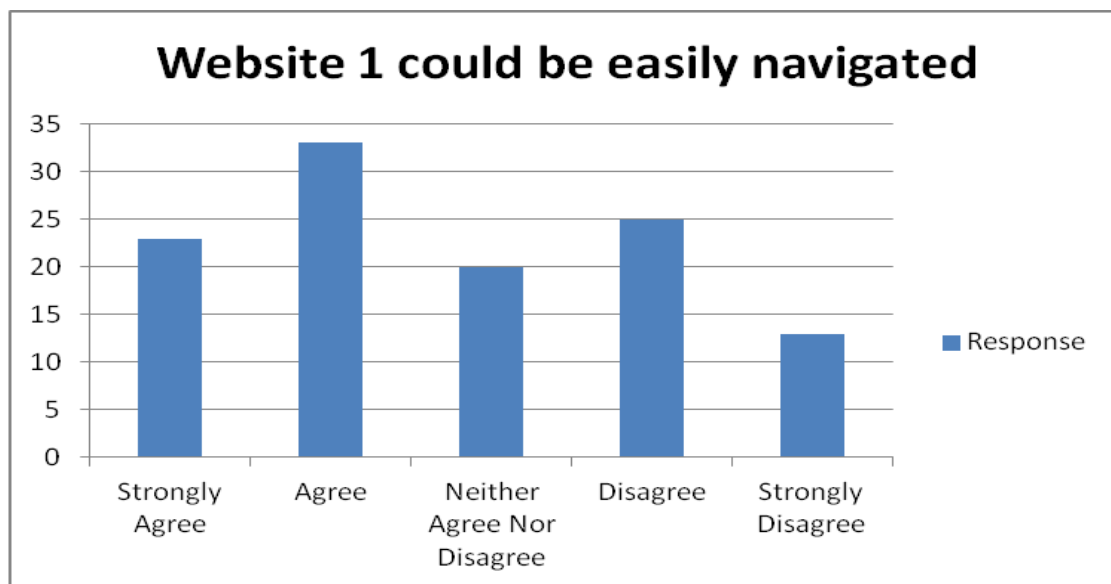
Conclusion: Ease of use thereby, plays a significant role in deciding if the re-developed website is better than the old one.

Question 7 (Data Field Q5\_5): Website 1 could be easily navigated.

Explanation: This question assessed, from a prospective student website visitor's point of view, if incorporating an element of easy navigation could have had any explanatory power on choosing one website over another as a better one in response to question 2.



Analysis: Figure 5.3 shows the plots of counts for different categories of ordinal responses.



*Figure 5.3.* Counts for categorical response variable for question 7

Table 5.10. shows the results of the main effects model of logistic regression to examine if this response to assessing “ease of navigation” factor of any of the two websites has any statistically explanatory power for a participant picking that particular website for question 2 – which website, in your opinion, is better at doing its job to interact with prospective students. This, in turn, will help analyse factors/elements that had statistically significant power to explain a participant choosing a particular website to be better than another.

Table 5.10  
*Logistic regression for question 7*

Summary of Forward Selection						
Step	Effect Entered	DF	Number In	Score Chi-Square	Pr > ChiSq	Variable Label
1	Q5_5	1	1	7.5010	0.0062	Q5_5

The results denote that the variable 'ease of navigation' is statistically significant, to a significance level of 0.05, to a participant evaluating a particular website to be better in question 2. In other words, ease of navigation is one of the significant factors that can be attributed to a participant choosing one website to be better in response to question 2.

Conclusion: Ease of navigation plays a significant role in deciding if the re-developed website is better than the old one.

Question 8 (Data Field Q5\_6): Website 2 is more visually appealing than Website 1

Explanation: This question considered, from a prospective student website visitor's point of view, if incorporating an element of visual appeal could have had any explanatory power on choosing one website over another as a better one in response to question 2.

Analysis: Figure 5.4 shows the plots of counts for different categories of ordinal responses.

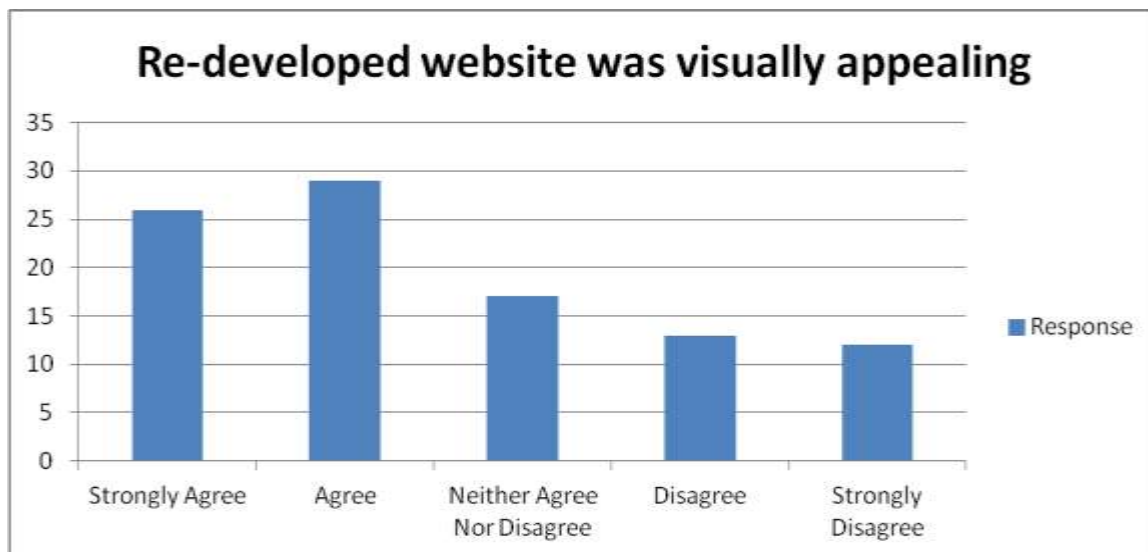


Figure 5.4. Counts for categorical response variable for question 8

Table 5.11. shows the results of the main effects model of logistic regression to examine if this response to assessing “visual appeal” factor of any of the two websites has any statistically explanatory power for a participant picking that particular website for question 2 – which website, in your opinion, is better at doing its job to interact with prospective students. This, in turn, helped analyse factors/elements that had statistically significant power to explain a participant choosing a particular website to be better than another.

Table 5.11

*Logistic regression for question 8*

Summary of Forward Selection						
Step	Effect Entered	DF	Number In	Score Chi-Square	Pr > ChiSq	Variable Label
1	Q5_6	1	1	5.5203	0.0188	Q5_6

The results show that the variable 'visual appeal' is statistically significant, to a significance level of 0.05, to a participant evaluating a particular website to be better in question 2. In other words, visual appeal is one of the significant factors that can be attributed to a participant choosing a website to be better in response to question 2.

Conclusion: Visual appeal plays a significant role in deciding if the re-developed website is better than the old one.

Question 9 (Data Field Q5\_7): Website 1 interface was more consistent compared to Website 2

Explanation: This question considered, from a prospective student website visitor's point of view, if incorporating an element of visual consistency could have had any explanatory power on choosing one website over another as a better one in response to question 2.

Analysis: Figure 5.5 shows the plots of counts for different categories of ordinal responses.

Table 5.12. shows the results of the main effects model of logistic regression to examine if this response to assessing "consistent interface" factor of any of the two websites has any statistically explanatory power for a participant picking that particular website for question 2 – which website, in your opinion, is better at doing its job to interact with prospective students. This, in turn, will help analyse factors/elements that had statistically significant power to explain a participant choosing a particular website to be better than another.

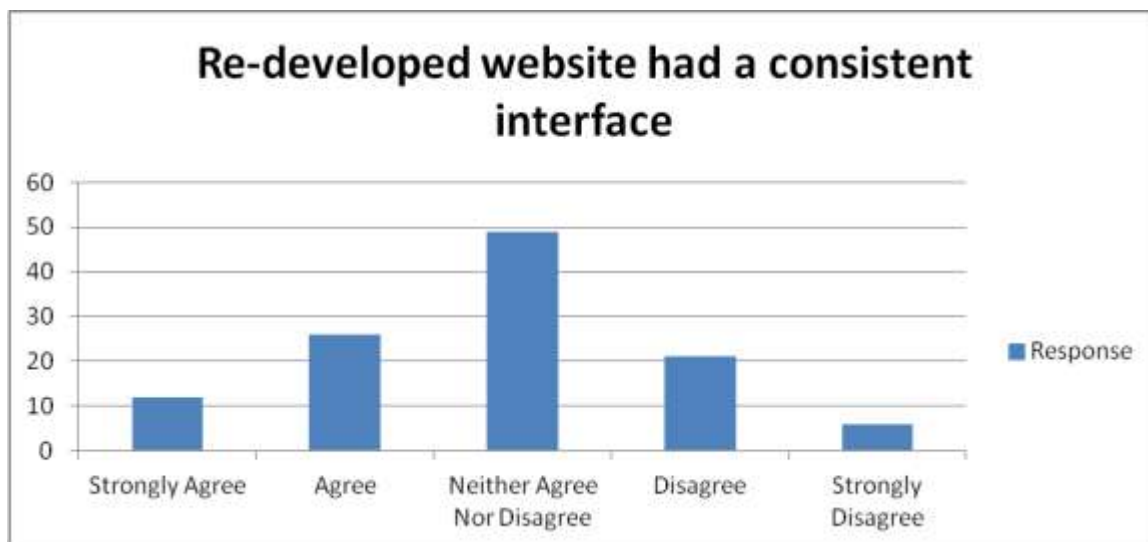


Figure 5.5. Counts for categorical response variable for question 9

Table 5.12

*Logistic regression for question 9*

Summary of Forward Selection						
Step	Effect Entered	DF	Number In	Score Chi-Square	Pr > ChiSq	Variable Label
1	Q5_7	1	1	7.9300	0.0049	Q5_7

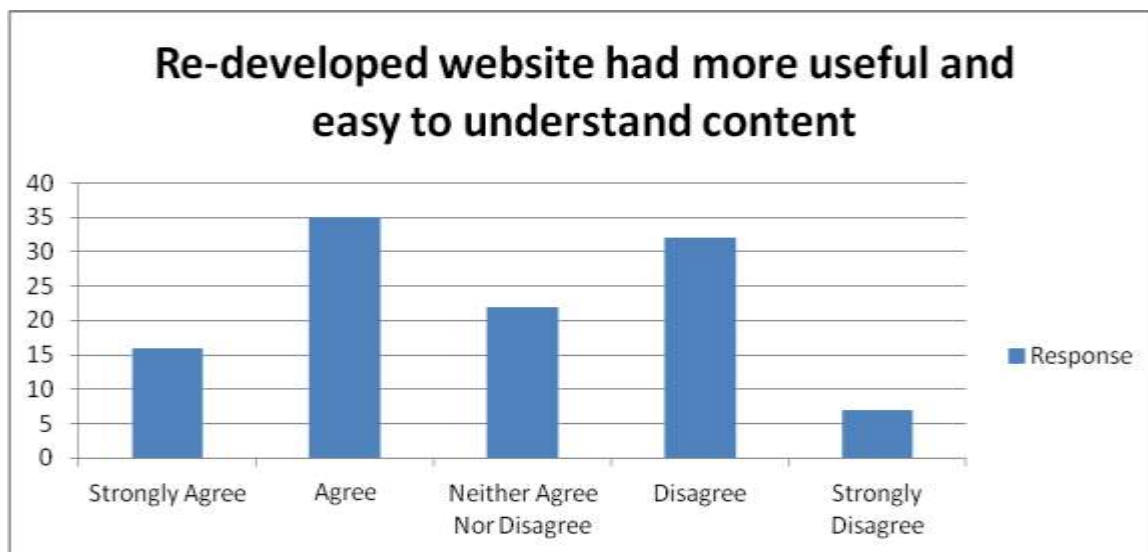
The results show that the variable 'interface consistency' is statistically significant, to a significance level of 0.005, to a participant evaluating a particular website to be better in question 2. In other words, interface consistency is one of the significant factors that can be attributed to a participant choosing a website to be better in response to question 2.

Conclusion: Interface consistency plays a significant role in deciding if the re-developed website is better than the old one.

Question 10 (Data Field Q5\_8): The information provided on Website 1 was useful and easy to understand.

Explanation: This question considered, from a prospective student website visitor's point of view, if incorporating an element of content usefulness could have had any explanatory power on choosing one website over another as a better one in response to question 2.

Analysis: Figure 5.6 shows the plots of counts for different categories of ordinal responses.



*Figure 5.6.* Counts for categorical response variable for question 10

Table 5.13. shows the results of main effects model of logistic regression to examine if this response to assessing “content usefulness” factor of any of the two websites has any statistically explanatory power for a participant picking that particular website for question 2 – which website, in your opinion, is better at doing its job to interact with prospective students. This, in turn, will help analyse factors/elements that

had statistically significant power to explain a participant choosing a particular website to be better than another.

Table 5.13  
*Logistic regression for question 10*

Effect	DF	Score Chi-Square	Pr > ChiSq
Q5_8	1	2.7042	0.1001

The results denote that the variable ‘content usefulness’ is statistically NOT significant, at a significance level of 0.05, to a participant evaluating a particular website to be better in question 2. In other words, content usefulness cannot be considered as one of the significant factors that can be attributed to a participant choosing a website to be better in response to question 2.

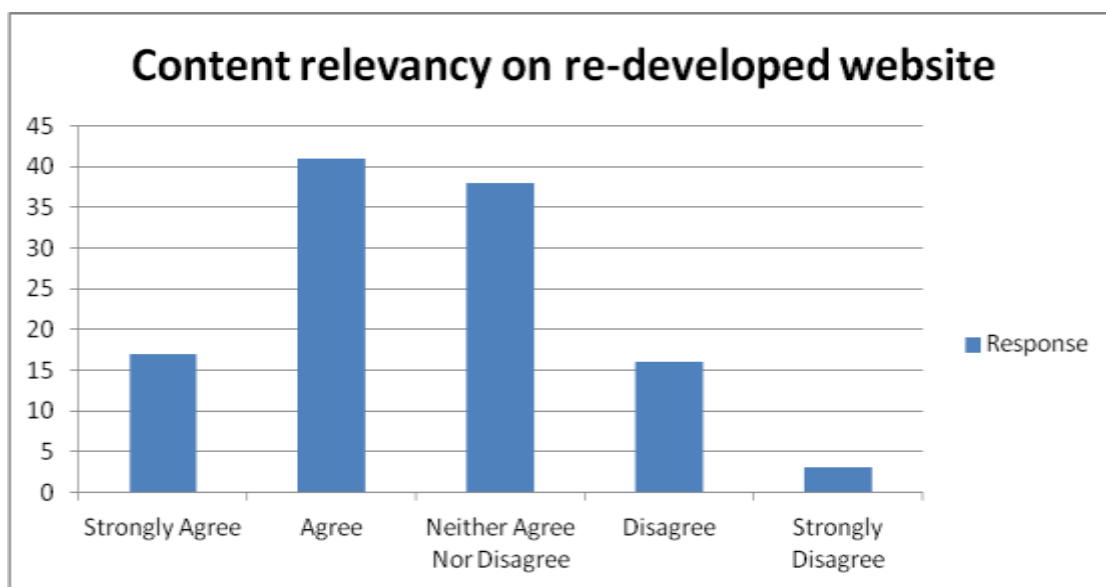
Conclusion: The researcher does not have statistical evidence to prove that content usefulness plays a significant role in deciding if the re-developed website is better than the old one.

Questions 11 and 12 (Data Fields Q5\_9 and Q5\_10): There was more information about the Department of Computer & Information Technology and events at Purdue on Website 1 than on Website 2

Explanation: These were the paired questions that assessed, from a prospective student website visitor’s point of view, if incorporating an element of content relevancy could

have had any explanatory power on choosing one website over another as a better one in response to question 2.

Analysis: Figure 5.7 shows the plots of counts for different categories of ordinal responses.



*Figure 5.7. Counts for categorical response variable for question 11*

Table 5.14. shows the results of the main effects model of logistic regression to examine if this response to assessing “content relevancy” factor of any of the two websites has any statistically explanatory power for a participant picking that particular website for question 2 – which website, in your opinion, is better at doing its job to interact with prospective students. This, in turn, will help analyse factors/elements that had statistically significant power to explain a participant choosing a particular website to be better than another.



Table 5.14  
*Logistic regression for question 11*

Effect	DF	Score Chi-Square	Pr > ChiSq
Q5_9	1	0.4090	0.5225

The results show that the variable 'content relevancy' is NOT statistically significant, at a significance level of 0.05, to a participant evaluating a particular website to be better in question 2. In other words, content relevancy cannot be confidently considered to be one of the significant factors that can be attributed to a participant choosing a website to be better in response to question 2.

Conclusion: The researcher does not have statistical confidence to prove that content relevancy plays a significant role in deciding if the re-developed website is better than the old one.

Question 13 (Data Field Q5\_11): There was more information on Website 1 about the activities at Purdue about diverse ethnic backgrounds than on Website 2.

Explanation: This question considered, from a prospective student website visitor's point of view, if incorporating an element of cultural markers could have had any explanatory power on choosing one website over another as a better one in response to question 2.

Analysis: Figure 5.8 shows plots of counts for different categories of ordinal responses.

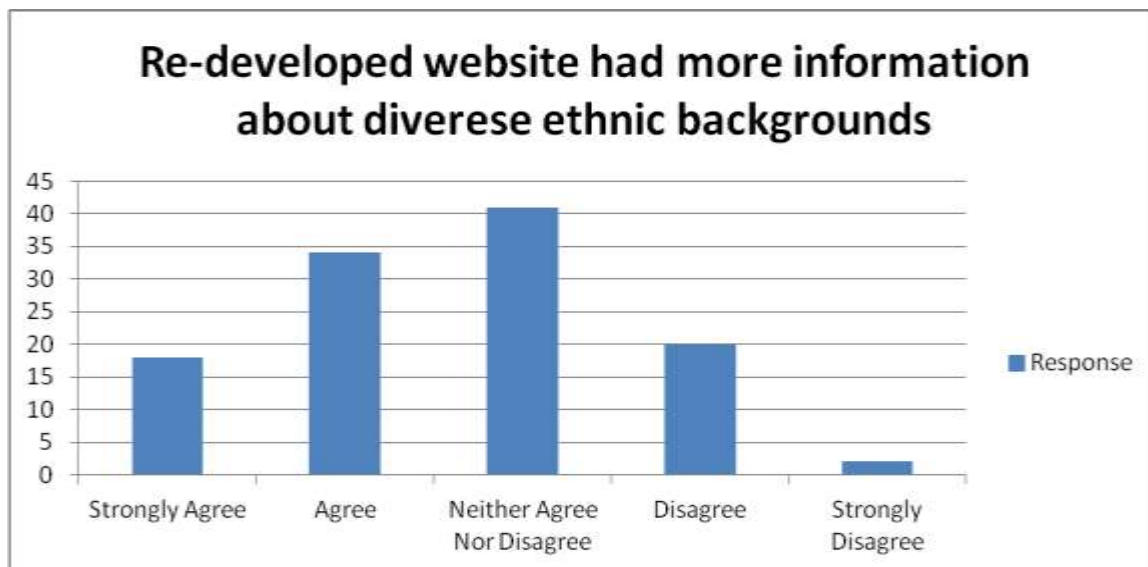


Figure 5.8. Counts for categorical response variable for question 13

Table 5.15. shows the results of the main effects model of logistic regression to examine if this response to assessing “cultural markers” factor of any of the two websites has any statistically explanatory power for a participant picking that particular website for question 2 – which website, in your opinion, is better at doing its job to interact with prospective students. This, in turn, will help analyse factors/elements that had statistically significant power to explain a participant choosing a particular website to be better than another.

Table 5.15

*Logistic regression for question 13*

Effect	DF	Score Chi-Square	Pr > ChiSq
Q5_11	1	1.4747	0.2246

The results denote that the variable 'cultural markers' is NOT statistically significant, at a significance level of 0.05, to a participant evaluating a particular website to be better in question 2. In other words, cultural markers cannot be confidently considered to be one of the significant factors that can be attributed to a participant choosing a website to be better in response to question 2.

Statistical non-significance of cultural markers requires elaborate explanation because the focus of this research effort has been to try to assess the impact of this cultural personalization. However, there is a strong possible explanation for this result. The survey instrument could not gather information about ethnicity of students and hence, there was no way to relate a response from a student, whether underrepresented or not, to he/she finding one website better over another. Additionally, the cultural personalization was available to only students that selected their ethnicity to be one of the underrepresented categories. Students that were caucasian males or females were not exposed to this cultural personalization. However, even such students answered this question, thereby, influencing the overall response.

Conclusion: Researcher does not have statistical evidence to prove that cultural markers play a significant role in deciding if the re-developed website is better than the old one.

Question 14 (Data field Q5\_12): The information provided on Website 2 was useful and easy to understand

Explanation and Analysis: This was a paired question with question 3. The analysis of responses is in agreement with the the one for question 10.

Conclusion: Researcher cannot provide statistical evidence that content usefulness thereby, plays a significant role in deciding if the re-developed website is better than the old one.

Question 15 (Data field Q5\_13): I found useful information about different programs at/initiatives at Purdue

Explanation and Analysis: The response to this question was misleading because it does not specifically compare two website. Therefore, a user's positive opinion could not be assumed to be for a re-developed website – leading to bias. Hence, this was a poorly framed question and could not be reliably analyzed.

Questions 16 and 17 (Data Fields Q5\_14 and Q5\_15): I could open all the links I clicked on website 1/website 2

Explanation: These were the paired questions that considered, from a prospective student website visitor's point of view, if incorporating an element of working links could have had any explanatory power on choosing one website over another as a better one in response to question 2.

Analysis: Figure 5.9 shows the plot of counts for different categories of ordinal responses.

Table 5.16. shows the results of main effects model of logistic regression to examine if this response to assessing "working links" factor of any of the two websites has any statistically explanatory power for a participant picking that particular website

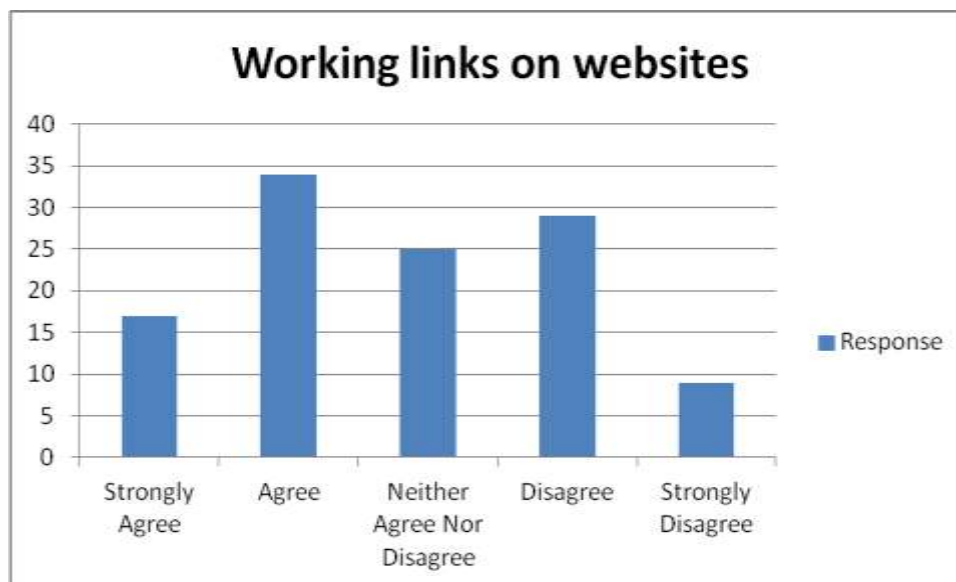


Figure 5.9. Counts for categorical response variable for question 16

for question 2 – which website, in your opinion, is better at doing its job to interact with prospective students. This, in turn, will help analyse factors/elements that had statistically significant power to explain a participant choosing a particular website to be better than another.

Table 5.16

*Logistic regression for question 16*

Effect	DF	Score Chi-Square	Pr > ChiSq
Q5_14	1	0.6910	0.4058

The results denote that the variable ‘working links’ is NOT statistically significant, at a significance level of 0.05, to a participant evaluating a particular website to be better in question 2. In other words, ‘working links’ cannot be confidently considered to

be one of the significant factors that can be attributed to a participant choosing a website to be better in response to question 2.

Conclusion: The researcher does not have statistical evidence to prove that element of 'working links' plays a significant role in deciding if the re-developed website is better than the old one.

Questions 18 and 19 (Data Fields Q5\_16 and Q5\_17): The interface on website 1/website 2 assisted me when I made an error, if any.

Explanation: These were the paired questions that considered, from a prospective student website visitor's point of view, if incorporating an element of assistive interface could have had any explanatory power on choosing one website over another as a better one in response to question 2.

Analysis: Figure 5.10 shows the plot of counts for different categories of ordinal responses.

Table 5.17. shows the results of the main effects model of logistic regression to examine if this response to assessing "assistive interface" factor of any of the two websites has any statistically explanatory power for a participant picking that particular website for question 2 – which website, in your opinion, is better at doing its job to interact with prospective students. This, in turn, will help analyse factors/elements that had statistically significant power to explain a participant choosing a particular website to be better than another.

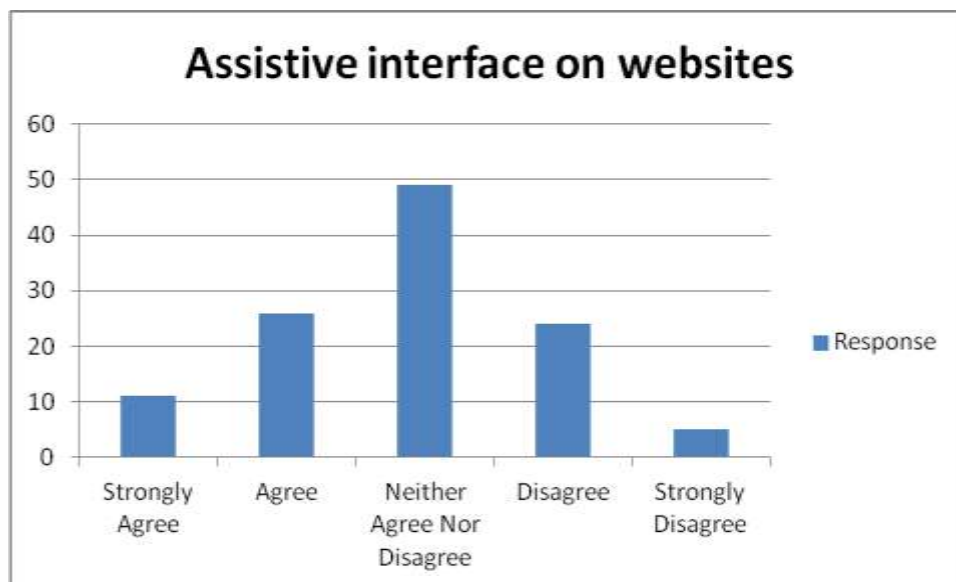


Figure 5.10. Counts for categorical response variable for question 18

Table 5.17

*Logistic regression for question 18*

Effect	DF	Score Chi-Square	Pr > ChiSq
Q5_16	1	0.4655	0.4951

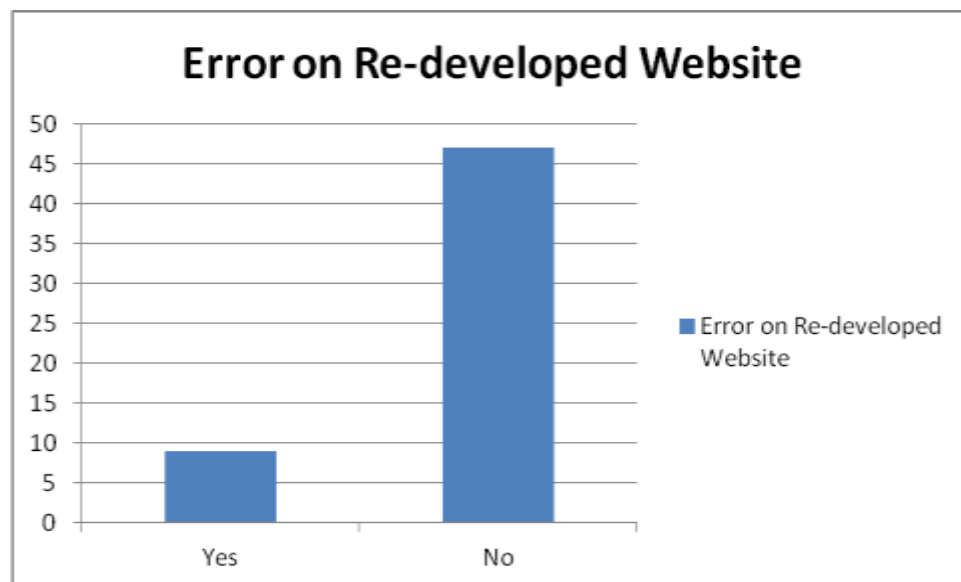
The results denote that the variable 'assistive interface' is NOT statistically significant, at a significance level of 0.05, to a participant evaluating a particular website to be better in question 2. In other words, 'assistive interface' cannot be confidently considered to be one of the significant factors that can be attributed to a participant choosing a website to be better in response to question 2.

Conclusion: The researcher does not have statistical evidence to prove that element of 'assistive interface' plays a significant role in deciding if the re-developed website is better than the old one.

Question 20 and 21 (Data Fields Q6 and Q7): Did you encounter an error while using the Website1 or / were stuck at any point? Please answer yes or no.

Explanation: The question tried to gauge if a student ever faced an error during his interaction on the website which may influence his/her response in evaluating a website to be better or worse than another. This was to ensure that websites, the way they were presented to students, were error-free.

Analysis: Figures 5.11 and 5.12 show the counts for number of respondents that found an error on any of the websites. Tables 5.18, 5.19, 5.20 and 5.21 show that these results are statistically significant (significance level 0.0001) and have not occurred solely by chance.



*Figure 5.11.* Error on Re-developed website



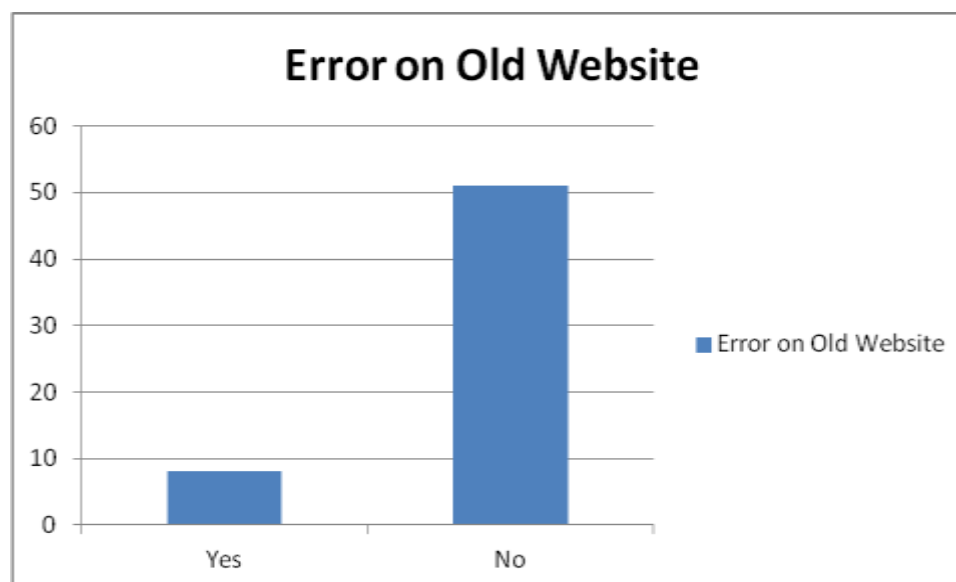


Figure 5.12. Error on Old website

Table 5.18

*One-way frequencies for count of error of Re-developed website*

Q6				
Q6	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	9	16.07	9	16.07
2	47	83.93	56	100.00

Table 5.19

*Chi Square Test for Equal Proportions for Table 5.18*

Chi-Square	25.7857
DF	1
Pr > ChiSq	< .0001
Frequency Missing = 3	

Table 5.20

*One-way frequencies for count of error of Old website*

Q6				
Q6	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	8	13.56	8	13.56
2	51	86.44	59	100.00

Table 5.21

*Chi Square Test for Equal Proportions for Table 5.20*

Chi-Square	31.3390
DF	1
Pr > ChiSq	< .0001
Frequency Missing = 3	

### 5.3.1 Consolidating Quantitative Data Analyses

To summarize the results of statistical tests from Section 5.3, table 5.22 lists which of the individual main effect models were significant enough when analyzed using Logistic Regression.

Table 5.22

*Categorizing Response Variables*

Significant Response Variables	Non-significant response variables
Ease of use	Content usefulness
Ease of navigation	Content relevancy
Visual appeal	Cultural markers
Interface consistency	Working links
	Assistive interface

Now, once the study has identified the variables significant enough to decide one website to be better over another, it can analyze if any of these response variable interact between each other to produce the result at hand. Table 5.23 shows the SAS output.

From the Pr > ChiSq column in Table 5.23, it can be concluded that none of the considered response variables have a statistically significant 'interactive effect' on the choice of a website being better than another – in response to question 2 of the survey

questionnaire. Hence, all these factors need to be considered in separation from one another, and there is no combined interactive effect observed in the data.

Table 5.23

*Interactive model of logistic regression*

Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	1	-5.0425	2.9311	2.9596	0.0854
Q5_1	1	0.6519	0.4132	2.4889	0.1147
Q5_5	1	0.3160	0.4119	0.5884	0.4431
Q5_6	1	0.7086	0.4132	2.9410	0.0864
Q5_7	1	0.2245	0.4673	0.2307	0.6310
Q5_1* Q5_5 * Q5_6* Q5_7	1	0.00541	0.0114	0.2259	0.6346

In other words this also means that the responses to questions assessing these qualities of re-developed website over the old one, respondents have not shown any trend in one of these implemented characteristics affecting the other.

#### 5.4 Data Analysis – Qualitative

Qualitative data for the concluding 2 questions of the survey instrument have been analyzed using constant comparison method discussed in Literature Review section. Rest of this section tries to analyze the remaining two questions of the survey instrument, using qualitative data analysis.

Questions 22 and 23(Data Fields Q8 and Q9): Please briefly list any features that you feel would enhance the usability of Website 1/Website 2.

Analysis: Responses to this question have been analyzed separately for two websites and listing results in terms of categories of responses that were reported. These are the categories that were identified by students as the ones that need most attention in enhancing the usability of either website.

Table 5.24 lists the consolidated results in terms of significant categories. These are the results of constant comparison method applied on the responses of two questions. There was a significant non-response observed for this question, it being towards the end of the survey and a free form non-mandatory one. Non-response includes not having answered this question/entered not applicable or NA or entered irrelevant or garbled values as it was not a mandatory. The results in Table 5.24 present these categories as a percentage of total respondents. Table 5.24 shows that 54% of the respondents regarded visual appeal, user interface, and comprehensiveness of the website as features that would enhance website usability pertaining to the old website. They felt the website was lacking those elements and if added could help enhance the usability. On the other hand, there are only 9% of the respondents thought the re-designed websites needs any changes on this category.

#### 5.4.1 Implementing Qualitative Responses

Responses to qualitative questions include suggestions which have been implemented in the re-developed system. Some of the suggestions could not be implemented with the existing infrastructure or are out of the scope of this study to be analyzed and incorporated. One of the important improvements implemented was to

Table 5.24

*Categories perceived out of qualitative responses to questions 22 & 23*

Old Website		Re-designed Website	
Category	Count as a % of Total Respondents	Category	Count as a % of Total Respondents
Visual appeal/Colorful look/Professional look	54%	Look and feel/Aesthetics/Appeal	9.15%
Structure/Design of web- form	3.48%	Page refresh	3.48%
Information content	2.61%	Form/Structure/Design Information Content	4.38% 0.87%


make the field of choosing a high school as non-mandatory one. The original design had a student pick his/her school from a list of schools that pops up depending on the zip-code entered.

Although, a fair number of students liked this feature, it also had a setback that the pop-up window may not open at all times depending on the client's browser setting, and it is out of the control of the developer. This field is highlighted in Figure 5.13. In the initial design, the purpose of not letting the student enter his/her high-school was


- To make sure the system captures valid data and deters a user from entering misleading values, hence, this field was earlier non-editable and could only be populated depending on the value of the school name selected in the pop-up box.

- To let the system contact the National Center for Education Statistics portal to get more information about a student's demographic and background using accurate parameters. For example, if there are any typos in the school name entered by the student, the re-designed website may not be able to contact NCES web query tool and get appropriate information.

However, because of the before-mentioned reason this field is now editable and user is trusted to enter correct information.



[«Purdue](#)
[CoT Home](#)
[Students](#)
[Alumni & Friends](#)
[Audiences](#)



**COMPUTER & INFORMATION TECHNOLOGY**

[About Us](#)
[Academics](#)
[Research](#)
[Partners](#)
[Current Students](#)
[Directory](#)

Please fill in all fields as accurately as possible. Fields marked with \* are mandatory.

### Your Contact Information

First Name \*

Dipti

Last Name \*

Desai

Gender \*

Female

☒ I am home schooled.

High School City Zip \*

47905

☐ Outside USA

Click This Button to Select Your High School

High School Name

Current GPA

4.0

High School Graduation Year

2007

High School Country

United States

High School State

Indiana

Have you taken SAT?

☐ Yes

Email \*

desai14@purdue.edu

Phone

4241531231

Ethnicity

Native American/Alaskan Native

### We want you to excel!

[Scholarships](#)
[Free Tutoring](#)
[Diversity](#)

More than \$200,000 in scholarships is awarded annually by the College of Technology to its students based on merit and need. Last year, 185 students benefitted from scholarships awarded by the college. To be considered, beginning and continuing students must submit a scholarship application each year.

[MORE>>>](#)


### News Feed

Fri, 11 May 2012 20:13:05 +0000	Charging ahead
Fri, 11 May 2012 20:12:54 +0000	Q&A: The Future of Electricity
Fri, 11 May 2012 20:11:06 +0000	Ignite ideas: Commercialize
Wed, 02 May 2012 13:21:44 +0000	Getting to know Dawn Laux
Wed, 02 May 2012 13:19:03 +0000	Technology students honored

### What are your interests?

☐ Biomedical Informatics & High Performance Computing
 ☐ Computer Forensics
 ☐ Database Management
 ☐ Discovery Support System
 ☐ End User Computing
 ☐ IT Health Care
 ☐ Network Engineering Technology/Security
 ☒ Software Development
 ☐ Systems Integration
 ☐ IT Energy Systems
 ☐ Robotics

### Unity in Diversity!!



### Comments, Questions, Need more information about CIT?

Figure 5.13.Design improvements

## 5.5 Discussion

This study was focused on understanding if the improvements, primarily in terms of ethnic personalization, and secondarily in terms of website design, appeal to the interests of prospective students or not. The survey responses indicate with statistically significant numbers on each category that users did prefer the new design over the old design in terms of its ease of use, ease of navigation, visual appeal and interface consistency on the redesigned website. These results are in agreement with the results of the study that looks at perceived usability and satisfaction on a website (Flavia'n, Guinali'ú, & Gurrea, 2005) and the study that applied the techniques of traditional system design to website design (Marquis, 2002). None of the other factors seems to have statistically influenced the decision of a participant to prefer the re-designed website over the other, which indicates that there could be other factors that a future study should consider. This is in agreement with the results cited in a paper that tried to propose a framework for evaluating academic website quality (Mebrate, 2010). From the analysis of qualitative questions, it is also reflected that more than 50% of the students regarded visual appeal and user interface of a website to be linked to its usability when asked for suggestions to improve either of the two websites.

However, analysis of responses to questions that yield insights on whether the cultural markers to personalize the interaction increased a redesigned website's appeal to the user did not yield statistically significant results. Several explanations are possible for this to take place and are beyond the scope of this study. The researcher, therefore,



has investigated the causes of misleading or non-responses and presented those as limitations of the existing study and recommendations for further studies.

#### 5.5.1 Limitations of the Study

This section tries to state the limitations of the study from the knowledge gathered throughout the duration of the research so as to let the future work be guided by these efforts. Below is the list of elements identified to have negatively influenced the responses to the survey questionnaire, along with the discussion to prevent flaws, if any, in the future.

1. Length of the survey and placement of questions: Length of the survey instrument plays an important role in the response rate as well as the quality of responses. Questions asked later in the questionnaire pose a significant possibility of producing lower quality data (Galesic, & Bosnjak, 2009). This can be attributed to the accumulating fatigue and boredom along with the length of the survey. Questions that are primarily aimed at gathering data for the main research questions should, therefore, be placed at the beginning or close to the beginning of the survey.

However, there is sometimes a compelling need to include questions that validate each other's responses. E.g. cross-verifying answers to questions:

- (a) Is A greater than B? and
- (b) Is B is less than or equal to A?

tells the researcher if a response was thoughtful or haphazard. Such pairs of questions help in validating the data, thereby, instilling confidence in the quality of data but at the same time increase the length of the questionnaire. Future studies should, therefore, aim for an optimal length of the survey.

2. Incentives for subjects: An extrinsic motivator plays an important role in a participant's intrinsic interests to follow through a survey, be it lengthy or otherwise (Galesic, & Bosnjak, 2009). The approved protocol and the budget of the study did not allow for any incentives to be granted to subjects. Future work should consider offering incentives to the population for successful completion of the survey instrument. A few examples of such incentives for the same population as this study are bonus points/extra credit for taking the survey, a gift card awarded by lottery system, etc.
3. Progress indicators: Graphic progress indicators in survey design can help keep the respondents motivated to finish the survey, but an additional processing/download time involved with such features may hamper the overall experience (Couper, Traugott, & Lamias, 2001). Future studies should take care to make a prudent use of such tools by using advanced technologies and tools that will provide better features for administering surveys yet not add to the download time. An alternative to this could be to have an optimal-length survey on a single webpage with scrollbars.
4. Duration of surveys: The survey tool Qualtrics tracks survey durations and also provides brief statistics about a particular survey based on how much time every

respondent spent to complete a survey. Table 5.9 lists these statistics from Qualtrics.

Table 5.25  
*Survey Durations*

Group	Total Responses	Duration Mean ( <i>hh:mm</i> )
Monday, April 16, 2012	63	0:07
Thursday, April 19, 2012	34	0:04
Friday, April 20, 2012, 11:30am	16	0:06
Friday, April 20, 2012, 3:30pm	19	0:05
Average Duration Mean		0:06

As shown in Table 5.9, a participant spent 6 minutes on an average to finish a survey. This mean, however, is skewed towards the higher end by outliers that took an unusual amount of time to complete the survey, e.g. survey durations of 39m 59s, 46m 37s, 1h 8m 4s, 45m 32s, 44m 40s. Hence, in the absence of these outliers, the mean duration would have been even lower. However, the expected time to complete the survey was 8-10 minutes provided that participants thoughtfully answer every question. Hence, there seems to be a good enough difference between the observed and expected duration means. This may be attributed to participants being students and the survey being administered during the lab section. Hence, the subjects could be expected to have hurriedly completed the survey instrument without much sincerity and thoughtfulness. Future studies should consider dedicating a period of time to administer surveys or consider sending web survey links in email with enough

lead time to account for allowing plenty of time to let students complete the survey. This, however, poses another challenge of non-response which needs to be considered while designing a study.

5. Testing website features: The redesigned website included personalization features such as cultural markers relevant to ethnicity of a student and pertaining to the interests entered by the student on the web form. Referring to the lower duration mean for survey responses and the analysis from logistic regression, there is a fair possibility that not all participants have tested all the features of the redesigned website. Future survey instruments should encourage participants to try the primary features before starting to take the survey. This, however, poses a risk of researcher bias and should be avoided while formulating future studies.

### 5.6 Recommendations for Future Studies

Testing of academic websites, especially for prospective students, may not be a one-time activity because students keep visiting a website over the duration of an academic year and otherwise. Hence, continual improvements are necessary in order to cater to the existing needs of the user group. This needs to be an iterative process of re-design/re-development and assessment. Based on this post-study analysis of the process, methodology and outcomes, below are the recommendations for future studies:

1. Category of subjects: This study considered only the prospective students as the subjects and thereby, the users of a website. Although this helped in narrowing down the scope of the study and finding answers from pre-defined perspectives, users of an academic website are not only the prospective students. Guardian/parents of prospective students are equally likely to be the users of an academic website. Hence, future studies may also focus their efforts on personalization based on type of user that is requesting information from the website. Also, future designs should consider having further emphasis and personalization for women/female prospective students and/or their parents.
2. Evaluation criteria: From an extensive study of literature, this study tried to selectively implement and assess specific elements of website design identified in the past work. It failed to develop, implement and evaluate an exhaustive list of these design elements due to the limitations on scope, time and budget. However, some design elements demonstrate much more importance to a group of subjects than others. Hence, identifying critical factors to a particular design for a particular group of users is crucial and needs to be considered by future work.
3. Re-design framework: Although this study was not able to find definitive answers to its research questions, the re-design of the website which engages the department and the diversity office of a college in recruiting under-represented minorities, is believed to prove helpful in effectively designing future outreach programs.

4. Development platform: Future studies should incorporate the platform upgrade of ASP.NET 2.0 to the latest version. This will enhance the user experience along with providing the developer with further resources to incorporate newer development technologies such as AJAX, Silverlight etc.

## LIST OF REFERENCES

## LIST OF REFERENCES

- Agarwal, R., & Venkatesh, V. (2002). Assessing a Firm's Web Presence: A Heuristic Evaluation Procedure for the Measurement of Usability. *Information Systems Research*, 13(2), 168-186.
- Barber, W., & Badre, A. (June, 1998). *Culturability: The merging of culture and usability*. Proceedings of the 4<sup>th</sup> Conference on Human Factors and the Web. Basking Ridge, NJ, USA. Retrieved from <http://research.microsoft.com/en-us/um/people/marycz/hfweb98/barber/>
- Baskin, D. M. (2008). *The influence of pre-college interventions on underrepresented minority student persistence and graduation: Evidence from a Midwest comprehensive university*. Diss. University of Wisconsin - Madison, 2008. Retrieved from ProQuest Dissertations and Theses database. (AAT 3348715)
- Beggs, J. M., Bantham, J. H., & Taylor, S. (2008). Distinguishing the factors influencing college students' choice of major. *College Student Journal*. (179348418)
- Bernier, J. L., Barchein, M., Canas, A., Gomez-Valenzuela, C., & Merelo, J. J. (2005). The services a university website should offer. *Information Society and Education: Monitoring a Revolution. Education Society Series* 9 (3), 1746–1750
- Bertram, D. (2007). Likert scales. Retrieved May 18, 2012, from the University of Calgary, Department of Computer Science Web Site: <http://poincare.matf.bg.ac.rs/~kristina//topic-dane-likert.pdf>
- Business-Higher Education Forum. (2010). Increasing the Number of STEM Graduates: Insights from the U.S. STEM Education & Modeling Project. Retrieved from [http://www.bhef.com/solutions/documents/BHEF\\_STEM\\_Report.pdf](http://www.bhef.com/solutions/documents/BHEF_STEM_Report.pdf)
- Cairncross, F. (1997). *The death of distance: How the communications revolution will change our lives*. Boston, MA: Harvard Business School Press.
- Camp, T. (1997). The incredible shrinking pipeline. *Communications of the ACM* 40(10), 103-110. DOI=10.1145/262793.262813. Retrieved from <http://doi.acm.org/10.1145/262793.262813>



- Chak, A. (2003). *Submit now: Designing persuasive websites*. Indianapolis, Indiana: New Riders.
- Chen, J. (2009). The Impact of Aesthetics on Attitudes Towards Websites. Retrieved from <http://www.usability.gov/articles/062009news.html>
- Chiew, T. K., & Salim, S. S. (2003). WEBUSE, Website Usability Evaluation Tool. *Malaysian Journal of Computer Science*, 16(1). 47-57. Retrieved from <http://mjcs.fsktm.um.edu.my/document.aspx?FileName=199.pdf>
- Chute, E. (2009, February 10). *Lack of diversity part of equation in STEM fields*. Retrieved from <http://www.post-gazette.com/pg/09041/947952-298.stm>
- Commission on Professionals in Science and Technology -CPST (2007, Oct 9). *Is US science and technology adrift?* STEM Workforce Data Project: Report No. 8. Washington, DC: CPST
- Committee on Prospering in the Global Economy of the 21st Century: An Agenda for American Science and Technology, National Academy of Sciences, National Academy of Engineering, Institute of Medicine. (2007). *Summary of Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future*. Washington, DC: The National Academies Press.
- Committee on Underrepresented Groups and the Expansion of the Science and Engineering Workforce Pipeline, Committee on Science, Engineering, and Public Policy; Policy and Global Affairs, National Academy of Sciences, National Academy of Engineering, and Institute of Medicine. (2011). *Expanding underrepresented minority participation: America's science and technology talent at the crossroads*. Washington, DC: The National Academies Press.
- Couper, M. P., Traugott, M. W., & Lamias, M. J. (2001). Web Survey Design and Administration. *Public Opinion Quarterly*, 65(2), 230-253. Retrieved from <http://www.jstor.org/stable/pdfplus/3078803.pdf?acceptTC=true>
- Crampton, W. J., Walstrom, K. A., & Schambach, T. P. (2006). Factors influencing major selection by college of business students. *Issues in Information Systems*, 6(1). Retrieved from [http://www.iacis.org/iis/2006\\_iis/PDFs/Crampton\\_Walstrom\\_Schambach.pdf](http://www.iacis.org/iis/2006_iis/PDFs/Crampton_Walstrom_Schambach.pdf)
- CSUN (California State University, Northridge). (n.d.). *When to Use a Particular Statistical Test*. Retrieved from <http://www.csun.edu/~amarenco/Fcs%20682/When%20to%20use%20what%20test.pdf>

- Davern, M. J., Te'eni, D., & Moon, J. Y. (2000). Content versus structure in information environments: a longitudinal analysis of website preferences. In *Proceedings of the twenty first international conference on Information systems (ICIS '00)*. Association for Information Systems, Atlanta, GA, USA, 564-570.
- Dey, I. (1993). Creating categories. *Qualitative data analysis* (pp. 94-112). London: Routledge.
- Dye, J. F., Schatz, I. M., Rosenberg, B. A., & Coleman, S. T. (2000). Constant comparison method: A kaleidoscope of data. *The Qualitative Report [On-line serial]*, January 2000, 4(1/2). Retrieved May 6, 2012 from <http://www.nova.edu/ssss/QR/QR4-1/dye.html>
- Chou, E. (2002). Redesigning a large and complex website: how to begin, and a method for success. In *Proceedings of the 30th annual ACM SIGUCCS conference on User services (SIGUCCS '02)*. ACM, New York, NY, USA, 22-28.  
DOI=10.1145/588646.588652 <http://doi.acm.org/10.1145/588646.588652>
- Elling, S., Lentz, L., de Jong, M.: Website Evaluation Questionnaire. In: Wimmer, M.A., Scholl, J., Grönlund, Å. (eds.) EGOV 2007. LNCS, vol. 4656, pp. 293-304. Springer, Heidelberg (2007).
- Fallman D. (2003). *Design-oriented human-computer interaction*. In Proceedings of the SIGCHI conference on Human factors in computing systems (CHI '03). ACM, New York, NY, USA, 225-232. DOI=10.1145/642611.642652. Retrieved from <http://doi.acm.org/10.1145/642611.642652>
- Ferrari, J. R., & Parker, J. T. (1992). High-school achievement, self-efficacy, and locus of control as predictors of freshman academic performance. *Psychological Reports*, 71 (2), pp. 515–518
- Flavia'n, C., Guinali' u, M., & Gurrea, R. (2005). The role played by perceived usability, satisfaction and consumer trust on website loyalty. *Information & Management*, 43(2006). 1-14. doi: 10.1016/j.im.2005.01.002. Retrieved from [http://ac.els-cdn.com/S0378720605000169/1-s2.0-S0378720605000169-main.pdf?\\_tid=dcd15e26897b3608e56f947f82be42ac&acdnat=1339183713\\_acf466380c61a0a2dc0ea479d4fc3129](http://ac.els-cdn.com/S0378720605000169/1-s2.0-S0378720605000169-main.pdf?_tid=dcd15e26897b3608e56f947f82be42ac&acdnat=1339183713_acf466380c61a0a2dc0ea479d4fc3129)
- Galesic, M., & Bosnjak, M. (2009). Effects of questionnaire length on participation and indicators of response quality in a web survey. *Public Opinion Quarterly*, 73,349–360. Retrieved from <http://poq.oxfordjournals.org/content/73/2/349.full.pdf+html>

- Gillett-Karam, R., Roueche, S., & Roueche, J. (1991). *Underrepresentation and the question of diversity: Women and minorities in the community college*. Washington, DC: Community College Press.
- Green, D., & Pearson, J. (2006). Development of a website usability instrument based on ISO 9241-11. *Journal Of Computer Information Systems*, 47(1), 66-72.
- Gullikson, S., Blades, R., Bragdon, M., McKibbin, S., Sparling, M., & Toms, E. (1999). The impact of information architecture on academic web site usability. *Electronic Library, The*, 17(5), 293-304
- Jackson, S. A. (2002). *The quiet crisis: Falling short in producing American scientific and technical talent*. Retrieved February 4, 2009 from the Best Workforce website at [http://www.bestworkforce.org/Zip/BEST\\_QuietCrisis.zip](http://www.bestworkforce.org/Zip/BEST_QuietCrisis.zip)
- Jeng, J. (2005). *What Is Usability in the Context of the Digital Library and How Can It Be Measured?* Retrieved March 5, 2012 from [https://inventory.pbworks.com/f/Usability\\_DL.pdf](https://inventory.pbworks.com/f/Usability_DL.pdf)
- Kaczmarek, L. (2005). Web surveys. A brief guide on usability and implementation issues. Retrieved from [http://tenuki.pl/teksty/Web\\_Surveys\\_A\\_Brief\\_Guide\\_on\\_Implementation\\_and\\_Usability.pdf](http://tenuki.pl/teksty/Web_Surveys_A_Brief_Guide_on_Implementation_and_Usability.pdf)
- Kalyanaraman, S., & Sundar, S. S. (2006). The Psychological Appeal of Personalized Content in Web Portals: Does Customization Affect Attitudes and Behavior?. *Journal of Communication*, 56: 110–132. doi: 10.1111/j.1460-2466.2006.00006.x
- Koonce, D. A., Zhou, J., Anderson, C. D., Hening, D. A., & Conley, V. M. (2011). What is stem?. *American Society for Engineering Education, 2011*. Retrieved from [http://search.asee.org/search/fetch;jsessionid=29j8q4gl2c48u?url=file%3A//localhost/E%3A/search/conference/AC2011/ASEE\\_AC2011\\_289.pdf&index=conference\\_papers&space=129746797203605791716676178&type=application/pdf&charset=](http://search.asee.org/search/fetch;jsessionid=29j8q4gl2c48u?url=file%3A//localhost/E%3A/search/conference/AC2011/ASEE_AC2011_289.pdf&index=conference_papers&space=129746797203605791716676178&type=application/pdf&charset=)
- Lawrence, D., & Tavakol, S. (2007). *Balanced website design: optimising aesthetics, usability and purpose*. London, UK: Springer.
- Litwin, M. (1995). *How to Measure Survey Reliability and Validity*. California: SAGE Publications, Inc.
- Liu, S. (2008). Engaging users: The future of academic library web sites. *College & Research Libraries*, 69(1). Retrieved from <http://crl.acrl.org/content/69/1/6.full.pdf+html>

- Lowell, B. L., & Regets, M. (2006, August). *A half-century snapshot of the STEM workforce, 1950-2000*. Washington, D.C.: Commission on Professionals in Science and Technology.
- Manning, K., & Coleman-Boatwright, P. (1991). Student Affairs Initiatives Toward a Multicultural University. *Journal of College Student Development*, July 1991(32). Retrieved from [http://diversityplan.umwblogs.org/files/2009/02/manning\\_boatwright-multicultural\\_univ1.pdf](http://diversityplan.umwblogs.org/files/2009/02/manning_boatwright-multicultural_univ1.pdf)
- Marquis, G. P. (2002). Application of traditional system design techniques to web site design. *Information and Software Technology*, 44(9), 507–512. doi:10.1016/S0950-5849(02)00050-2
- Maurer, T. J., & Pierce, H. R. (1998). A comparison of Likert scale and traditional measures of self-efficacy. *Journal of Applied Psychology*. 6, 835-852. Retrieved from <http://doi.apa.org/getdoi.cfm?doi=10.1037/0021-9010.83.2.324>
- McCullough, C. (2002). Attracting Under-Represented Groups to Engineering and Computer Science. *ASEE Southeast Section Conference*. Starkville, MS. Retrieved from <http://155.225.14.146/asee-se/proceedings/ASEE2002/P2002046COEETMCC.pdf>
- McPhail, I. P. (2011, January 31). *Commentary: Find ways to push minorities' science and tech education*. Retrieved from <http://www.washingtonpost.com/wp-dyn/content/article/2011/01/28/AR2011012805974.html>
- Mebrate, T. W. (August, 2010). *A framework for evaluating Academic Website's quality From students' perspective*. Retrieved from [http://www.google.com/url?sa=t&rct=j&q=a%20framework%20for%20evaluating%20academicwebsite%E2%80%99s%20qualityfrom%20students%E2%80%99perspective&source=web&cd=1&ved=0CEQQFjAA&url=http%3A%2F%2Frepository.tudelft.nl%2Fassets%2Fuuid%3Ae84e37a0-a058-4f40-a984-5f8eea8d5f07%2FTsigereda\\_Mebrate\\_\\_Masters\\_Thesis\\_Final\\_Report.pdf&ei=EV\\_ST\\_ymO4K06gHDhby1Aw&usg=AFQjCNFgakKC2maw6Siq8XVJgyZVg6H0ow](http://www.google.com/url?sa=t&rct=j&q=a%20framework%20for%20evaluating%20academicwebsite%E2%80%99s%20qualityfrom%20students%E2%80%99perspective&source=web&cd=1&ved=0CEQQFjAA&url=http%3A%2F%2Frepository.tudelft.nl%2Fassets%2Fuuid%3Ae84e37a0-a058-4f40-a984-5f8eea8d5f07%2FTsigereda_Mebrate__Masters_Thesis_Final_Report.pdf&ei=EV_ST_ymO4K06gHDhby1Aw&usg=AFQjCNFgakKC2maw6Siq8XVJgyZVg6H0ow)
- Nagel, D. (2008, May 2). *Report: STEM Gap Widens for Underrepresented Minorities*. Retrieved from <http://thejournal.com/Articles/2008/05/02/Report-STEM-Gap-Widens-for-Underrepresented-Minorities.aspx?p=1>
- NCES Digest of Education Statistics; Science & Engineering Indicators 2008. (2008). Retrieved from <http://www.cpe.vt.edu/yscoa/ecybermiss-rfp-final.pdf>
- Nielsen, J. (2003). Usability 101: Introduction to Usability. Retrieved from <http://www.useit.com/alertbox/20030825.html>

- Ohland, M.W., Guili Z., Thorndyke, B., & Anderson, T.J. (2004). Grade-point average, changes of major, and majors selected by students leaving engineering. *Frontiers in Education, 2004. FIE 2004. 34th Annual, T1G- 12-17 Vol. 1*, 20-23. doi: 10.1109/FIE.2004.1408475
- Olsina, L., Godoy, D., Lafuente, G., & Rossi, G. (2010). Assessing the quality of academic websites: a case study. *New Review of Hypermedia and Multimedia*, 5(1), 81-103. Retrieved from <http://dx.doi.org/10.1080/13614569908914709>
- Pinellas School District, & the Florida Center for Instructional Technology. (n.d.). Reliability and Validity. *Classroom Assessment*. Retrieved June 8, 2012 from <http://fcit.usf.edu/assessment/basic/basicc.html>
- Schwabe, D., Rossi, G., Esmeraldo, L., & Lyardet, F. (2001). Web Design Frameworks: An Approach to Improve Reuse in Web Applications Web Engineering. Retrieved from <http://www.springerlink.com/content/pruktjx6wa5t5ue6/>
- Simard, C. (2009). *Obstacles and solution for underrepresented minorities in technology*. Retrieved from <http://anitaborg.org/files/obstacles-and-solutions-for-underrepresented-minorities-in-technology.pdf>
- Simard, C., Stephenson, C., & Kosaraju, D. (2010). *Addressing core equity issues in computer science education: Identifying barriers and sharing strategies*. Retrieved from <http://anitaborg.org/files/ABI-csta-full-report.pdf>
- Stokes, M. E., Davis, C. S., & Koch, G. G. (2000). *Categorical Data Analysis Using the SAS System, Second Edition*. Cary, NC: SAS Institute Inc., 2000
- Targeted News Service. (April 1, 2009). *Underrepresented minorities benefit from program to boost participation in science-related studies*. Washington, D.C.: Targeted News Service. Retrieved from <http://search.proquest.com/docview/468432608?accountid=13360>
- The President's Council of Advisors on Science and Technology. (2010). *Prepare and Inspire: K-12 Science, Technology, Engineering, and Math (STEM) Education for America's Future*. Retrieved May 31, 2012 from <http://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast-stemed-report.pdf>
- The President's Council of Advisors on Science and Technology. (2012). *Engage to Excel: Producing One Million Additional College Graduates with Degrees in Science, Technology, Engineering, and Mathematics*. Retrieved May 31, 2012 from [http://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast-engage-to-excel-final\\_2-25-12.pdf](http://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast-engage-to-excel-final_2-25-12.pdf)

- Thomas, D. A., & Gabarro, J. J. (1999). *Breaking through: The making of minority executives in corporate america*. Boston, MA: Harvard Business School Press.
- Tullis, T. S., & Stetson, J. N. (2004). *A Comparison of Questionnaires for Assessing Website Usability*. Retrieved from <http://home.comcast.net/~tomtullis/publications/UPA2004TullisStetson.pdf>
- Urry, M. (2011, September 23). *Lesson of a falling satellite*. Retrieved from [http://articles.cnn.com/2011-09-23/opinion/opinion\\_urry-satellite-science-education\\_1\\_engineers-physics-sheila-tobias?\\_s=PM:OPINION](http://articles.cnn.com/2011-09-23/opinion/opinion_urry-satellite-science-education_1_engineers-physics-sheila-tobias?_s=PM:OPINION)
- Venkatesh, V. (2000). Determinants of Perceived Ease of Use: Integrating Control, Intrinsic Motivation, and Emotion into the Technology Acceptance Model. *Information Systems Research*, 11(4), 342–365. Retrieved from <http://sukkarieh.net/shared/NJIT/venkatesh.pdf>
- Wang, M., and Yen, B. (2010). *The Effects of Website Personalization on User Intention to Return through Cognitive Beliefs and Affective Reactions*. PACIS 2010 Proceedings. Paper 155. <http://aisel.aisnet.org/pacis2010/155>
- Weaver, G. C., Haghighi, K., Cook, D. D., Foster, C. J., Moon, S.M., Phegley, P. J., & Tormoehlen, R. L. (2007). *Attracting Students to STEM Careers* [White paper]. Retrieved from [http://www.purdue.edu/strategic\\_plan/whitepapers/STEM.pdf](http://www.purdue.edu/strategic_plan/whitepapers/STEM.pdf)
- Wolcott, H. F. (1994). Transforming qualitative data: Description, analysis and interpretation. Retrieved from [http://books.google.com/books?hl=en&lr=&id=BMqxX\\_TaWNEC&oi=fnd&pg=PA1&dq=Preparing+Data+for+Analysis&ots=1Aq\\_eRBNxB&sig=2XTPfKVyY7hSz6ekQwktqOs6iRo#v=onepage&q=Preparing%20Data%20for%20Analysis&f=false](http://books.google.com/books?hl=en&lr=&id=BMqxX_TaWNEC&oi=fnd&pg=PA1&dq=Preparing+Data+for+Analysis&ots=1Aq_eRBNxB&sig=2XTPfKVyY7hSz6ekQwktqOs6iRo#v=onepage&q=Preparing%20Data%20for%20Analysis&f=false)
- Yang, Z., Cai, S., Zhou, Z., & Zhou, N. (May, 2005). Development and validation of an instrument to measure user perceived service quality of information presenting Web portals. *Information & Management*, 42(5). 575-589. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0378720604000734>
- Zhang, P., von Dran, G., Blake, P., & Pipithsuksunt, V. (2000). *A comparison of the most important Website features in different domains: An empirical study of user perceptions*. Proceedings of Americas Conference on Information Systems (AMCIS'2000), Long Beach, CA. August 10-13, 2000. pp. 1367-1372.
- Zhao, W., Massey, B., Murphy, J., & Fang, L. (2010). Cultural Dimensions of Website Design and Content. *Prometheus: Critical Studies in Innovation*, 21(1), 74-84. Retrieved from <http://dx.doi.org/10.1080/0810902032000051027>

## APPENDICES

## Appendix A CIT Info Sheet

CIT Info Sheet (Page 1)**Department of Computer and Information Technology (CIT)**

<http://www.tech.purdue.edu/cit>

**CIT Important Information:**

CIT offers bachelor's degrees with courses in the following areas:

- Computational Life Sciences
- Computer Forensics
- Database Management
- Information Security & Assurance
- Information Systems
- Information Technology Health Care
- Network Engineering & Administration
- Software Development & Computer Programming
- Systems Integration
- Wireless Technologies & Implementation

The Department of Computer and Information Technology (CIT) is accredited by ABET, Accreditation Board for Engineering and Technology, effective October of 2005. CIT offers two B.S. degree concentrations: Information Systems Technology and Network Engineering Technology. Both options are mapped out in detail on our website at:

<http://www.tech.purdue.edu/cit/academics/undergraduate/curricula/index.cfm>

The first two semesters are the same for students in either concentration. Students are not expected to make a concentration decision at first registration, but are urged to examine each plan of study and make a decision some time during the first year. Delays in a decision may lead to extra semesters for degree completion.

**Incoming students are expected to already possess:**

- ✓ **Personal Computing Literacy Skills.**  
[http://www.tech.purdue.edu/cit/contribute\\_downloads/posminpcskills.doc](http://www.tech.purdue.edu/cit/contribute_downloads/posminpcskills.doc)
- ✓ **Calculus Skills.** Two calculus courses are required for each B.S. concentration. If you feel that you are not proficient in calculus, you may take preparatory courses. Please note: preparatory courses do not fulfill any degree requirements.

**University Course Catalog:** <https://myPurdue.purdue.edu>

**University Schedule of Classes:** <https://myPurdue.purdue.edu>

**Current CIT West Lafayette faculty and areas of specialization:**Biomedical Informatics & High Performance Computing

Michael D. Kane, Chair  
Jeffrey L. Brewer  
Thomas J. Hacker  
John A. Springer

Computer Forensics

Marcus K. Rogers, Chair  
Richard P. Mislan

Database Management

John A. Springer, Chair  
Lonnie D. Bentley  
Dawn D. Laux  
Brandeis H. Marshall

Discovery Support Systems

Lonnie D. Bentley  
Thomas J. Hacker  
Michael D. Kane  
Eric T. Matson  
John A. Springer

End User Computing

Dawn D. Laux  
Julie R. Mariga  
Guity Ravai

IT Health Care

Jeffrey L. Brewer  
Kevin C. Dittman  
Alka R. Harriger  
Michael D. Kane  
Kyle D. Lutes  
Richard P. Mislan

Network Engineering Technology/Security

Phillip T. Rawles, Chair  
Melissa J. Dark  
J. Eric Dietz  
Raymond A. Hansen  
Anthony H. Smith

Software Development

Kyle D. Lutes, Chair  
Alka R. Harriger  
Eric T. Matson  
Alejandra J. Magana  
Guity Ravai  
Julia M. Taylor  
David M. Whittinghill

Systems Integration

Kevin C. Dittman, Chair  
Victor M. Barlow  
Lonnie D. Bentley  
Jeffrey L. Brewer  
Michael D. Kane  
Alejandra J. Magana  
Jeffrey L. Whitten

IT Energy Systems

J. Eric Dietz  
Eric T. Matson

Robotics

Eric T. Matson  
Julia M. Taylor

*Updated April 2012, Information Subject to Change*



## CIT Info Sheet (Page 2)

Faculty contact information and bios are available at: <http://www.tech.purdue.edu/cit/facultyandstaff/index.cfm>  
For more information on courses and areas of specialization, feel free to contact the faculty member directly.

### **CIT Scholarships Available:**

CIT Scholarships are available by applying through the College of Technology Scholarship application process. *(Incoming Freshmen are eligible and encouraged to apply.)*  
The application forms and deadlines can be found at: <http://www.tech.purdue.edu/Scholarships>.

Some recent donors to the CIT scholarship program include:

*Boeing, Caterpillar, Inc., CIT Alumni and Industrial Advisory Board Scholarship, CNA Foundation, Crowe Horwath, Eli Lilly & Company, Exxon Mobil, John Deere & Company, United States Steel Corporation*

### **Association of Information Technology Professionals (AITP) Student Chapter**

Students are encouraged to join AITP. For more information go to: <http://net1.tech.purdue.edu>

**CIT Career Placement:** Within six months of graduation, 95% of CIT students report employment. The average starting salary over the last three years is \$56,000.

**CIT Student Data:** Undergraduate enrollment is currently 450 students.  
An average of 90 freshmen are admitted each fall.  
CIT has over 3500 alumni

**Purdue Scholarships Available:** <http://www.purdue.edu/DFA/sandg.php>

**Campus Computer Purchase Agreements:** <http://www.itap.purdue.edu/shopping>

### **Information for Undergraduate Admissions - Students & Parents:**

[http://admissions.purdue.edu/Admissions\\_Criteria/Important\\_Dates.html](http://admissions.purdue.edu/Admissions_Criteria/Important_Dates.html)

*Apply as early as possible your senior year (August-October).*

### **Information about Purdue Computer Systems known as Information Technology at**

**Purdue(ITaP):** <http://www.itap.purdue.edu>

**Note:** Whenever possible, we post information to our website. Please make a habit of checking it often for updates and new information. <http://www.tech.purdue.edu/cit>

**Questions:** *If you have any questions that weren't covered or have questions in the future, please feel free to contact us.*

### **Contacts:**

CIT Main Office: (765)494-2560

Jeffrey Brewer, CIT Professor & Interim Department Head, [jbrewer@purdue.edu](mailto:jbrewer@purdue.edu) (765) 496-6838

Alka Harriger, CIT Professor & Associate Department Head, [harrigea@purdue.edu](mailto:harrigea@purdue.edu) (765) 494-2565

Linda Young, CIT Head Academic Counselor, [lyoung@purdue.edu](mailto:lyoung@purdue.edu) (765) 494-6484

Angie Murphy, Assistant to the Department Head, [armurphy@purdue.edu](mailto:armurphy@purdue.edu) (765) 496-6003

## Appendix B SAS Scripts

```

libname Diptixls 'H:\My Documents\Sem 04\Thesis Stuff\Data
Analysis\Survey_CompleteData.xls';
run;

data work.SCD;
    set Diptixls.'SCD$'n;
run;

proc print data= work.SCD(firstobs =1 obs = 5);
run;

proc freq data = SCD;
Tables Q3 / chisq;
run;

proc freq data = SCDQ3;
Tables Q3 *OrderPresntn / chisq;
run;

data SCDQ4;
    Set SCD;
    If OrderPresntn = 0 then do;
        output;
    end;
    else if OrderPresntn = 1 then do;
        If Q4 = 2 then Q4 = 1 ;
        else if Q4 = 1 then Q4 =2 ;
        output;
    end;
run;
proc freq data = SCDQ4;
Tables Q4 / chisq;
run;

proc freq data = SCDQ4;
Tables Q4 *OrderPresntn / chisq;
run;
PROC PRINT DATA = SCD;
RUN;
data SCDQ5_OP0 ; /* This only modified Q5_1, Q5_5 and Q5_6 ; and also
Q4 such that preference for website 1 set to 1 andthat for website 2
to 0 */
    Set SCD;
    If OrderPresntn = 0 then do; /* you prefer website 1 (New
website */
        If Q5_1 = 1 then Q5_1 = 5 ; /* STRONGLY AGREE takes 5 */
    else if Q5_1 = 2 then Q5_1 = 4 ;
        else if Q5_1 = 3 then Q5_1 = 3 ;
    else if Q5_1 = 4 then Q5_1 = 2 ;
        else if Q5_1 = 5 then Q5_1 = 1 ;/* STRONGLY DISAGREE
TAKES 1*/

```

```

if Q5_5 = 1 then Q5_5 = 5 ;
    else if Q5_5 = 2 then Q5_5 = 4 ;
    else if Q5_5 = 3 then Q5_5 = 3 ;
    else if Q5_5 = 4 then Q5_5 = 2 ;
    else if Q5_5 = 5 then Q5_5 = 1 ;

if Q5_7 = 1 then Q5_7 = 5 ;
    else if Q5_7 = 2 then Q5_7 = 4 ;
    else if Q5_7 = 3 then Q5_7 = 3 ;
    else if Q5_7 = 4 then Q5_7 = 2 ;
    else if Q5_7 = 5 then Q5_7 = 1 ;

if Q5_8 = 1 then Q5_8 = 5 ;
    else if Q5_8 = 2 then Q5_8 = 4 ;
    else if Q5_8 = 3 then Q5_8 = 3 ;
    else if Q5_8 = 4 then Q5_8 = 2 ;
    else if Q5_8 = 5 then Q5_8 = 1 ;

if Q5_9 = 1 then Q5_9 = 5 ;
    else if Q5_9 = 2 then Q5_9 = 4 ;
    else if Q5_9 = 3 then Q5_9 = 3 ;
    else if Q5_9 = 4 then Q5_9 = 2 ;
    else if Q5_9 = 5 then Q5_9 = 1 ;

if Q5_11 = 1 then Q5_11 = 5 ;
    else if Q5_11 = 2 then Q5_11 = 4 ;
    else if Q5_11 = 3 then Q5_11 = 3 ;
    else if Q5_11 = 4 then Q5_11 = 2 ;
    else if Q5_11 = 5 then Q5_11 = 1 ;

if Q5_14 = 1 then Q5_14 = 5 ;
    else if Q5_14 = 2 then Q5_14 = 4 ;
    else if Q5_14 = 3 then Q5_14 = 3 ;
    else if Q5_14 = 4 then Q5_14 = 2 ;
    else if Q5_14 = 5 then Q5_14 = 1 ;

if Q5_16 = 1 then Q5_16 = 5 ;
    else if Q5_16 = 2 then Q5_16 = 4 ;
    else if Q5_16 = 3 then Q5_16 = 3 ;
    else if Q5_16 = 4 then Q5_16 = 2 ;
    else if Q5_16 = 5 then Q5_16 = 1 ;

If Q4 = 1 then Q4 = 1 ;
else if Q4 = 2 then Q4 = 0 ;

output SCDQ5_OP0;
end;

run;

```

## Appendix C Qualtrics Web Survey Tool

## Qualtrics Web Survey Tool – Screenshot 1

**PURDUE**  
 UNIVERSITY

**Q1.**

Purpose of Research  
 The purpose of this research is to evaluate the usefulness and usability of a website that is able to customize its response to the prospective students' queries. You are asked to participate in this research because you are deemed as a prospective student to this university. If you're a freshman, you are more likely to closely understand/relate to a high-school student's interests while choosing a college major. You can therefore provide insightful inputs about the usefulness and usability of the website and help us evaluate and improve it.

Specific Procedures  
 Once you click on the consent form authorizing your consent to participate in the research study, you will be provided with links to two websites developed for prospective students that need information about college of technology at Purdue. You will be asked to navigate around the website/s and possibly distinguish between the differences in experiences of the two. After you have used the website, you will be asked to fill a brief online survey to evaluate the usefulness and usability of the tool.

Duration of Participation  
 The websites are available online and will take not more than 15-20 minutes to take a quick look at them. After you have satisfactorily explored the websites and tested some or all of the functionalities offered by it you will take 10-15 minutes to fill a brief online survey to evaluate the usefulness and usability of the websites. The survey however is anonymous and needs to be completed one time.

Risks  
 The risks are minimal and should not be different from participating in regular presentations or online surveys. The results of this study are intended to serve as a measure to evaluate the usefulness and usability of the website. The survey is anonymous and does not require any kind of contact information. The data you may enter on the website for testing will also be password protected and only you will have access to it at any point. Although very unlikely there are chances of breach of confidentiality. To minimize this risk the results of the survey are anonymous and are not linked with any subject.

Benefits  
 There are no direct benefits to you. By participating in the survey, you may provide valuable information to researcher communities who are trying to formulate ways to encourage interest in Science, Technology, Engineering and Math (STEM) areas. The inputs provided by you may be useful for evaluating the usefulness, usability and performance of the websites. The website/s may be improved to include any comments or suggestions you may provide.

Compensation  
 You receive no additional compensation for your participation.

Confidentiality  
 All records will be stored in computer files accessible to only the PI and the student investigator. This research data will be stored securely for a period of up to five years to support reporting activities from this and future related studies. In the event the data is no longer needed within this period, it will be destroyed.

Voluntary Nature of Participation  
 You do not have to participate in this research project. If you agree to participate you can withdraw your participation at any time without penalty.

Contact Information:  
 If you have any questions about this research project, you can contact Alka Harriger, Professor of Computer and Information Technology, Purdue University, via telephone (765-494-2565) or email (harrigea@purdue.edu). If you have concerns about the treatment of research participants, you can contact the Institutional Review Board at Purdue University, Ernest C. Young Hall, Room 1032, 155 S. Grant St., West Lafayette, IN 47907-2114. The phone number for the Board is (765) 494-5942. The email address is [irb@purdue.edu](mailto:irb@purdue.edu).

Documentation of Informed Consent  
 I have had the opportunity to read this consent form and have the research study explained. I have had the opportunity to ask questions about the research project and my questions have been answered. I am prepared to participate in the research project described above by clicking on the Accept button to proceed.


Do NOT Accept
ACCEPT

☐
☐


## Qualtrics Web Survey Tool – Screenshot 2

**PURDUE**  
 UNIVERSITY

**Q2. A glimpse of Website 1 for Quick Reference:**



**A glimpse of Website 2 for Quick Reference:**



**Q3. Did you find any difference in the two websites presented to you?**

☐ Yes

☐ No

**Q4. Which website, in your opinion, is better at doing its job to interact with prospective students?**

☐ Website 1

☐ Website 2

**Q5. Please select the appropriate option for the following questions:**

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
I think Website 1 was easier to use than Website 2.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would recommend Website 1 to a friend/relative.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would recommend Website 2 to a friend/relative.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel Website 1 was more frustrating to use than Website 2.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Website 1 could be easily navigated.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Website 2 is more visually appealing than Website 1.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Website 1 interface was more consistent compared to Website 2.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The information provided on Website 1 was useful and easy to understand.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There was more information about the Department of Computer & Information Technology and events at Purdue on Website 1 than Website 2.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There was more information about the Department of Computer & Information Technology and events at Purdue on Website 2 than Website 1.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There was more information on Website 1 about the activities at Purdue for diverse ethnic backgrounds than on Website 2.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The information provided on website 2 was useful and easy to understand.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I found useful information about different programs/initiatives at Purdue.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I could open all of the links I clicked on Website 1.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I could open all of the links I clicked on Website 2.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The interface on Website 1 assisted me when I made an error, if any.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Appendix D    Approved IRB Protocol and Amendment

### Approved IRB Protocol#1111011557

RESEARCH PARTICIPANT CONSENT FORM  
 Fostering communications with underrepresented groups who  
 submit inquiries to the College of Technology via the website  
 Alka R. Harriger, Professor and Associate Department Head  
 Purdue University  
 Computer and Information Technology Department



#### Purpose of Research

The purpose of this research is to evaluate the usefulness and usability of a website that is able to customize its response to the prospective students' queries. You are asked to participate in this research because you are deemed as a prospective student to this university. If you're a freshman, you are more likely to closely understand/relate to a high-school student's interests while choosing a college major. You can therefore provide insightful inputs about the usefulness and usability of the website and help us evaluate and improve it.

#### Specific Procedures

Once you click on the consent form authorizing your consent to participate in the research study, you will be provided with links to two websites developed for prospective students that need information about college of technology at Purdue. You will be asked to navigate around the website/s and possibly distinguish between the differences in experiences of the two. After you have used the website, you will be asked to fill a brief online survey to evaluate the usefulness and usability of the tool.

#### Duration of Participation

The websites are available online and will take not more than 15-20 minutes to take a quick look at them. After you have satisfactorily explored the websites and tested some or all of the functionalities offered by it you will take 10-15 minutes to fill a brief online survey to evaluate the usefulness and usability of the websites. The survey however is anonymous and needs to be completed one time.

#### Risks

The risks are minimal and should not be different from participating in regular presentations or online surveys. The results of this study are intended to serve as a measure to evaluate the usefulness and usability of the website. The survey is anonymous and does not require any kind of contact information. The data you may enter on the website for testing will also be password protected and only you will have access to it at any point. Although very unlikely there are chances of breach of confidentiality. To minimize this risk the results of the survey are anonymous and are not linked with any subject.



## Approved IRB Protocol Amendment



### HUMAN RESEARCH PROTECTION PROGRAM INSTITUTIONAL REVIEW BOARDS

---

<b>To:</b>	ALKA HARRIGER KNOY 243
<b>From:</b>	JEANNIE DICLEMENTI, Chair Social Science IRB
<b>Date:</b>	04/13/2012
<b>Committee Action:</b>	<b>Amendment to Approved Protocol</b>
<b>IRB Action Date</b>	04/11/2012
<b>IRB Protocol #</b>	1111011557
<b>Study Title</b>	Fostering communications with underrepresented groups who submit inquiries to the College of Technology via the website
<b>Expiration Date</b>	11/27/2012

Following review by the Institutional Review Board (IRB), the above-referenced protocol has been approved. This approval permits you to recruit subjects up to the number indicated on the application form and to conduct the research as it is approved. The IRB-stamped and dated consent, assent, and/or information form(s) approved for this protocol are enclosed. Please make copies from these document(s) both for subjects to sign should they choose to enroll in your study and for subjects to keep for their records. Information forms should not be signed. Researchers should keep all consent/assent forms for a period no less than three (3) years following closure of the protocol.

**Revisions/Amendments:** If you wish to change any aspect of this study, please submit the requested changes to the IRB using the appropriate form. IRB approval must be obtained before implementing any changes unless the change is to remove an immediate hazard to subjects in which case the IRB should be immediately informed following the change.

**Continuing Review:** It is the Principal Investigator's responsibility to obtain continuing review and approval for this protocol prior to the expiration date noted above. Please allow sufficient time for continued review and approval. No research activity of any sort may continue beyond the expiration date. Failure to receive approval for continuation before the expiration date will result in the approval's expiration on the expiration date. Data collected following the expiration date is unapproved research and cannot be used for research purposes including reporting or publishing as research data.

**Unanticipated Problems/Adverse Events:** Researchers must report unanticipated problems and/or adverse events to the IRB. If the problem/adverse event is serious, or is expected but occurs with unexpected severity or frequency, or the problem/event is unanticipated, it must be reported to the IRB within 48 hours of learning of the event and a written report submitted within five (5) business days. All other problems/events should be reported at the time of Continuing Review.

We wish you good luck with your work. Please retain copy of this letter for your records.

---

## Appendix E Survey Instrument

Pre-survey element 1:

Despite the announcement in the class, a survey participant was also presented with the disclaimer before beginning the survey that taking the survey is voluntary and they will not be penalized in any form if they chose to opt out of it. This ONLY question was mandatory. If a participant chooses to not take the survey he/she is redirected to the thank you/exit page. If he/she wishes to take the survey, they are taken to the next page that has the further-mentioned elements of the survey questionnaire.

Pre-survey element 2:

A glimpse of every website was show at the top of the questionnaire. This was to ease their experience of the survey to easily evaluate the website than relying on an individual's memorization ability to remember striking characteristics they spotted on each website.



Survey Questionnaire					
1. Did you find any difference in the two websites presented to you?  <input type="radio"/> Yes  <input type="radio"/> No					
2. Which website, in your opinion, is better at doing its job to interact with prospective students?  <input type="radio"/> Website 1  <input type="radio"/> Website 2					
	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree
<b>Usability</b>					
3. I think website 1 was easier to use than website 2.  (Tullis & Stetson, 2004)					
4. I would recommend Website 1 to a friend/relative.					
5. I would recommend Website 2 to a friend/relative.					

6. I feel website 1 was frustrating to use than website 2. (Tullis & Stetson, 2004)					
<b>Ease of Navigation</b>					
7. Website 1 could be easily navigated					
<b>Aesthetics</b>					
8. The website 1 is visually appealing than website 2. (Tullis & Stetson, 2004)					
9. The website 1 interface was consistent. (Green & Pearson, 2006)					
<b>Information Content &amp; Personalization</b>					
10. The information provided on the website 1 was useful and easy to understand. (Tullis & Stetson, 2004)					
11. There was more information about the Department of Computer & Information Technology and events at Purdue on Website 1 than on Website 2.					
12. There was more information about the Department of Computer & Information Technology and events at Purdue on Website 2 than on Website 1.					

13. There was more information on Website 1 about the activities at Purdue for diverse ethnic backgrounds than on Website 2.					
14. The information provided on the website 2 was useful and easy to understand. (Tullis & Stetson, 2004)					
15. I found useful information about different programs/initiatives at Purdue.					
<b>Control of Errors</b>					
16. I could open all of the links I clicked on Website 1.					
17. I could open all of the links I clicked on Website 2.					
18. The interface on Website 1 assisted me when I made an error. (Green & Pearson, 2006)					
19. The interface on Website 2 assisted me when I made an error. (Green & Pearson, 2006)					
20. Did you face an error while using the website or were stuck at any point?  Please answer yes or no.					
21. If you answered yes for question 20, how much would you rate the severity of this error (1: Least Severe, 5: Most Severe)?					

22. Please briefly list any features that you feel would enhance the usability of  Website 1.
23. Please briefly list any features that you feel would enhance the usability of  Website 2.