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The Perceptions of Globalization at a Public Research University Computer Science Graduate Department

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by

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DEDICATION

I would like to dedicate this dissertation to my mother, Sevgi Yildiz who taught me the value of hard work, commitment and sacrifice; and most of all, unconditional love.

ABSTRACT OF THE DISSERTATION

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by

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Based on a qualitative methodological approach, this study focuses on the understanding of a phenomenon called globalization in a research university computer science department. The study looks into the participants' perspectives about the department, its dynamics, culture and academic environment as related to globalization. The economic, political, academic and social/cultural aspects of the department are taken into consideration in investigating the influences of globalization.

Three questions guide this inquiry: 1) How is the notion of globalization interpreted in this department? 2) How does the perception of globalization influence the department in terms of finances, academics, policies and social life And 3) How are these perceptions influence the selection of students? Globalization and

neo-institutional view of legitimacy is used as theoretical lenses to conceptualize responses to these questions.

The data include interviews, field notes, official and non-official documents. Interpretations of these data are compared to findings from prior research on the impact of globalization in order to clarify and validate findings.

Findings show that there is disagreement in how the notion of globalization is interpreted between the doctoral students and the faculty in the department. This disagreement revealed the attitudes and interpretations of globalization in the light of the policies and procedures related to the department. How the faculty experience globalization is not consistent with the literature in this project. The literature states that globalization is a big part of higher education and it is a phenomenon that causes the changes in the goals and missions of higher education institutions (Knight, 2003, De Witt, 2005). The data revealed that globalization is not the cause for change but more of a consequence of actions that take place in achieving the goals and missions of the department.

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Chapter 1

Introduction

A 2009 report by the American Council on Education asserts that global transformations during the last decades have created remarkable changes in higher education in the United States (ACE, 2009). The impact of new communication technologies, increasingly international professions, national security issues, competition, international institutional networks and similar phenomena are subjecting the higher educational institutions everywhere to pressures for change (Altbach, 2001). These pressures are reflected in efforts by higher education institutions to make higher education responsive to the necessities and complexities of globalization (Van der Wende, 2001; Green, 2005; Knight 2003).

Globalization is defined as the flow of technology, economy, culture, knowledge, people, values, ideas, and goods among nations. Globalization influences each country in a different way as these flows interact with the nation's unique values, history, traditions, culture, and priorities (Knight, 2003; de Wit, 2005). Higher education institutions reflect the societies in which they are located and, therefore, are uniquely influenced as global changes interact with local settings (de Wit, 2005).

In response to globalization, higher education institutions, national governments, and local and international organizations are taking actions aimed at producing various expected outcomes (de Wit, 2005). Organizations have certain institutional missions and goals according to the needs of the institution. Organizations respond to globalization within the frame of the goals they have. For example, if the goal is to generate funds,

globalization could help in this goal by tapping into a larger source around the world; or if the goal is to have the most talented scientists, globalization can increase the pool of talented scientists. Therefore, this response to globalization is conceived as the way to achieve an objective that may be an outcome of quality, funds generation, or cross-cultural understanding. This outcome usually depends on the goals of the organization in question.

Higher education activities and policies can serve a wide range of objectives in the areas of economic, political, socio-cultural, and academic objectives. Global objectives might include such goals as increasing the number of fee-paying foreign students or grants, worldwide institutional recognition, the expansion of curricula and research activities to include a global perspective, global awareness in students' educational experiences, or bringing students and scholars from a global pool to participate in research (Van Damme, 2001). These objectives might also bring unintended consequences undermining local research areas, regulating prices as demand increases worldwide and inflation differs country by country, the fear that foreign students will replace the local ones or threats to national security as a result of research falling into the hands of individuals or groups with ill intentions (Borjas, 2004; Childress, 2007; Mok, 2007).

Students, faculty, and administrators are subject to global forces on a daily basis, which reshapes their economic, political, cultural-social and academic views and behavior (Suarez-Orozco, 2004; Armstrong, 2007). One of the challenges American universities, particularly publicly funded, land-grant universities face is pressure to

broaden institutional missions that have been historically tied to local geographies (Armstrong, 2007).

Statement of the Problem

The university department examined in this study is part of a publicly funded land-grant research university. The original mission of these types of institutions was to teach, conduct research, and serve the local community. However, in the last decades, there have been discussions of the importance of integrating global concepts into these universities' missions. The National Association of State Universities and Land-Grant Colleges Task Force published a report in 2004 stating the importance of state and land-grant institutions becoming more global in mission and programs. The report states "Missions must be reframed to include global as well as metropolitan and regional communities. Partnerships must grow in diversity, reach and location" (NASULGC, 2004, p. 5).

Given that the schools are social systems, and the society is becoming more global in its economical, political, social, and academic aspects, educational paradigms will likely become global (Scott, 2006; Knight, 2003; Green, 2005; Altbach, 2007). In a world where national borders are more and more permeable, American universities have been active in preparing their graduates to be global participants (Knight, 2003; Green, 2005). There have been several studies of globalization in higher education institutions such as the 2003 International Association of Universities (IAU) survey report identifying priorities and practices; the 2005 American Council on Education (ACE) report to measure internationalization efforts in research universities, and the 2007

report of the Association of International Educators (NAFSA) that profiles the practices in internationalization within U.S. colleges and universities (see also, Knight, 2003; Green, 2005). These organizational level analyses provide an overview of global participation in higher education institutions.

Globalization is real, but its meaning, content, and direction are given by people as they decide whether global changes are sources of creativity and learning, or competition and imbalance (Hayden, Levi, & Thompson, 2007). The perceptions of the global changes give the institutions and stakeholders an orientation to action. If globalization is perceived as a damaging force to the goals and practices of an institution or a field, internationalization will not be viewed positively. However, if the perceptions are favorable, changed policies and actions may be seen as necessary for the institution to reach its goals. Because higher education institutions are complex mechanisms of organizational behavior, and the assessment of globalization is not usually crystal clear, this dilemma may not be very obvious.

The change in the flow of international students, especially in the scientific fields yields an area of inquiry that varies by different perceptions. Higher education students traveled for centuries to get educated, this is not a recent phenomenon. However, with the recent exponential increases in the mobility of students in the world, higher education institutions are finding it necessary to respond to these changes. There are many documented viewpoints in the areas of competition, economical advantages, national security issues, and brain drain, brain gain issues in the perception of this flow.

Therefore, international student recruitment and admission processes become problematic when the stakeholders have differing views on this issue.

The effects of globalization are most prevalent in the fields of science and engineering in the United States. The U.S. awards the highest number of doctorates in these fields in the world, about 20% of all the world's doctorates. Computer science is highly internationalized; about 60% of all computer science doctorates are earned by international students in the U.S. (CRA, 2006). According to the Computing Research Association (2006), graduate level computer science programs in the U.S. depend on international students. Between 2002 and 2006, computer science field had the highest growth rate of all science and engineering fields with international students exceeding 60% (NSF, 2006). In the meantime, the employment outside the United States in computer science field is still not very strong and most of these students stay and contribute to the field in United States. The global student flows seem to favor the United States in the field of computer science.

The study reported in this dissertation differs from the previous studies in its conceptual approach to globalization. It both focuses on analyzing globalization at the university department level and interprets departmental activities utilizing rich textured qualitative inquiry. The unit of analysis is the department itself within a specific university. The study investigates the globalization phenomenon as perceived by the players in a particular department. The assumption is that there is an ongoing interaction between the people and the notion of globalization by the virtue of the fact that there are more international people than domestic ones that make up of the department. Several

dimensions of globalization surfaced in various studies, and the ACE study in 2005 identified the common political, social, economic and academic dimensions of globalization among institutions (Green, 2005). This study will use these dimensions as a framework for understanding globalization.

Concerning the second point, the mode of analysis, a phenomenological approach will be used to analyze the institutional elements as they arise from the players' points of view (Kondakci, Van den Broeck, Devos, 2006). Most of the studies in this area have been statistical analyses of survey results examining the patterns identified by variables (Biddle, 2002; Knight, 2003; ACE, 2004; Green, 2005; NAFSA, 2007). By taking a qualitative approach, I will be able to examine the experiences of the actors in a particular environment to make sense of the data inductively.

The Research Questions

The main questions guiding this research project are "How does a computer science graduate department of a public university interact with the phenomenon of globalization, and how do the people that make up the department respond to this phenomenon?"

The research concentrates on how the people in the department, namely the faculty and the students construct the meaning of globalization in this specific environment. This open ended, general question focuses on how the experiences in a particular department shape the perception of a phenomenon called globalization. Although globalization is a multi-faceted word, for this project, as explored in the literature review, the meaning is limited to globalization in higher education

specifically. Economic, political, social, and academic lenses will be used to analyze the results. Through this study, I sought specific factors related to globalization that influence the meaning-making process, and how these understandings are reflected in the decisions made by the department.

It is important to more narrowly specify this question as it requires a large area of investigation. The reviewed literature will help us answer the following questions in order to give the research question direction and focus.

1- What aspects of globalization are relevant for this project?

2- Where do we find these aspects in a higher education institution? A department?

3- Why is the field of computer science relevant for such a project?

4- What kinds of decisions are influenced by these aspects in a department?

5- Where do we need to look in order to understand the influence of the perceptions of globalization?

6- What is the structure of a university department and what forces influence decisions?

7- What are the relationships of globalization and these forces?

In other words, we are looking at the computer science department of a public research university to see whether we can find out about the influences of globalization.

Purpose of the Study

The purpose of this research project is as follows:

1- To understand the formal and informal organizational structures in the context of a department

2- To provide a rich description of the computer science department; its dynamics, culture, and academic environment as related to the research question.

3- To understand the interactions of people with the concept of globalization, its implications in this specific environment, and the consequences resulting from this interaction.

The questions this study asks are motivated by a desire to discover what globalization means to this department, and how we can identify what it means to the department. If we can identify the interactions of the people with the concept of globalization, and interpret these interactions, we can see how influential the concept of globalization is for this department. We already know there are institutional efforts to respond to globalization in higher education identified as internationalization, and there are certain criteria to describe it. By identifying the rationale for the actions and behavior of people that make-up of the department, we can see if this department's actions validate literature on the subject, add to it or challenge it. This project will be helpful in addressing the general issues of:

How meaning is constructed? Meaning refers to how a symbol or utterance is interpreted. Meaning is subjective in the sense that it appeals to an expectation, a way of

relating to things. In cultural context, it is socially constructed through negotiation (Alvesson, 2002). Bourdieu claims that meaning-construction is a process of far greater complexity and tried to establish the relationship between habitus (a set of acquired patterns of thoughts and behavior as a result of experiences) and practical or common sense view (Bourdieu, 1977; MacLeod, 1995).

How decisions are made? People employ strategies through the meaning making process. The strategies of action enable people to develop solutions to the problems they encounter. These strategies vary according to the cultural background and also the context in which the meaning is negotiated (Swidler, 2001). Decision making can be seen as a product of these negotiations that guide our selection of an action among several alternatives. Every decision making process produces a final choice in terms of an action or an opinion of choice (Reason, 1990). The context in which decisions are made will be relevant in this choice.

Institutional elements in the perception of globalization and internationalization. What institutional elements come into play in the operational arena where decisions are made? The phenomenon of globalization in higher education can be framed through four areas of reasoning clustered around political, economic, academic, and social-cultural dimensions (Knight, 2004; ACE, 2005). Looking at the governance, operations, services, and human resources of the particular department, what consequences of globalization are noted in these areas?

Why this Specific Department?

Computer science by definition is the study of the storage, transformation, and transfer of information and is usually considered to be a branch of engineering (Linux, 2006). The progress in computer science and engineering, more than any other discipline, is responsible for the globalization in science (Cole, Fortes & Klinger, 1998). Advances in these areas have created a worldwide information network that encourages collaboration.

Computer Science is one of the top three areas that international students seek to study at a graduate level in the U.S. (Koh Chin, 2006). The reasons for that include the worldwide prestige of the United States computer science education (Marginson & Van der Wende, 2007). The computer science department of the university to be studied has a high number of international students and scholars. Apart from this fact these students and scholars have already crossed borders and participated in globalization by the way of adapting and learning different ways of education, communication, and way of living. Because of these characteristics, one of the assumptions of the study is that these individuals are aware of the international context of their studies as well as the phenomenon of globalization in higher education.

Another reason that I believe globalization is relevant to this department is the global advancements in terms of software and hardware developments and networking. Global development is a real concern in computer software development meaning that software needs to be compatible around the world in order to be marketable. In software engineering terms this concept is called ‘internationalization’. A similar concept

'localization' of software deals with culturally specific instances adjusted to the target market (Gross, 2006). There are also shared internet devices such as games, reference materials, entertainment options that are used worldwide that require international knowledge particularly relating to computer technology.

Why this University?

Apart from the practical reasons such as access to location, this particular public research university is located in a state where all research universities have a high presence internationally (IIE, 2007). Through various programs such as international student recruitments, research collaborations, and satellite campuses, these universities compete to be global attractors on both institutional and academic levels (ACE, 2004).

This particular university has created and implemented new models for the more effective internationalization of doctoral education. For example, the Integrative Graduate Education and Research Traineeship (IGERT) program funded through National Science Foundation (NSF) provides a model for graduate education and training for collaborative research that goes beyond traditional disciplinary and national boundaries (NSF, 2006).

In addition, this particular university system has a mission statement of internationalization articulating the strategies "to provide leadership for international innovation, learning, and commitment for the benefit of California, the nation, and the international community; to enhance the faculty and students' knowledge and skills for success in diverse, multi-cultural environments and for responsible, global citizenship; and to extend the University's public service mission worldwide" (2007).

How Does the Methodology Help Answer the Question?

Carr and Kemmis distinguish among three basic forms of educational research as positivist, interpretive and critical (1986). In poitivist research, the knowledge is generated through quantifiable delivery system thrsough confirmation of theories and hypothesis testing (Car & Kemmis, 1980; Schunk, 2008). Reality in this view is observable and measurable (Merriam, 1998). In interpretive research, experience is considered to be a process and understanding the meaning or experience represents the knowledge from an inductive hypothesis or theory generating rather than deductive testing mode of inquiry (Merriam, 1998). In critical theory, drawing from Marxist philosophy, knowledge gained is an 'ideological critique of power, privilege and oppression' (Merriam, 1998, p. 4)

The question of how a computer science department interacts with the phenomenon of globalization is best studied through qualitative interpretive methodology because the focus in this project is not to prove or disprove a theory but rather to focus on the process meaning and understanding of a phenomenon. In this perspective, my interest lies in discovering what factors differentiate globalization from the actors' perspectives to what is happening in the department.

If this study were to be a positivist one, I could begin by hypothesizing that this department indeed responds to globalization (or not). I could then design a study controlling for as many variables as possible established from the literature and then measure the results in to what degree globalization exists in the department according to the variables. But this is not what I am looking for. I am interested in revealing the

people's interactions with the concept of globalization and how their interactions influence their decision making. This would bring an in depth understanding of the happenings in that particular environment.

The results then could be useful to anyone investigating globalization in the departmental level giving a particular view. People who are familiar with the department could have a more detailed picture of the happenings from a different perspective, making the 'familiar strange'. That is, they might see components that they never considered before. At the same time, people who are not familiar with the department or its connection to the phenomenon of globalization could have a glimpse of what is happening making unfamiliar occurrences familiar (Spindler & Spindler, 1982).

Assumptions

The theoretical framework for this project draws from a variety of fields. Globalization is viewed from economic, political, social/cultural and academic perspectives and is the guiding theory for the meaning making process being analyzed. (Knight, 2004; Green, 2005). The department's interaction with globalization is assumed by the virtue of the number of international people within the department (2003; ACE, 2004; Green, 2005; NAFSA, 2007; UCR, 2008). Thus, the experience of globalization is assumed to be relevant to the study of this department.

Another assumption is that higher education is institutionally considered from a perspective that an "institution" is to be distinguished from an organization. Powell and DiMaggio (1991), through the development of a neo-institutional perspective, added to

the traditional definition of ‘institutions’ within sociological theories of organizations; the neo-institutional viewpoint rejects rationality and situates our understanding of institutions through cognitive and cultural explanations of organizational structures:

> “The new institutionalism in organization theory and sociology comprises a rejection of rational-actor models, an interest in institutions as independent variables, a turn toward cognitive and cultural explanations, and an interest in properties of supra-individual units of analysis that cannot be reduced to aggregations or direct consequences of individuals’ attributes or motives” (p. 8).

Considering the department as an institutional unit is helpful in analyzing the structure of the department.

According to Scott (2001) institutions refer to entities that are regulated and are composed of cultural-cognitive elements that give meaning to social life. Institutions are conveyed by a choice of systems, including symbolic systems, relational systems, routines, and artifacts. Most of all, institutions by definition “are subject to change processes, both incremental and discontinuous” (Scott, 2001, p. 48).

Limitations and Delimitations

A limitation to the study is researcher bias. Validity of the study is limited by the skills of the researcher in conducting and interpreting findings. The researcher has a certain perspective arising from her own experiences; the interpretations and analyses are limited to the scope of her experiences. The status of the researcher as a graduate student also limited the researcher having access to certain faculty and departmental meetings.

Another limitation is that the participants in the study are limited participants. For a project with limited time and resources, interviewing all the people in the department was not possible. A broader perspective could have included more participants and a longitudinal study to interview each participant several times.

The delimitation was the perspective of examination being limited to neo-institutional analysis of attitudes and behavior in the department. In-depth psychological or social analysis was not a part of the explanation of findings in this study.

Definition of Terms

The following vocabulary is prevalent throughout the current study.

Globalization. This term is considered in its general sense. It is the practice of growing interdependence between people of the world economically, socially, culturally, politically, environmentally, scientifically, and technologically (Tomlison, 1999; Knight, 2003; Marginson, 2007).

Internationalization. This term is used as it applies to higher education in this study. Knight (2003) has proposed the following definition: internationalization at the institutional levels is defined as "the process of integrating an international, intercultural, or global dimension into the purpose, functions or delivery of postsecondary education"(p. 2). It may be used interchangeably with international education or transnational education.

International students. In this study, international students are identified as students who are not citizens or permanent residents of the U.S. and that they hold a visa

to be in the United States. They may also be called foreign students or visa students. All foreign-born students are not international students as some might have been naturalized over the course of their stay.

Institution. It is a unit that is regulated and is composed of cultural and cognitive elements that give meaning to social life. Institutions are expressed by a choice of systems, including symbolic systems, relational systems, routines, and artifacts (Scott, 2001).

Higher Education Institution. It is an institution that is accredited by a nationally recognized agency that is legally authorized to provide education beyond secondary education (USDE, 1998).

Research University. The research universities in United States are defined as institutions of higher education that has the primary purpose of expanding research and committed to doctoral education through the doctorate degrees offered (Carnegie Foundation, 2008).

Computer Science. The science that deals with the theory and methods of processing, storage, transformation and transfer of information; in addition to the design of computer hardware and software. It has its roots primarily in the fields of electrical engineering, mathematics and linguistics. Although its name contains the word science, computer science is usually considered to be a branch of engineering (Linux, 2006; Rojas, 2001).

Qualitative Research. Qualitative research seeks answers to questions regarding how social experience is created and given meaning (Erickson, 1986). It tries to

> achieve a comprehensive understanding of human behavior and the reasons for such behavior (Bogdan & Biklen, 1982). Qualitative researchers investigate the why and how of decision making and behavior (Goetz & LeCompte 1984). Other terms sometimes used interchangeably are interpretive research, inductive research, ethnography, phenomenology, field study and naturalistic inquiry (Merriam, 1998, p. 5).

Organization of Study

Chapter 1 provides the reader with a basic understanding and broad overview of the research project including the introduction and statement of the problem, explanation of the research question, the purpose of the study, rationale for selecting the site, assumptions, limitations and delimitations and the definitions of prevalent terms throughout the study. The purpose of Chapter 2 is to review the relevant literature in the areas of globalization, internationalization, university departments, computer science discipline, the international graduate student flow and neo-institutional look at legitimacy. The literature review provides the readers the necessary background in the analysis of the findings and an in depth understanding of concepts related to the research. Chapter 3 focuses on the methodology of the study which describes the reasons for choosing the methodology, sample and population, site selection, instrumentation, validity and reliability, the role of the researcher, the interview procedures and the data analysis. This is the roadmap of how this study actually took place and what methods were utilized in collecting and sorting data. Chapter 4 presents findings in response to the research questions and portrays the results of the data

gathered. And finally Chapter 5 presents a discussion of the findings, summarizes the study and discusses implications of the study for future research.

Chapter 2

Review of Literature

This chapter reviews the literature on globalization, internationalization, university departments, computer science as an academic discipline, international student flow and the concept of legitimacy in neo-institutional view. The first review distinguishes globalization from internationalization. The four areas of globalization economic, political, social/cultural and academic are explored in general and in the light of higher education (Knight, 1997, 2004; ACE, 2005; Green, 2005). This section gives a detailed account of the differences between globalization and internationalization as indicated in the literature. The next section, on university departments, gives information about the structure and government of university departments, and gives the readers information about the institution where the study takes place. A third section reviews literature about the computer science discipline which is the academic program in the department. From this information, the readers can get an idea about the discipline's historical evolution, as well as its relevancy to the subject of globalization. The following section explains the flow of international students in the world in general. Information and trends about student flows in the world gives the readers necessary background for understanding the details of where, why and how the students come and the popular topics of studies for these students in general in US universities. The last section in this chapter is a review of literature on legitimacy in neo-institutional view which provides a viewpoint in analyzing findings.

Globalization versus Internationalization

Higher education is rapidly evolving globally following the trend of other industries (Naidoo, 2006). The influence of 'globalization' and 'internationalization' has become a key theme in higher education (Enders, 2004; van der Wende, 2001). Unfortunately, the more frequently these terms are used, the more their meanings get mingled (Enders, 2004). There remain some fundamental differences between these terms, however, globalization, apart from being a buzz word in mainstream media, is an inherently widespread and complicated phenomenon (Carnoy & Rhoten, 2002). Similarly, even though 'internationalization' is a popular and frequently employed concept—in varying contexts and for diverse purposes, it certainly remains vague and unclear (Knight, 1999; Stier 2003; Yang, 2002). Yet, Knight (1999) helps us to clarify two distinct albeit related definitions for the terms: "globalization can be thought of as the catalyst while internationalization is the response, albeit a response in a proactive way" (p. 14).

Let us look further into this explanation. In Knight's view, globalization refers something that is happening on all levels and internationalization refers to the action taken in response to this phenomenon (Knight, 1999; Dudley, 1998). However, we need to get into more detail in order to understand why these two concepts are not as simple to distinguish as stated.

Globalization

Although the term 'globalization' has been around since the early 1960s, it is the last 20-30 years that really shaped the definition. Tomlison, (1999) in his book

"Globalization and Culture" argues that globalization refers to the world as a single place that serves as a frame of reference to everyone. This notion is shared by many authors including Robertson, who was the first author to use it in the title of a sociological article in 1985 (Currie, 1998). Robertson defined globalization as a compacted world where time and space are compressed (Currie, 1998; Harvey, 1989). Globalization also refers to the interconnected world, global mass culture that is more often known as "the global village" (McLuhan, 1964; New World Encyclopedia, 2007), a certain place. Higher education is at the center of this compressed world (Suarez-Orozco & Qin-Hillard, 2004). The essence of globalization is contained in a new way of thinking regarding space and time (Carnoy, 1999) and higher education institutions mirror this new way of thinking (Suarez-Orozco & Qin-Hillard, 2004). Geographical distance is more and more measured in time. As the time necessary to connect distinct geographical locations is condensed, distance or space undergoes compression (Tomlison, 1999). As the way knowledge is delivered changes, higher education institutions are increasingly in the position to adapt and respond to these changes (Carnoy, 2005).

There is also another view of globalization which is globalization as a 'process' (Morrow & Torres, 2000; Giddens, 1994; Rizvi, 2004; Altbach, 2001, Beerkens, 2003; Armstrong, 2007; Spring, 2008). As a process, globalization is defined as the practice of growing interconnectivity and interdependence between people of the world economically, socially, culturally, politically, environmentally, scientifically, and

technologically (Tomlinson, 1999; Levin, 2001; Marginson, 2007). This type of interdependence has been described by Castells as a "network society" (1997).

Globalization in both these views is a phenomenon that has been happening to the world for a long time, but recent technological advancements, especially considering the increased speed in the areas of communication and transportation create a new framework for human action (Tomlinson, 1999). Beerkens (2003) writes that the term global can be approached as a "geographical concept distinguishing it from local, as a concept of authority distinguishing it from territorial sovereignty, as a cultural concept distinguishing it from isolation, and finally, as an institutional concept distinguishing it from national" (p. 130). Knight (1997, 2004) introduces four grounds for globalization: economic, political, academic, and cultural/social aspects that replace the notion of isolation particularly in these fields.

Economic Globalization

Economic globalization refers to the observation that in recent years a rapidly rising share of economic activity in the world seems to be taking place between people who live in different countries (World Bank, 2000).This growth in cross-border economic activities takes various forms. First is known as international trade which denotes a growth in overall importing and exporting between various countries including developed and developing countries (World Bank a, 2007). The second form is Foreign Direct Investment (FDI) which means firms in developed countries make investments and run operations in other countries. Overall, the FDI flow increased tenfold between 1990 and 2005 (World Bank, 2007). The third flow shows increasingly

globally diversified portfolios which are called capital market flows. This means that people who own financial assets and people who borrow funds are looking more and more into foreign markets (World Bank, 2007). Money that flows in the world is now interconnected to many sources and not isolated to each country's market. This allows many countries to expand and develop their money markets, however, any market meltdown, as experienced in 2008, also influences countries globally.

Educational institutions are also following the trend in economic globalization that centers on a consumerist mentality in which education is positioned as a product exchangeable in an open market (Marginson & Considine, 2000; Altbach, 2004, Slaughter & Rhoades, 2004). Slaughter and Leslie argue that "the academy has shifted from a liberal arts core to an entrepreneurial periphery," in which "marketization" of the academics leads to the rise of "research and development with commercial purpose" (1997, p. 208). This commercial purpose allows higher education institutions to compete for the monetary or human resources available globally to benefit their institutions (Slaughter & Rhoades, 2004).

Academic Globalization

Academic globalization constitutes of a wide variety of components including higher education institutions, the academic fields, scholars, and students as contributing factors. These components each hold a different position in the identification of academic globalization.

The institution of higher education has always been international in scope with the exchange of ideas, scholars and students, but modern technology, the internet,

communication technologies, the increasing flow of students and highly educated scientists from all over the world as well as scientific investments, patent activities and R & D make globalization more visible in the scientific field today (Heylin, 2006). According to OECD factbook (2008), Research and Development covers three activities: basic research, applied research, and experimental development. Therefore, any research collaboration could be identified as a part of R&D. The arrival of computer networks and systems, and the challenges they bring cannot be solved without international collaboration, such as adapting software usage around the world, the internet not having a single owner, overcrowding of the internet and selection of knowledge. At the center of these challenges are current national and international policies. For example, the patent building or R&D spending and trans-national collaborations (this is an incomplete sentence). As the concern over scientific issues increase, we see more and more higher education institutions increasing research in these areas (Jenkins, 2003).

Science has long been considered globalized in many ways. For example, chemical tests are standard in laboratories around the world. Some large telescopes are constructed involving several governments. Although there are many languages in the world, mathematical symbols and formulae are the same in all languages (Martin & Richards, 1995). Students move to other countries for training; researchers join forces internationally and may find jobs in other countries. Most prominent scientific journals accept submissions from any part of the world and try to apply universal criteria in

reviewing them (Martin, 2007). For these reasons alone, globalization in higher education and science is interconnected.

Technology is not the cause of the scientific changes we are living through. But without new information and communication technologies, the changes in our lives would not be possible (Castells, 1999). There are many ways technology influences academic globalization. For one thing, technology results in the acceleration of productivity growth. This occurs where industrial processes are transformed by various forms of technology such as nanotechnology, biotechnology, biometrics, network technology, and information technology (Taylor, 2001). The increase of technology brings the need for a more educated work force. Higher education institutions are transformed by this need (Carnoy, 2005). There has been a significant increase in high-tech programs and graduate education in science and engineering in the U.S. in the last 10 years (Green, 2007). The increase is even more prominent in science and engineering students that are temporary visa holders (Oliver, 2007).

Social/Cultural Globalization

Technological and economic changes have an influence on social and cultural structures. Globalization has created a new social environment (Kellner, 2002). This social environment has been described in terms of 'the widening, deepening and speeding up of world-wide interconnectedness in all aspects of contemporary social life' (Held et al., 1999, p. 2). It is a process which symbolizes a transformation in the spatial organization of social relations and connections. These connections can be evaluated in terms of their amplitude, strength, speed and impact generating global or local flows

and networks of activity, interaction, and the exercise of power (Held et al., 1999). Social groups get closer together but at the same time persistently try to maintain a more intentional focus on their localized identities (Chaney & Martin, 2004; Knight 2004; Yang, 2002) In social and cultural perspective, globalization can be seen as a double-edged sword. Chomsky refers to globalization as international integration (Chomsky, 2006). This simple explanation can hold divergent worldviews socially and culturally. For example, globalization can bring people who share certain beliefs, professions or causes together such as the professional cultures, Turkish pop music fans, holocaust survivors, Muslim extremists or human rights activists to form new forms of societies. At the same time, as the national communities get more pluralized, cultural and economic differences can form divisions among the people who share the same locality (Cevre, 1995; Hannerz, 2004).

Political Globalization

The political arena of globalization cannot be separated from social, cultural, and economic forces that shape the state's position. While global processes are often seen as beyond the control of nation-states, the role of the state has remained key in the expression of social interests and representation of social groups or classes that benefit or suffer from public policy formation in response to globalization (Shaw, 1999; Morrow, Torres, 2000). As the control of the economy is transferred from the public to the private sector which is broadly the main argument of the neo-liberal economic agenda, there has been a shift in the political platform of institutions (Cohen, 2007). Higher education institutions that pursue an institutional integration to the new

economy have benefited from these political processes (Slaughter & Rhoades, 2004). An example of this can be seen in many states having legal requirements that faculties reveal patentable findings of research to make certain that colleges and universities have the opportunity to review them for commercial possibility (Chew, 1992).

Another feature of globalization on institutional policies is the cross-national policy borrowing by institutions and forming international policies among institutions (Lingard, 2000). Appadurai argues that the policy ideas flowing globally are also linked to international political organizations such as the EU, World Bank, IMF, UN, UNESCO and OECD (1996). These organizations or systems are largely institutionalizing mechanisms and they represent "a complex and ungovernable web of relationships that extends beyond the nation state" (Lingard, 2000; Waters, 2001).

Globalization in Higher Education

Armstrong (2007) introduced a new conceptual framework through which to examine the impact of globalization on US higher education institutions. His framing of the process of globalization in the international arena sees higher education institutions as hubs. Armstrong depicts a new model of institutions where students and faculty earn degrees from various international locales through global partnerships and satellite campuses thereby categorizing such institutions as non-traditional in the sense that they have no geographical borders.

In this sense, institutions branch out and become global as opposed to just exchanging people and scholars with a fixed location. They expand their concept of being global as having international students, curriculum and activities, and having

study abroad programs to a different order of having programs overseas which rely a great deal on the partnerships between the people from different educational institutions around the world (Armstrong, 2007; Scott, 2000).

Globalization and Research Universities

When exploring globalization especially in the academics, we see that research universities play a particular role with global competition and high number of international students. Armstrong & Becker (2004) discuss in a lecture series on the subject of Higher Education and the Global Marketplace, the present situation, the emerging environment, and future positions of US research universities. Altbach and Knight's (2007) article discusses the motivations behind the global activities of research universities.

Armstrong and Becker explain the high cost associated with supplying research, instruction and social environment for students in undergraduate, master, and doctoral programs serving mostly traditional students (2004). Traditional students are identified as the ones that study on campus. Education in these universities is seen as investment in the future of a private market economy. Therefore as the global economy depends on skilled workers, the need for educating more people to participate in this economy gains importance (Armstrong & Becker, 2004).

Altbach and Knight discuss the motivations of research institutions to participate in the global arena in a different light. They explain the motivation of expansion also includes enhancing research knowledge and capacity as well as to increase cultural awareness in these organizations (Altbach & Knight, 2007). Both articles stress the

point that the higher education institutions, particularly research institutions that participate in the global arena do so not only with the traditional ways of having international students and curricula, but also expanding to different locales in the world by branch campuses and online collaborations.

In this brief analysis of globalization, we can see that the wide-ranging interconnectedness trends are evident, and they directly have an influence on higher education institutions (Altbach, 2004). Many of these institutions, however, struggle as they have to respond to an ever-increasing set of global challenges such as competition or handling increasing international populations while remaining confined by institutional structural principles passed on from an earlier, more state-centered world (Najam, Runnalls & Halle, 2007). Academic systems and institutions try to accommodate these developments in different ways; internationalization is one way of responding to globalization (Altbach, 2001).

Internationalization

Internationalization in the higher education field cannot be understood without taking into consideration of such factors such as globalization (in all aforementioned aspects), international educational systems and national and institutional policies (Knight, 1999). The critical point is to come up with a definition that would encompass all aspects of education and the role it plays in society. With this in mind, Knight proposed a working definition of internationalization as “internationalization at the national, sector, and institutional levels is defined as the process of integrating an international, intercultural, or global dimension into the purpose, functions or delivery

of postsecondary education" (Knight, 2003, p. 2). This simple and succinct definition gives direction to this highly flexible concept of internationalization for this project.

Internationalization is not new to the higher education field. Since the medieval times, universities have been internationally oriented. For example, academics and students moved from Cairo to Bologna to Oxford in order to take advantage of the academic elites of those days (Stier, 2003). We can say that international education has its roots in academic mobility of students and scholars. (Scott, 2006). Scholarly exchange of students and academic people who are involved with research was the main part of internationalization of universities in history (Vestal, 1994). During congressional hearings on the International Education Act (IEA) of 1966, there was a consensus that internationalization of education has at least three major areas: movement of scholars and students seeking training and research, curricular content, and structural arrangements that provide cross-border technical assistance and educational cooperation programs (IEA, 1966). In 1994, Kerr, Gate & Kawaoka identified four main strands of internationalization: The flow of international students, faculty members, information and curricular content (1994). In research reports prepared for ACE (2002) and International Association of Universities (IAU) (2003) concerning internationalization of higher education practices, the identifying factors included international mobility of students and educators as one of the main descriptors of internationalization (Knight, 2003). Knight (1999) mentioned that internationalization can be viewed as an active response to globalization.

During the Cold War, the motivation behind internationalization in United States higher education institutions was highly political and contradictory. Although the drive for internationalization was seen as a sign of American imperialism by the rest of the world; US policymakers' presentation was on the lines of an initiative for peace and mutual understanding (de Wit, 1995). This view of international education as a force for peace has been a dominant one in US politics and higher education over the past 50 years. Since World War II, the political rationale has been the dominant one in initiatives to internationalize higher education. But with the end of the Cold War, political emphasis slowly gave way to an economic rationale (Knight, 2003).

Economically, there is an argument that globalization is changing the goals of higher education in order to mirror markets. This notion is labeled as "academic capitalism" to symbolize a systematic creation of policies to make marketable activities possible, changes in the connections with the states, private organizations to support research; basically a change that prioritizes potential revenue generation rather than general expansion of knowledge (Slaughter & Rhoades, 2004). This change in the establishment of higher education institutions can be interpreted as a result of economic globalization. Advanced knowledge is seen as raw material that can be owned, marketed and sold. In addition, rising private corporations need well educated workers that influence the curricular selections (Schmidt, 2002; Slaughter & Leslie, 1997).

Technology has a profound impact on the way we live our lives. Higher education institutions are influenced by this impact (Carnoy & Rhoten, 2002). There are a couple of major areas that explain the influence of technology on higher education.

For one thing, (increased technological sophistication drives a need?) for highly trained individuals. This significantly increases the need for more higher education institutions around the world, or causes a flow to the countries that have higher education institutions that would fill this need (Altbach, 2004; Marginson, 2007). Another impact of technology can be observed in knowledge transmission. The effect of knowledge transmission on higher education is twofold. One, technology increases the availability of knowledge. As mentioned earlier, in a knowledge-based economy, knowledge creates economic value. For example, it is not the compact disc which costs a few cents that drives the price of software to soar to several hundred dollars, it is the information contained in it (Hooker, 1997). In addition, higher education institutions try to keep up with the technological changes by providing high-tech support which requires finances. In order to gain financial support, higher education institutions must keep their prestige by continuing to have the very best talents even if it means recruiting from overseas. Higher education institutions also have agreements with industry through various businesses research and development partnerships? (Marginson & Considine, 2000; Slaughter & Rhoades, 2004). An effect of technology and the availability of knowledge transmission on higher education is seen through spatialization. The term 'spatialization' was used by scholars Wallace & Brady to indicate the application of advanced digital technologies resulting in work that is no longer bound to a particular geographical location (Mitchell, Yildiz & Batie, 2007; Wallace & Brady, 2001). We can see the effect of this through distance education. For example, the number of students Anadolu University has in Turkey reportedly more than doubled in the last decade and

now has now more than a million students (International Center for Distance Learning, Anadolu University). The University of London and Stanford University are also in the top ten of distance education universities in the world each with students living in over 180 countries (ICDL).

According to Parsons, schools, are a part of society, therefore they mirror society (1959). This can be applied to higher education institutions as well. If society is experiencing an influx of change, we expect educational institutions to reflect these changes (Brint, 2006). Internationalization of higher education may be viewed as a means of changing the world by increasing understanding through bringing together people from many different countries, a kind of cultural convergence (Blackman, 1993). Higher education institutions already bring a diverse population of students together in terms of academic interests, talents, personal backgrounds and interests within a society. With the effects of globalization, bringing together diverse minds in a society is further expanded into other cultures and countries. Therefore, institutions of higher education increase their efforts to make way for this expansion through more international oriented programs, policy changes, and scholarly exchanges throughout the world. Studies have identified that in order to give way to cultural convergence; institutions must consciously increase their internationalization efforts (U.S. Department of Education, 1979; Clarke, 2004). Consequently, internationalization processes provide ways to adapt to the changes occurring because of globalization in the institution. By having a chance to share cultural differences or personal similarities by studying in the

same academic fields, people from distant locations in the world converge cultures in the same institution (UNESCO, 2004).

In U.S. higher education institutions, international activity is most prevalent in science and engineering departments, especially at the graduate level (NSF, 2006; Regets, 1999). One of the explanations for this activity could be that the laws of nature are the same anywhere in the world and do not change from nation to nation. It is for this reason that although there may be different national styles in the organization of science, most scientific researchers communicate with each other on a global scale (Regets, 1999; Arber, 1999). Historically, science has always been one of the means to transcend political barriers. International students who finish their studies in the U.S. often become part of networks in the U.S. or their home countries adding to the global knowledge as well as forming collaborations (Griffiths, Agnew, Armstrong, Freeman, Gast, Moses, Neureiter, Paul, Preston, Reichmanis, Richardson, Siegel, Stephan, Teitelbaum & Wake, 2005).

University Departments

Departments in universities are the essential building blocks of the American university and they are fairly autonomous organizational units (Walvoord et al, 2000). Hecht, Higgerson, Gmelch and Tucker argue that in order to understand higher education, it is essential to look closely at the life of academic departments (1999). They are central to understanding the 'realities of academic life' (Siskin, 1994, p. 15). Pfeffer and Salancik (1980) have stressed that departments are administrative units with policies and procedures distinguished from each other in the context of not only the

institution, but also the fields they represent. In this sense, departments tend to develop their own languages, norms, organizational culture, orientation to time and perspectives of the mission and goals of the organization.

Historically, the birth of departments developed from a need to improve the organization and management of the academic process as knowledge accelerated at a fast pace. The influence of German universities and the search for scientific truth were significant influences in the development of disciplinary specialization (Hecht et. al.,1999). Especially at the graduate level, this kind of organization became inevitable (Kerr, Gade & Kawaoka, 1994). Some university managers, however, described academic departments as ‘stovepipes’ and criticized them for being too specialized to adjust to new research policy settings (Brint, 2005). These critics have also stressed that departmentalization of disciplines was instrumental in moving the goals of colleges and universities from a teaching mission to publishing, research, and seeking tenure concerns. Ultimately, Hecht states that commitment to the discipline has become more important than loyalty to and concern for the university (Hecht et. al., 1999).

One way of thinking about these specialization effects is in terms of paradigms. Kuhn, in his work on knowledge paradigms, indicated that in universities, the discipline basically prepares students for a particular scientific community that they will be involved in even after graduating. The knowledge paradigm ultimately influences the culture, organization, language, thinking and problem solving within a discipline (Kuhn, 1970). Disciplinary specialization is an important basis for values in the department. Through contributions to disciplinary knowledge, departments gain reputations,

maintain rankings, attract faculty and graduate students; thus, enhancing the power of the department both outside and inside the institution (Braxton & Hargens, 1996;Webster & Skinner, 1996). Here, the discipline can be seen as a system of control of behaviors, ideas, actions within a department (Siskin, 1994).

An academic discipline calls for a body of knowledge, a constant supply of important and complex problems to solve, and research to solve these problems. The responsibility of performing this research is a major part of the scholar's job and includes an on-the-job practice for the PhD candidate in the discipline. The other main part of the academician's job is to teach the body of knowledge, both what is established and what is being discovered by the research (Berry, 1992).

Departmental Values

Academic departments are evolving organisms and values may differ in the culture of the department. However, there is consensus in the literature that there are core values that seem to be important in university departments (Kuh & Whitt, 1988; Luscio, 1987; Walvoord et al, 1999). These are:

1- *Collegiality. The?* collegial model is explained as a close group of peers under a consultative leader making decisions and share work in collaborative ways. Connectedness and community in the department are valued.

2- *Autonomy.* Academic freedom and autonomy are among the most valued characteristics of a department. Autonomy is found to be one of the main sources of job satisfaction among faculty.

3- *Academic freedom.* Academic freedom is defined as the right of the academics to put across intellectual judgments within their expertise. Faculty places a high value in freedom of choice and pedagogy as well as research.

4- *Specialization/expertise.* Departments gain integrity and influence on the basis of their specialized expertise. Expertise then becomes a basis for hiring, status, reputation and pay.

There may be other values that emerge according to the discipline, service and mentoring orientation, the university structure, the departmental standing and the socio cultural make-up of departments (Walvoord, 2000).

Departmental Work and Faculty Roles

Departments face multiple influences in defining work. Because departments are situated within larger institutions, there are both disciplinary and external forces in terms of policies and administrative responsibilities that they have to consider (Walvoord et al, 2000). For example, department leaders are liaisons between the larger institutional leadership and the department's own interests (Hecht et al, 1999). The department then becomes the expression of the academy's focus on knowledge. Multiple influences define departmental work. The influence of the discipline and the influence of the organization remain powerful sources that determine action in departments.

Departmental Models:

The organization of the departments, interaction of members as well as the environment in which the departmental work takes place are important aspects in the organization of departments. These aspects are included in the multiple frames to view departments (Walvoord, et al., 2000).

The collegial model. Based on interviews with 360 faculty in 15 different institutions (Massy, Wilger and Colbeck, 1994), collegiate departments emphasize consensus, shared power, collective responsibility and de-emphasize status differences. The study found very few "authentically collegiate" departments in the study.

The oligarchic, feudal and caste-based model. Oligarchic model denotes where a few rules many such as senior faculty having considerable authority over the junior ones where assistant professors are worried about reaching tenure; or deans and chairs exert power through incentives (Walvoord et al., 2000, Hecht et al., 1999). The terms feudal or caste-based system is used by Crothers (1991) to describe departments. He includes department members (roles?) such as faculty, support staff, research staff, graduate students and undergraduate students each forming a unit that exercises different kinds of power.

Mixed Models. Departments are in reality mixed models. Groups may need different forms of structure for different responsibilities. For example, curricular decisions may be made in a collegiate model and tenure

decisions may take an oligarchic model (Bolman and Deal, 1991; Walvoord et al., 2000).

The Department Chair

Academic management is not a very clear practice, it is exceedingly reliant upon the organization of authority and power, and it is influenced by the beliefs and values of the academic culture (Bensimon, Ward, & Sanders, 2000). Department chairs have multiple roles and responsibilities and they serve more than one community. They are responsible for the academic developments in their departments and also for carrying out the campus policies for central administration (Hecht et al., 1999). Department chairs, unlike any other administrators including deans or presidents, have a very intimate relationship with department members. They teach alongside their colleagues, are responsible for graduate student advising and experience and participate in the same cultural atmosphere as well as solve internal and external problems (Hecht et al., 1999). Department chairs also have a responsibility for supporting the institution by representing institutional policies and state initiatives accurately (Walvoord et al., 2000; Hecht et al., 1999;

Computer Science Discipline

Computer science is the study of the theory of computations and their implementation and application in computer systems. Computer Science is usually portrayed as the theory, analysis, design, implementation, and application of algorithmic processes that describe and transform information. The technological transformations of recent years such as the internet and communication technology have transformed

computers from being the subject of study to being tools (Denning, 1999). Accordingly, the discipline of Computer Science in other languages has a more comprehensive name such as Informatica in Spain or Datalogy in Denmark to include the widespread applications of data (Rojas, 2001).

Some consider computer science to be an applied form of mathematics and others a branch of engineering (Rojas, 2001). The progression of computer science as a discipline involves several stages. In the first stage, computer science was considered a part of mathematics; as technology progressed with the use of the design elements of software and hardware, it became a part of engineering. Recent developments in communications, artificial intelligence and universal expansion and availability of use of computers created the Human Computer Interaction (HCI) phase which adds human behavioral elements such as communication, linguistic, cultural, social and psychological features to the technical aspects of using and designing systems (Eden, 2007; Wickens, Lee, Liu, Becker, 2004). HCI describes the psychology of how people use computers. For example just like fitting jobs to workers, it fits people to machines. It involves user analysis, task analysis and an analysis of environment (Rojas, 2001). That is why in some research universities computer science is a department in the school of mathematics, in others it is a part of the engineering, while other computer science departments are a division of their own (Eden, 2007).

In fact, computer science has four conceptual areas highlighting this progression. The theoretical side of computer science deals with computability theory and traditional math topics. The technical side is related to the construction of computer

networks and the infrastructure in general. The practical side is the practical approach to solution of computational problems such as software engineering, artificial intelligence and robotics. Finally, the applied side came out as a collaborative effort to make computer use applicable in other disciplines such as geographical information science, medical or business science (Edens, 2007).

History of Computer Science

The earliest known tool to perform computations was the abacus invented in Babylon in 2400 BC. The differential gear used in a chariot, invented around the same time in China, was later used in analog computers. In 400 BC ancient Indian mathematicians invented logarithms. Then, an 8th Century Arab mathematician, Muhammad Ibn Musa al-Khwarizmi, introduced the use of algorithms with the elementary equation solving methods that is known as algebra. Algorithms are a well defined set of elementary steps that have to be followed to solve a problem such as methods used in multiplying two decimal numbers. Computer algorithms solve large, complex and repetitive problems. In the 13th Century, Muslim mathematicians started using algorithms in a sophisticated way and the information found its way to Europe through scholars and publications (Rojas, 2001; Hassan, 2005).

In late1600s, German philosopher Gottfried Leibniz studied the properties of a binary system. Around the same time he found out through letter exchanges with a missionary in China the Chinese I Ching hexagrams which had the same philosophy such as the Buddhist doctrine of how Ying and Yang operated with the two binary principles. It took another century for British George Boole to incorporate this idea into

algebraic forms. A French straw hat maker Joseph Marie Jacquard in 1800s used the idea of binary logic to invent punch cards to make machines driven by binary systems (Rojas, 2001)

The term computer referred to people doing computations in 1920s. In 1940s, the term gradually gave way to refer to the electronic digital machinery used to perform calculations that were previously done by people. The emergence of the discipline of computer science started in the 1930s with British mathematician Alan Turing and American mathematician Alonzo Church when they introduced a sophisticated use of algorithms for computations. The Church-Turing thesis introduced a hypothesis about the nature of mechanical calculation devices, such as electronic computers claiming that any calculation that is possible can be performed by an algorithm running on a computer (Koetsier, 2001; Rojas, 2001).

The term computer science was coined by George Forsythe from Stanford University in the 1960s. The first computer science department was established in 1962 at Purdue University

The number of PhDs granted in Computer Science in the United States increased by more than ten thousand between 1995 and 2000. More than 1500 PhDs in Computer Science are granted every year the United States and this number is increasing every year (NSF, 2007). Even so, US departments of Computer Science are not able to provide all the specialists required by US industry and many have to be recruited from abroad (Rojas, 2001)

In conclusion, it is evident from the progress of the field from early centuries to today that the field of computer science is truly universal. Especially in the contemporary sense of its applications, computer science is a field that adapts technology to people worldwide.

International Graduate Student Flow

There is an increase in international competition to recruit the best students especially in Science and Engineering (S & E) fields (Koh-Chin, 2006; Griffiths et al, 2005). Universities in the Unites States have experienced a 25% increase in international doctorate students in S&E fields between 2001 and 2005 (IIE, 2006) and this increase accounted for nearly all of the overall growth in S&E during the period (Hill, 2006). International students on student visas earn a larger percentage of their degrees at the doctoral level than at any other level. Some fields have a higher proportion. For example, in 2005, international students on student visas earned half or more of doctoral degrees awarded in engineering, mathematics, computer sciences, physics, and economics (IIE, 2006).

The international scientists and engineers that come to the U.S. for doctoral training are typically among the best of their peers in their countries. Often they have to pass through several screenings both in their countries and in the U.S. including being educated in the best schools in their countries, passing both U.S. and foreign professional and licensing requirements, professional background and other criteria for competing for the limited number of openings available (Stephan & Levin, 2006). Several studies have concluded that the U.S. has benefited from the high flow of

international talent (Stephan & Levin, 2006; Griffiths et al, 2005; Chellaraj, Maskus & Mattoo, 2005). This contribution is documented in terms of university rankings, patent applications, awards and publications (Arber, 1999; Griffiths et al, 2005; Stephan & Levin, 2006; Chellaraj et al, 2005). For example, Chellaraj, Maskus and Mattoo (year?) investigated the contributions of foreign graduate students and skilled immigrants to patenting activity, finding powerful and positive effects (2005). In addition, by selecting from a worldwide pool of top applicants, universities can keep their entrance requirements at a high level, adding to the high ranking prestige of the university (Marginson & van der Wende, 2007). The high level of publication productivity also has a high correspondence with this prestige or reputational rankings of the authors' graduate schools attended (McCormick & Rice, 2001). Griffiths et. al. (2005) reports that the most elite institutions in the U.S. experienced the largest increases in international graduate student enrollments.

Push-Pull Factors

There are several "push" and "pull" factors in the decision for international graduate students to choose the best places to study (Mazzarol & Soutar, 2001). The "push" factors have to do with the economic, social and political forces within the country of origin. Several reports have suggested that economics is a powerful factor in international education. Many international graduate students that study in the U.S. have limited or low paying job prospects in their home countries (Marginson, 2006; Mazzarol, 2001; Yang, 2007). In addition, the inadequate availability of graduate education in some countries, countries such as Turkey and China, is also a strong push

factor (Cakmak, 2003; Yang, 2007). Some social and political forces such as discriminatory processes for ethnic minorities, political unrest, and unsafe study environments also push students to seek studies in different countries (Altbach, 2004).

The "pull" factors are related to the characteristics of the host country that the student selects as a final study destination; these pull factors mirror push factors to a certain extent and include quality of education, job opportunities, convenience and perception of being a welcoming place (Mazzarol, 2001; Griffiths et. al. 2005). One pull factor favoring moving to the U.S. is financial support. More than 75% of foreign doctoral recipients in the U.S. reported that their universities were the primary source of support for their graduate education (Marginson, 2006; Guellec & Cervantes, 2002; IIE, 2006). Another pull factor is the availability and high compensation for academic jobs in the U.S. beyond their education.

Competition

The increase in the worldwide demand for international education has intensified competition among host countries (Labi, 2006; Marginson, 2007). More than half of international students choose their overseas study from five major host countries (OECD, 2004). The United Sates is the leading country and has around 22% of total international students; the United Kingdom has 11%, Germany has 10%, France has 9% and Australia has 7% (Atlas of Student Mobility, 2004; OECD, 2006). However, the intense competition to recruit international students is changing these percentages and countries other than United States are getting to be key destinations for these students (Altbach, 2004).

Contributions

International students contribute to the country's economy in many ways. In 2006 IIE reported that the total contribution of international students to the U.S. calculated as the sum of tuition, fees, living expenses and dependents minus the U.S. institutional and federal support amounted for more than $13 billion (IIE, 2006). Tuition and living expenses are not the only economic benefit gained from international students. These students have also proved to have generated economic gains by contributing to the host (?) country's global competitiveness by increasing the numbers of highly trained people in key disciplines (Altbach, 2004; Marginson, 2006). A 2005 report of the National Academy of Sciences (NAS) notes that: "The participation of international graduate students and postdoctoral scholars is an important part of the research enterprise of the United States… If their presence were substantially diminished, important research and teaching activities in academe, industry, and federal laboratories would be curtailed" (Griffiths et al, 2005, pp. 65).

It is important to note that international students have a high inclination to stay in the U.S. after completing their studies (Chellaraj et al, 2005; Matthews, 2007). In 2000, foreign-born doctorate holders were 37.3 percent of the U.S. S&E labor force. In 2001, 57 percent of those had become U.S. citizens (Griffiths, 2005). Aslanbeigui and Montecinos (1998) also noted that 45 percent of international students from developing countries planned to work in the U.S. market for a while and 15 percent planned to stay permanently. National Venture Capital Association released a study in 2006 that concluded that foreign born entrepreneurs had a role in starting 1 in 5 venture-backed

public companies in the United States during the past 15 years. These companies which include Yahoo Inc., eBay Inc., Google Inc. and Intel Corp. have created thousands of jobs and have a combined market capitalization of $500 billion, the study found (Anderson & Platzer, 2006). Most of these foreign-born individuals entered the country as children, teenagers or graduate students.

Stephan and Levin in their 2006 study used six indicators for the contribution of foreign-born scientists and engineers in the United States. Although the data did not include which percentage came to the U.S. as graduate students, it was indicated that of the 29,859 foreign-born scientists with PhDs studied, only 10% held foreign PhDs. The contributing factors include "individuals elected to the National Academy of Sciences or Engineering (NAS/NAE), authors of citation classics, authors of hot papers, 250 most-cited authors, authors of highly cited patents and scientists who have played a key role in launching technology firms" (Stephan & Levin, 2006, p. 5). The authors concluded that in all the areas mentioned, foreign born scientists and engineers made disproportionately high contributions compared to their native colleagues (Stephan & Levin, 2006).

In addition to all the benefits for the United States, there are some global effects of hosting international students for high level graduate work in S&E (Regets, 2007). According to The National Science Board (NSB) (2008b), in recent times, the amount of R&D carried out by universities and colleges has grown faster than any other segment of the U.S. economy. One benefit of increased R&D activities by internationals

is collaboration between countries. This in turn decreases duplication and results in increased efficiency in R & D spending globally (NSB, 2008b; Regets, 2007).

Another global effect is the formation of international research and technology partnerships (Regets, 2007). The National Science Board (NSB) recently issued a report, "International Science and Engineering Partnerships: A Priority for U.S. Foreign Policy and our Nation's Innovation Agenda," in which the importance of developing federally supported international science and engineering activities is discussed (NSB, 2008c). The board reported that these partnerships provide "the necessary environment for future generations of scientists and engineers to tackle global problems" (NSB, 2008c, p. 7).

Negative Effects

There have been several arguments about the effects of having an increased presence of international graduate students in the U.S. Apart from the positive implications mentioned, there have been some negative effects raised by the critics of international graduate education.

At the top of this list is the displacement effect of foreign nationals in the S&E graduate fields. Borjas (2004) found a strong negative correlation between the enrollment of native men in U.S. graduate programs and international student enrollments. He also added that the institutions that had the largest increase of international students experienced the sharpest fall in the enrollment of native males. These effects in the study were not significant for women or members of minority groups within the U.S. However, the high numbers of international students in graduate

programs produced many critical responses mainly from the minority community (Matthews, 2007). Historically underrepresented minorities in S&E fields such as African Americans, Hispanics and Native Americans argue that inequality exists in the university science community with respect to international student enrollments (Ibram, 2006; House Subcommittee on Immigration and Claims, 1999). The claim is that the increasing number of international graduate students in S&E displace minority students (Matthews, 2007). Division of Science Resources Statistics of National Science Foundation (NSF) conducted a survey to examine the displacement effect of international students and observed that an increase in enrollment of one group was (?) associated with the increase in the enrollment for all groups which was inconsistent with displacement (Regets, 2007). Chellaraj et al in their study found that the increasing numbers of international students took the new openings of expanding PhD programs in S&E, thus the authors concluded that international students were not substituted for domestic students. There is also the argument of native students being pulled and not pushed from the PhD programs in S&E; that is, highly valued industry jobs are being taken by native scientists and engineers who do not pursue PhDs and international students tend to stay in the academe which is less valued economically (Griffiths et al, 2005).

Other negative effects include the cultural and language barriers of international graduate students who also work as teaching assistants in universities (Matthews, 2007; Regets, 2007). Many graduate schools have new requirements for demonstrated proficiency in English, but problems remain (Gravois, 2005). Many international

graduate students argue the problem may not be entirely linguistic but cultural as well (Gravois, 2005). Although this criticism is difficult to evaluate, there are reports indicating that problems between native students and international teaching assistants negatively (?) affects the learning process (Matthews, 2007; Borjas, 2000).

Some critics have also raised concerns about transfer of knowledge to potentially hostile countries or terrorist organizations (Regets, 2007). The possibility of the global flow of knowledge and people conflicting with the national interests of a nation has long been a concern for the nation-state. Especially after September 11, this concern has been given substantial attention and has put international students, especially in technical fields, under the spotlight (Griffiths et al, 2005). This followed several changes in federal visa and immigration policies that were intended to place restrictions on an extremely small population, but have indirectly (?) affected large numbers of international graduate students (Griffiths et al, 2005; Regets, 2007).

Where are They From?

The top places of origin for international students remain heavily from Asian countries. Currently, China is the largest exporter of international students and it provides 15.2% of all international students in the world (IDP, 2007; OECD, 2006). According to the Institute of International Education's Open Doors report (2008), in the 2006/07 school year, of the 582 thousand international students studying in U.S. higher education institutions, about 84 thousand came from India following by about 68 thousand from China and 62 thousand from South Korea constituting the top 3 places of origin (table 1). The highest percentage of increase from 05/06 to 06/07 observed is

students from Saudi Arabia (128.7%), Vietnam (31.3) and Nepal (27.9). In the meantime, countries like Japan, Kenya and Indonesia sent fewer number of students in 06/07 than 05/06.

According to the National Science Board (2008a) the top 10 countries S&E doctorate recipients together accounted for 65% of all international doctorate earners in S&E fields in the U.S. from 1985 to 2005. Consistent with the overall international students, all but 2 of those top 10 countries are in Asia (table 2). There was an increase in the number of international students from Asian countries that earned doctorates in S&E from mid 1980s to mid 1990s followed by a short decline and, in turn, an increase in recent years. From 1985 to 2005, students from China, Taiwan, India, and South Korea earned more than half of the overall doctorates awarded to international students (NSB, 2008a).

The students from Europe have also increased in numbers in the last two decades with variations in the countries they are from. There has been a higher rate of increase in Central and Eastern Europeans earning U.S. doctorates in S&E compared to the Western Europeans. The rate of increase for Canada and Mexico were small compared to the ones from Asia and Europe (NSB, 2008a).

The stay rates of international students that earn U.S. doctorates varies by country of origin, but are increasing in general in S&E fields (Finn, 2007). These scientists and engineers play an important role in the innovation of science and their contribution to the economy, with over 6,000 graduating, staying and paying taxes annually (Finn, 2007). The highest stay rates for these students are consistent with the

number of doctorates earned for international students, China (2071 students 92% stay rate) and India (756 students 85% stay rate). Iran also has a high stay rate. The lowest stay rates are (less than 40%) from the following countries: Saudi Arabia (4%), Brazil (30%), Mexico (31%), Israel (33%), Indonesia (36%) and Japan (39%) (Finn, 2007).

Policy Implications of International Students

There have been significant shifts in the trends in international student enrollments in the United States especially over the last 10 years. From 1997 to 2002 there was a steady growth in international student enrollments in U.S. higher education institutions. Starting from 2002 until 2006 the U.S. experienced a decline in international students. In 2006/2007 academic year, the U.S. experienced its first increase since 2002 in international students by 3% overall (IIE, 2007). While the trend seems to be on the positive side, there are still issues to be considered. According to NSF, regardless of the recent increases, in 2006, the international students in the S&E fields have enrollments below the levels earlier in the decade. International students make up 29 percent of all S&E graduate students which are down from 31 percent in 2003 (NSB, 2008b, IIE, 2006).

Among the top countries that host international students, the United States had the lowest growth in international student enrollment from 1999–05. While international student enrollment increased by almost 17 percent in the United States in that period, it increased by 29 percent in the United Kingdom, 46 percent in Germany, 81 percent in France, 42 percent in Australia, and 108 percent in Japan (Bain, Luu & Green, 2006).

Although the United States has the largest number of international students in the world, it is one of the countries with the lowest percentages (3%). International students make up a higher percentage of enrollment in higher education in the United Kingdom (16%) as well as in Germany, France, and Canada (11% each) (OECD, 2006).

There seems to be certain policy issues that are related to the trends of international students in the United States. One issue is the global competition for the most talented graduate students (Mooney & Shailaja, 2004; Marginson, 2007). Many countries have developed recruitment plans at the national level such as U.K., Australia and some European countries (Koh-Chin, 2006). These countries have implemented several strategies to recruit international students, including using national marketing strategies, aligning immigration policies with recruiting goals, offering more programs in English, and creating regional educational goals (Bain, Luu & Green, 2006).The U.S. on the other hand has made it more difficult for international students to enter, study and work in the country (NAFSA, 2006; Griffiths et al, 2005). Following the September 11 terrorist attack, there have been several changes in the visa policies, such as extended time periods for visa clearance, intended to restrict the illegal movements of a very small population; however the effects were felt on the large numbers of international students (Griffiths et al, 2005).

The shifts in international student enrollment trends are not solely the result of September 11 and the immigration restrictions following that event. Some other factors including economic events such as Asian financial crisis or currency devaluation in developing countries (Mexico, Brazil and Argentina) influenced the decrease in

international student enrollments. These shifts have made countries that support students to study abroad for less expensive options (Birchard, 2005; OECD, 2004). Another explanation is, as mentioned above, the increasing competition from other countries such as Australia, New Zealand, and Canada. These countries and their governments have made conscious efforts to increase intenational student enrollments by offering employment and immigration incentives (Australian Education International, 2007; New Zealand Ministry of Education, 2007; Association Universities and Colleges of Canada, 2007). In addition, in Europe, the "Erasmus Project" aims to promote and support academic mobility of higher education students within the European Union, and the recent Bologna treaty which makes higher education compatible with selected European countries. The result has been higher movement of students within Europe (European Commission, 2008). According to the Chronicle of Higher Education, 82 percent of about 900 European universities had implemented Bologna compliant degrees (Labi, 2007). Some other countries with higher education systems modeled after the American system of higher education have also been urged to comply with European standards notably, Turkey (Cakmak, 2003; European University Association, 2003).

Student visa restrictions into the U.S. as mentioned earlier influence the shifts in student mobility trends (Pinsker, 2003). The key problem with the new policy is the amount of time it takes for an international student to obtain a visa, and the process seems especially difficult for international students studying S&E. (American Association for the Advancement of Science, 2003). Recent improvements in the visa

processing procedures are helpful, but the system is still far from efficient (Griffiths et al, 2005). There are some restrictions placed on international students studying in graduate programs in U.S. institutions. The student visa (F1) restricts students from being employed outside of their institutions that they are enrolled as students. However, they are able to work as research assistants or teaching assistants on federally funded research projects even though they are ineligible for direct federal aid (Matthews, 2007). Following their graduation, in order to be employed in the United States, individuals must seek employment from companies or institutions that will apply for them to get H1B temporary worker visa. This visa allows them to work in specialty occupations such as scientists, engineers, teachers and programmers. In order to obtain this visa, the employer must apply on behalf of the individuals, first proving that a native worker cannot be found to fill the position, and pay $1500 in fees for the application. This visa is valid up to six years with a similar evaluation after three years. The legislation – American Competitiveness in the Twenty-First Century Act of 2000 raised the annual number of H1B visas to 195,000 and reduced to 65,000 in 2004. United States Citizenship and Immigration Services (USCIS) formerly known as Immigration and Naturalization Services (INS), implemented in 2004 a 20 thousand extension to the 65 thousand cap for H1B visas for workers with advanced degrees. The opposition for such amendments is based on the charges that hiring H1B workers undermines U.S. citizen workers (Matthews, 2007). For example, Miano argues that international professionals on H1B visas work for lower salaries than their U.S. citizen counterparts and that weakens the negotiation power of U.S. workers (2007). An

amendment presented to Congress easing restrictions on international students in scientific and technical disciplines and increasing the potential ceiling for highly educated workers on H1B visas by 20% (.Amdt. 1150 to S. 1348) did not pass (Wasem, 2007). Another bill (S. 2715) was introduced to Congress to improve access to graduate schools in the United States for international students and scholars. This bill would specifically call for streamlining timeliness in the review of visa applications, the interoperability of relevant federal systems and databases, and reform of the SEVIS (Student and Exchange Visitor Information System) process. In reference to students studying S&E fields, the bill states that the Secretary of State, after consultation with the representatives of the U.S. scientific community, "shall issue appropriate guidance to consular officers in order to refine controls on the entry of visitors who propose to engage in study or research in advanced science or technology in order to ensure that only cases of concern, and not nonsensitive cases, are subjected to special review" (p.?????). This bill also did not pass (GovTrack.us, 2004).

Another aspect of shifts in the flow of international student flow shifts is the perception of international students that they are unwelcome in the United States (Griffiths et al, 2005). Students from countries with a large Muslim population report being badly treated by U.S. officials in their countries (Altbach, 2004). Some policies also contribute to this sentiment with large paperwork hurdles and long waiting periods (Griffiths et al, 2005). These stories and false rumors concerning can be damaging even if they are not real, as there is some evidence to suggest that that dissuade students from even attempting to secure places in US institutions (Altbach, 2004). Recent surveys

show that people not only from predominantly Muslim countries but from Europe and Asia also have a negative attitude towards the U.S. in general (Kohut & Stokes, 2006).

Legitimacy

Legitimacy can take many forms in organizations. Legitimacy is assumed to be an entity's actions defined as desirable or appropriate within a socially constructed system of 'norms, values, beliefs and definitions' (Suchman, 1995). As early as the 1940s, legitimacy was recognized as a central element in political and governance structures, managing the relationship between the acceptance of societal establishments and institutions and their capability of exercising power and authority in an effective way (Weber, 1947). The theoretical framework used in this research study deals with legitimacy in the realm of higher education.

The concept of what is proper and desirable for institutions, drawn from neo institutional theory provides a powerful way of conceptualizing how beliefs and values are situated in the global environment and enacted locally within the organization to attain legitimacy (Gumport, 2002). It is not possible to explain the significance of legitimacy for institutions without summarizing the foundations of such conceptualization within institutional theory. The rationale for institutional theory is an open system perspective, such that organizations are effected by their environments. The forces that guide institutions are not only competitive and efficiency-based, but also socially constructed belief systems. Values and rules exercise control over organizations influencing both their structural and performance elements (Scott, 2003). In explaining institutions, Selznick (1949) while acknowledging the rational view of attaining goals,

notes that the complex informal systems explain the non-rational dimensions of organizational behavior. He emphasizes that these non rational dimensions include the complex informal aspects that link individuals to each other and to external forces (Scott, 2003). Parsons worked on explaining institutionalism paving the way to new institutionalism. He argued that it is the organized system of rules and values that represent an institution, not the pattern or type of social relationships. In his work, Parsons did not however, account for how the differences in cultural beliefs give rise to different institutional structures (North, 1981)

Institutions are considered to be a web of interconnected rules and norms that reduce uncertainty in relationships. As Meyer and Rowan (1977) argue, formalized structures reflect the rationalized myths of the environment which in turn legitimate the organization. An organization becomes legitimate by designing a structure that includes the myths of the institutional environment. Here rationality is not the focal point but rationality that signals appropriateness, which, in turn, leads to perceptions of legitimacy. Meyer and Rowan also state that conformity to institutionalized rules does not necessarily enhance efficiency but may symbolize legitimacy (Rowan & Miskel, 1999). Di Maggio and Powell (1983) developed this idea further by suggesting that over time, organizations in the same institutional environment come to be similar to one another (isomorphism). There are basically three ways of explaining such similarity. Coercive isomorphism suggests that organizations adapt procedures based on rules and regulations and policies that are forced by a formal entity. Normative isomorphism refers to organizations adapting the structures because they are accepted norms of such

behavior in similar circumstances such as the shared knowledge base of a profession. Mimetic isomorphism is the copying or mimicking the behavior of other organizations under conditions of uncertainty. These isomorphic trends lead to the generalized assumptions of legitimacy of an organization as influenced by other organizations.

University Department as an Institution

Higher education has long been considered as an institution in terms of explaining its organizational elements. Generally, institutional views describe the dependence of the local organization on the broader environmental values, cultures, norms and models (Meyer, Ramirez, Frank & Schoefer, 2007). Higher education institutions heavily depend on the wider environment and other institutions such as government agencies, industrial companies, or international institutions such as UNESCO. Viewing higher education as an institution explains the connection of these organizations to broader national and global environments where the legitimacy of these institutions are explained more and more in terms of their international designation and world standards (Meyer et al, 2007; Marginson & Rhoades, 2002).

Although higher education institutions are governed with rules, norms and beliefs and exist in connection with the wider world as the definition of an institution suggests, the pluralistic nature of these organizations creates a problem in the identification of legitimacy in terms of multiple paradigm systems, conflicting demands of stakeholders and commitment consistency as Clark Kerr described the extensive character of higher education organizations when he stated that the American university is “so many different things to so many different people that it must, of necessity, be

partially at war with itself" (Kerr, 1963, p. 8). Here, Kerr suggests that a higher education organization is an element of multiple institutional systems where its rationale and functions reflect the inconsistencies within the organization as well as the system and its environment (Kraatz & Block, 2008). The pluralistic nature of these organizational systems gives way to various rules, norms, beliefs and values that operate within multiple institutional fields. Such an organization is subject to multiple regulatory establishments, set in multiple normative structures, and is a part of more than one institutionally recognized legitimate identity. This feature of the university complicates the notion of identifying legitimacy (Kraatz & Block, 2008). Brint in "The future of the city of intellect" mentions the university as becoming an enterprise that juggles social, economic and other expectations designed to serve multiple interests (2002). He stresses the complex nature of these expectations and indicates that it is difficult to establish a central theme in the competing narratives about this institution (Brint, 2002).

University departments as defined by Walvoord et al (2000) are also uniquely autonomous structures within a very complicated system that influence and are influenced by their environment. Each department has their own values, norms, tasks, networks, participants and income. They are influenced by the larger organization as well as national and international academic systems and rules (Hecht et al, 1999, Walvoord et al, 2000). However, the fundamental difference between a university and a department is that the academic discipline, more so than the type, size and/or mission of the institution essentially affects the department. The knowledge paradigm influences

the values, culture and rules throughout the department (Kuhn, 1970; Braxton & Hargens, 1996; Walvoord et al, 2000).

To answer the first question of why legitimacy is important in our discussion, we have to look into what happens when it disappears. Legitimacy is by definition something which people take for granted; when it exists, people hardly notice it; and when it is gone, the system collapses with such rapidity that there is no time to salvage it (Boulding, 2007). For example, no one prepared for the housing market collapse in 2008 because it was highly legitimized. The lobbyists urged banks to give loans to low income families, the banks saw this as an opportunity and a legitimate action that they gave interest only loans to people who cannot afford them, people started buying and as demand increased so did the prices, the people seeing the increase in prices thought they could just pay the interest for a few years and sell the house and even make money on something they can't afford, the prices started going down and suddenly the whole system collapsed losing legitimacy in all directions.

To answer the second question of to whom legitimacy is important, we should consider another main component of institutional theory that organizations become legitimate by taking on practices and acting in ways that are considered to be proper or appropriate by different groups of stakeholders (DiMaggio and Powell, 1983; Meyer and Rowan, 1977; Suchman, 1995). The notion of who decides whether an organization is legitimate and who is influenced by this decision is an important point in making sense of legitimacy issues. Because of the assertion that losing legitimacy negatively influences organizations (Boulding, 2007), anybody who considers the good of the

organization is influenced by its legitimacy. For example, the legitimacy of a small rural Turkish university's computer science department may not matter to a computer science faculty member at California University until a student from that small rural Turkish university applies for graduate studies or a joint research project is proposed. In this example, stakeholders and players of the organizations have to consider the legitimacy of their organizations in a larger context.

To consider the third question of organization-environment relationship, we can look to the notion of isomorphism leading to legitimacy (DiMaggio and Powell, 1983; Meyer and Rowan, 1977). In the neo institutional view, organizations are said to advance in a way that improves their legitimacy by adjusting to dominant models in their environments (Brint, Turk-Bicakci, Proctor & Murphy, 2009). Organizations complying with commonly used strategies, structures, and practices seem reasonable and sensible to the social system of which they are a part of and, therefore, are by and large considered acceptable (Deephouse & Carter, 2005). On the other hand, organizations that diverge from what is considered appropriate behavior break cultural or legal expectations. They may have challenges in legitimacy and may be considered unacceptable by stakeholders (DiMaggio and Powell, 1983; Meyer and Rowan, 1977).

The fourth question is the most difficult to answer. Because legitimacy depends on values, norms and beliefs, and because higher education institutions and their academic departments are pluralistic entities set in more than one identifiable society, it is hard to measure them as single units. There has been some empirical research to assess the legitimacy of various organizations. For example, Elsbach (1994) used a case

study analysis to identify a model for organizational legitimacy by describing verbal accounts of participants after a legitimacy threatening event to the California Cattle Industry. She collected data from cattle company representatives and categorized the accounts in terms of acknowledgments, denials, organizational characteristics (using neo institutional accounts) and technical characteristics of efficiency of performance. She then analyzed the data by linking accounts and concluded that "organizations may protect or even enhance their legitimacy following controversies that violate social norms if those controversies are followed by acknowledging accounts that refer to normative structures, procedures, or goals" (Elsbach, 1994, p. 36).

Another example of assessing legitimacy in organizations were done by Deephouse and Carter (2005) in a statistical analysis of commercial banks using measures of legitimacy as identified in neo institutional theory with variables of strategic isomorphism, age, size, return on assets and total assets. They tested four hypotheses one of which suggests isomorphism leads to legitimacy which was confirmed by the study. Moreover, Brint and Karabel (1991) in the light of neo institutional theory, in exploring American Community Colleges, demonstrated how the American Association of Junior Colleges supported the legitimacy of vocational colleges by developing legitimate recruiting, guidance, and placement programs to show how organizations strategically use links to institutionalized structures or procedures to demonstrate organization's acceptability (Brint and Karabel, 1991;Oliver, 1991:158).

These examples show that each author took the legitimacy issue in a different way by using different methodologies depending on what aspect of legitimacy and what type of organization they inquired. The common point in all of them was that they all used neo institutional theory as the lens to their individual studies.

Types of Legitimacy

Legitimacy can be considered in terms of internal legitimacy and external legitimacy. Internal legitimacy is the belief of an individual that the role which he plays is acceptable and justifiable to him/herself. This belief influences individual's actions and the perception of the organization of which he is a part of. It involves personal and cultural values and varies among individuals depending on their personal principles. It may lead to satisfaction or dissatisfaction, higher involvement or detachment, or a move towards change in the individual. External legitimacy on the other hand is the approval of other related entities in the environment including the larger organization, the community or the global society. The notions of internal and external legitimacy can be applied not only to people but to any subsystem of the society including organizations. The literature suggests three types of external legitimacy that influence organizations. These are normative, pragmatic and cognitive.

The normative legitimacy, also known as moral (Suchman, 1995) legitimacy exists in an organization that reflects socially accepted norms, standards and values. The organization is assessed in terms of its social desirability. Normative legitimacy has four variables: 1) judgments about outputs and consequences, 2) assessment of procedures and methods, 3) evaluation of categories and structures, and 4) evaluations of leaders

and personnel. The first variable of outputs and consequences can be understood in terms of measured outcomes. For example, student graduation rates, test scores, job placement for graduates, number of articles published in peer reviewed journals, or earned awards can be easily measured. The second variable, assessment of procedures and methods are usually performed according to set standards on mandated procedures. In many countries, the legitimacy is achieved through accreditation units, licenses or regulatory assessment of procedures. The third variable, the evaluation of categories and structures refer to the field specific norms and regulations. The validation of membership depends on universally accepted standards for a specific academic field. The fourth variable of evaluation of leaders and personnel is more widespread in countries that put more value in leadership than standards. For example in Africa the "big man" syndrome is defined as the organization's legitimacy depending on who leads it. Legitimacy in this view is not what or how things are being done, but as a function of perceived legitimacy of the representative in the organization (Brinkerhoff, 2005; Deephouse & Carter, 2005).

The pragmatic legitimacy refers to the relationship of the stakeholders in an organization in which the value depends on how their interests are fulfilled. Here, the evaluation of legitimacy depends on the extent to which the organization can operate to serve the needs and interests of its stakeholders and constituents. University departments have multiple constituencies and stakeholders such as students, central administration, national and international organizations, grant funding parties (Brinkerhoff, 2005). These parties are usually not equally effective in determining the

legitimacy and may sometimes have differing values which complicates the overall legitimacy of the organization. They can, however, also challenge organizational legitimacy when they think that an organization's procedures or behavior are inappropriate or not aligned with their expectations (Elsbach, 2006). This dissatisfaction can result in public disapproval and demands for change, or the withdrawal of support for an organization. . In other words, an organization may be perceived as legitimate in some ways and not in others depending on the involvement of related parties (Carberry, 2006).

Cognitive legitimacy refers to an organization's purpose and procedures being accepted by the society in which the organization exists. If the society has a cultural frame that explains the behavior of the organization as having comprehensible and sensible results, then the organization is said to have cognitive legitimacy based on clarity (Brinkerhoff, 2005). For example, the idea of the banks giving credit for individuals to buy houses is a legitimate practice in United States. The same idea was brought wholesale to Turkish society and the society rejected it based on deep cultural and historical values. People did not engage in the behavior because the practice did not seem sensible with an ever volatile economy and the history of the enormous collapse of banks in late 1980s. In contrast, the diamond companies trying to have a market in Japan have introduced the practice of engagement rings to a society that did not have that practice as a part of the culture. The Japanese society very quickly took to the idea and the practice gained legitimacy. Another way of achieving cognitive legitimacy is to have the organization's legitimacy rooted in the social construction of reality where

legitimacy becomes a ‘way of life’. This is also referred as taken-for-grantedness that a society accepts organizations because they are already accepted as such throughout history. An example of this cognitive legitimacy can be seen in the belief in public universities (Walker & Walker, 2003; Brinkerhoff, 2005).

Globalization and Legitimacy

The environment in which organizations exist today are much broader than 20 years ago. As seen in the examples of a small rural Turkish University or a diamond company, global forces are undeniably a part of any organization in today’s society. This fact influences the perception and significance of legitimacy for the organization. In the example of the rural Turkish university, the change from local to global is almost immediate and organizations are more and more experiencing this phenomenon. This occurrence in the language of physics is called phase transition where it transitions from a disconnected state to a connected one. The point it happens is called critical point which denotes the onset of phase transition in a large interconnected network which in this case is the world of higher education, or the world of computer science (Watts, 2004). The notion that networks create their distinct social systems is one of the consequences of globalization. A society or culture is no longer place specific and the rules, norms and values of each society connected with networks have their own constituents to identify legitimacy. This indeed is a very complicated system. Legitimacy in the global sense cannot be examined only in terms of their specific network societies, but also through the interactions they create through other related societies.

How the Legitimacy Theory Helps Answer the Research Question

The question of how globalization is perceived by the computer science department and whether the decisions made in recruiting students is a part of internationalization is closely related to the neo institutional way of looking at legitimacy. In neo institutional theory the organization is affected by its environment and its legitimacy is determined by the perception of its related entities. While determining the cause of the decisions and how globalization influences these decisions, it is important to look at what the players think is legitimate and how this thinking is (used to inform?) their actions. In other words, the concept of legitimacy will provide a lens into their specific perceptions of globalization.

Decisions made in a university department may be influenced by the network societies mentioned earlier, and the legitimacy of the decision may depend on which society is more valued by the department. By listening to accounts from each perspective that make up of the department, we can try to understand the networks influencing the decisions made.

Chapter 3

Methodological Framework

Qualitative Study

Qualitative, interpretivist, theory of gaining knowledge constitutes the methodological framework for this project. In other words, the knowledge can be constructed by looking at approximations, multiple perspectives, dynamics and deconstruction of structures and discourse analysis (Capper, 1993).

The main philosophical assumption of qualitative research lies in the view that reality is constructed as a result of an interaction of individuals with their social surroundings (Merriam, 1998). Qualitative researchers are mostly interested in the meanings constructed by their informants, that is how they make sense of the experiences in their world (Sherman & Webb, 1988). In this project, I am interested in understanding the participants' perspectives of the phenomenon of globalization. Another characteristic of qualitative research is that the data is mediated through the researcher as a human instrument. As compared to other data collection instruments, the researcher is receptive to the context and can adapt techniques to the environment. For example, non verbal cues can be used to interpret data as well as direct responses (Merriam, 1998).

A third characteristic of qualitative research is that it generally is done through fieldwork. The researcher is physically present in the surrounding of the study to observe behavior in the natural setting (Merriam, 1998). In this project, I was personally

present in the institution to collect data in order to be intimately familiar with the surroundings.

A fourth aspect of qualitative research is that the strategy is mainly inductive. This means that the research builds theories or hypotheses rather than testing them (Merriam, 1998). Qualitative researchers often try to find ‘a theory to explain their data not the other way around (Goetz & LeCompte, 1984, p. 4). The findings of qualitative studies can be in the forms of conceptual findings, hypotheses, typologies, classifications obtained from the data (Merriam, 1998). In this project, also, there is not an identified hypothesis that is being tested. The data are from the researcher’s experience.

Lastly, qualitative research is comprised of a rich description of a process to be studied. In order to achieve the objective of in-depth description and understanding, qualitative research utilizes a variety of methods and data collection strategies. Participant observation, interviews and collection of documents are strategies used in collecting data in this study. Data in the form of citations, pictures, descriptions and documents may be included to support the findings of the study (Merriam, 1998).

Qualitative interpretive research seeks answers to questions regarding how social experience is created and given meaning in a cultural context. Here, culture is not a static entity to be measured but a fluid one as we see in Erickson’s words “Through culture humans share learned systems for defining meaning, and in given situations of practical action humans often seem to have created similar meaning interpretations. But…in a given situation of action one cannot assume that the behaviors of two

individuals…have the same meaning to the two individuals" (p. 126). Here, we can see the value of qualitative interpretive research as it recognizes the subtle variations in humans and interprets meanings accordingly.

Research Design

The primary purpose of the research is to bring a deeper understanding of the perceptions, dynamics and the culture of a computer science department in the context of the global environment. Therefore, the locus of the study was the computer science department of California University (CU [pseudonym]). Instead of the real names, pseudonyms are used to protect the privacy of the institution and the informants.

Rationale for Selecting the Site

There are basically two reasons for the selection of the site. The first is epistemological. This site provides the central component of my research, namely a department of a university that offers graduate level training in the computer science field with a high level of international students. My main interest lies with the phenomenon of globalization particularly in graduate education in science and engineering. I was searching for such a department that displays visible features of globalization. In higher education, one of the main components of globalization is the international student mobility and flow in terms of students getting educated away from their native countries. This was a starting point for me. There are 120 graduate students seeking PhDs in the department and 85 of them are international students.

The second reason for choosing the site is practical. I already had established rapport with some of the professors and students through social contacts. In fact, one

associate professor in the department is the husband of a very close friend, and during the course of the fieldwork, I resided with them. I do not have familiarity with the department or the particular study area (computer science) apart from this research; however, I have met several of the members outside the academic setting. For this reason, I had a feeling access would not be a huge problem if I decided on this site. I also was aware of the high number of international students in the department not only from school demographic information but because I had attended some social functions the professors put together for their students in this particular department many years before and noticed them. When I inquired about conducting research in this department, the responses I had were very positive and I went ahead with the study without running into major obstacles in accessing most of the participants.

Sample

Initially a convenience sampling method was used using the two informants I personally know from the department. I explained my purpose and my desire to get a heterogeneous (I'd probably used the term heterogeneous, as your sample was not designed to be statistically representative) sample that would be willing to participate for the study. My informant sent an e-mail to all the professors in the department informing them of my contacting them for this study. Then, I sent an e-mail invitation to the faculty members asking them to participate. I interviewed the ones that agreed to be interviewed (14 of them). Although he sent the e-mail to the entire faculty, he also recommended a few of them that he thought would be particularly useful to interview. My participants included three of the five professors he particularly recommended.

Similarly, a Turkish student whom I personally know also helped with identifying a representative sample that she thought would be useful for my study and sent those e-mails to participate. I then sent an e-mail to 86 PhD students in the department including the ones she recommended. 14 of the students agreed to be interviewed including both native and international students, from various stages of their program. Some students were friends and others didn't quite know each other. The sampling was a combination of convenience and snowball sampling because I got leads from initial participants about prospective ones.

I collected data from:

a) *The department chair.* Interviewing the department chair gave me the unique opportunity to look into the dynamics of his role as well as providing a first hand account of how things work in that particular department.

   Dr. Phutan. The Computer Science Department Chair.

   Nationality: Indian born American, came to U.S. as a PhD student. In this University for 9 years, 2 years as a chair, taught a university in Canada and Texas for 11 years total before that.

b) Professors *with administrative duties.* All professors in this department have administrative duties. Multiple roles give faculty a high responsibility and their views add to the cultural setting of the department. Especially in the student selection process, the faculty

involved in the graduate student selection committee provided insight into the policies and practices regarding this process.

Dr. Chang. Professor. Chair of Graduate Admissions Committee. Nationality: Chinese born American, came to the U.S. as a graduate student. 10 years teaching in this university, taught for 14 years in a university in Canada before coming here.

Dr. Calsoyas. Professor. Member of Graduate Admissions Committee. Nationality: Greek born American, came to the U.S. as a graduate student, teaching in this university for 15 years.

c) Assistant, *associate and cooperating faculty.* Faculty in various academic rankings have responsibilities that differ in some ways. For example new professors might have a larger teaching load than senior ones or might not be eligible for sabbaticals. These elements might give important insights in terms of creating the departmental environment.

Dr. Lane. Professor. Previously chaired department for 10 years. Nationality: American born and raised. Never lived in another country. Teaching in this university since 1981 and contributed to the establishment of the department.

Dr. Tasos. Professor.

Nationality: Greek, holds permanent residency (green card). Teaching at this university for 10 years. He is my friend.

Dr. Shelly. Associate Professor

Nationality: American born and raised. Lived in Geneva, Switzerland for two years during high school.

Dr. McLean. Professor

Nationality: Irish born American. Won visa through lottery when 19. Studied in the U.S. Teaching at this university for 8 years.

Dr. Mohi. Professor

Nationality: American born and raised. Teaching in CU for 15 years.

Dr. Ionescu. Assistant Professor.

Nationality: Romanian born, holds a visa to work in the U.S. (H1) Came to the U.S. as a graduate student. Teaching at CU for 1.5 years.

Mr. Smith. Lecturer

Nationality: American born and raised. He lived in England for 5 years in elementary school. Currently a lecturer and a PhD student.

Dr. Perinsky. Professor

Nationality: Polish born American. He came to the U.S. as an assistant professor in a university in New York. Teaching at CU for more than 15 years.

Dr. Mark. Professor.

Nationality: Canadian born American. Came to the U.S. as a graduate student. Teaching at CU for more than 15 years.

Dr. Strong. Associate Professor.

Nationality: American born and raised. Worked in India for 6 weeks while doing post-doc. Teaching at CU for 4 years.

Dr. Wehby. Professor.

Nationality: Lebanese born American, came to the U.S. as a graduate student

d) Faculty *from different nationalities*. People are usually representatives of their cultural environments. Decisions, thoughts, orientations to time and space, communication structures, and relationship orientations all depend on the experiences we had (Hofstede, 1991). People from different backgrounds each contribute differently to the overall picture of the department. Therefore, including faculty from different backgrounds gave a richer description of the department as a whole.

Faculty Name	**Country Born**	**Where he studied PhD**	**Position**	**Research Lab**	**International activity**	**Interview date**
Dr. Shelly	USA	USA	Associate Professor	Artificial intelligence	Conferences	4/20/2009
Dr. McLean	Ireland	USA	Professor	Database	Personal, Conferences, Collaborations	4/16/2009
Dr. Mohi	USA	USA	Professor	Embedded systems	Personal, Conferences	4/9/2009
Dr. Ionescu	Romania	USA	Assistant Professor	Programming & Software engineering	Personal, Conferences	4/13/2009

Mr. Smith	USA	USA	Lecturer	Embedded systems	Not much	4/10/2009
Dr. Phutan	India	USA	Chair and Professor	Computer Architecture	Personal, Conferences, Collaborations	4/22/2009
Dr. Perinski	Poland	Poland	Professor	Algorithms	Personal, Conferences, Collaborations	4/30/2009
Dr. Mark	Canada	USA	Professor	Networking	Personal, Conferences, Collaborations	4/8/2009
Dr. Tasos	Greece	Canada	Professor	Networking	Personal, Conferences, Collaborations	4/27/2009
Dr. Strong	USA	USA	Professor	Algorithms	Personal, Conferences	4/9/2009
Dr. Chang	China	USA	Professor	Algorithms	Personal, Conferences, Collaborations	4/14/2009
Dr. Lane	USA	USA	Professor	Programming & Software engineering	Not much	4/14/2009
Dr. Calsoyas	Greece	USA	Professor	Database	Personal, Conferences, Collaborations	4/28/2009
Dr. Wehby	Lebanon	USA	Professor	Computer Architecture	Conferences	4/23/2009

e) Students *both American and international at various stages of their studies.* First year students might have different expectations, attitudes, and views of the department than the third or fourth year students. This is

also true if they are local or international students because not only in terms of their experiences in the department, but also their expectations of job placement are big influences of what they anticipate from the department. American citizen students are considered natives regardless of where they were born. The “international students” are the ones that hold an F1 student visa to be in the United States. The data for the international student status (70% international) was obtained from the international student office of the university which counts the visa students as international. Therefore, foreign born naturalized citizens or green card holders are not included in the international student categorization.

Student Name	Country Born	International or Domestic Student	Year in PhD	Advisor	Research Lab	Interview date
Adam	Vietnam	Domestic	5	Dr. Shelly	Artificial Intelligence	4/21/09
Barry	Philippines	Domestic	1	Dr. McLean	Database	4/13/09
Johnny	Taiwan	Domestic	3	Dr. Chang	Algorithms	4/16/09
Belgin	Turkey	International	1	Dr. Shelly	Artificial Intelligence	4/17/09
Esra	Turkey	International	5	Not interviewed	Networking	4/15/09
Philip	Greece	International	4	Not interviewed	Database	4/29/09

Sofia	Greece	International	2	Dr. Mark	Networking	4/17/09
Wei	China	International	1	Dr. Tasos	Networking	4/29/09
Yueh	China	International	4	Dr. Shelly	Artificial Intelligence	4/20/09
Demetrius	Cyprus	International	4	Dr. Tasos	Networking	4/10/09
Murat	Turkey	International	2	Not interviewed	Networking	4/24/09
James	USA	Domestic	2	Dr. Tasos	Networking	4/8/09
Saachi	India	International	3	Dr. Mark	Networking	4/24/09
Tim	China	International	3	Dr. Tasos	Networking	4/15/09

Instrumentation

The primary instrument was the researcher for the data collection. The interviews were the main source of information for this study even though observations and document collection also took place. The reason for this is I believe I could interpret and understand meaning symbols easier by probing and using strategies of clarifying information from the informants directly in face-to-face interactions. The interviews for this project were performed on a face-to-face basis with about an hour for each informant with follow up meetings when needed.

The interview protocol shown in Appendix I guided the interview data collection. The interview protocol was submitted and approved by the Institutional Review Board of the university to be studied before the interviews took place. As soon

as the approval was received, the interviews were booked by e-mail according to the schedule of the participants. The questions were semi-structured questions in order to gain an understanding of the phenomenon of "globalization." The questions were categorized in four areas based on Knight's (2004) categories (economic, political, social/cultural, academic). The categories were mere guides to this vague phenomenon in terms of framing the research. These four areas are intermingled in the department in terms of finances, policies, social relationships and the academic field. Looking into these areas separately and observing if or how globalization is connected in these processes provided data that is used in answering the research questions.

I used the following strategies to get information from the informants:

a) *Hypothetical questions.* These are questions to create a hypothetical scene to put the informant in that situation. These kinds of questions usually show the stances the informants might take if a situation that isn't real were to arise, and their thinking process about a possibility. Although considered not the best kind of questions for qualitative inquiry because they limit the thinking process into testing circumstances; this information then can be useful in forming hypotheses or in this case, help to find out whether a particular program is achieving its aims. For example I asked: "Imagine that all the domestic students are highly qualified, what would be the percentage of domestic students to the international students do you think?" This question actually followed a direct question of "why are there so many international students?" and

after finding out the answers were in terms of 'lack of domestic students' qualifications.' By asking a hypothetical question, I could find out how their answers more specifically fit into what the department intends to achieve to what is actually happening.

I also asked the students, "If you could find the same job and make same amount of money here or back in your country, which would you take? What if it is another country?" These hypothetical situations tested also another previous direct question of "where will you work after graduating?" With mixed answers to the direct question, I wanted to clarify their intentions and attachments to a particular place or culture.

b) *Descriptive questions.* These are the most common type of qualitative interview questions where the informants are expected to elaborate. For example "Can you tell me your typical responsibilities?" would elicit a response that can be elaborated. There are five types of descriptive questions. 1) *Grand tour* questions refer to the locale of the investigation. It elicits the verbal description of important features of the cultural scene. For example, "Can you tell me the basic structure of this department?" 2) *Typical tour* questions are questions to understand how things usually are. For example, asking an administrator or professor "What is your usual day like?" 3) *Specific grand tour* questions that specifies a particular time or event such as "How did this department evolve over the years?" 4) *Guided grand tour* questions as the informant

to give an actual physical tour such as “Can you show me around the lab?”

c) *Example questions.* These questions ask the informant to give an example of a single act, for example, if the informant says “We have programs to help international students with their English”, the investigator might ask “Can you give me an example of that?”

d) *Experience question*. These kinds of questions merely ask the informants if they had any experiences in a particular setting. For example “You’ve probably had some interesting experiences working/studying here, can you tell me about one of them?”

Participant Observation

On first glance, participant observation appears to be just looking, listening, generally experiencing, and writing it all down. However, it is also personally demanding and analytically difficult. Participant observers pay attention to what appears to be everyday mundane happenings such as people’s body language and speech patterns, and their patterns of behavior in certain circumstances. In Cohen’s description of Mrs. Oublier (1990), describing her acts of behavior as well as speech, creates images in readers’ minds. However, because human perception is selective, it is very important to be a careful, systematic observer noting the limitations of the observations (Bogdan & Biklen, 1992).

Qualitative researchers often use participant observation as a strategy for both listening to people and watching them in a natural setting. The informants also become

actors in a particular environment (Spradley, 1979). As an observer, the investigator usually takes notes using a particular framework of concepts. For example, the way the I feel in an environment and the way I see people react to my existence in that particular environment become part of the natural setting I describe. My observations fell under five categories.

1) *The physical setting*. The department being observed was set in the engineering building, a relatively new building (5 years old) and the department occupies two floors of the 5 story building. The laboratories are large and well lit, with big bay windows both in the front and back of the rooms. It is easy to see who is in the lab when walking by them. The labs are locked and only the people who work in them have keys for security purposes. Inside the labs are big open spaces where many desks are placed with computers. It is easy to interact with people from desk to desk, there isn't much enclosure to isolate each person from one another. Inside the labs, there are also a small kitchen where there is a small refrigerator and coffee makers on a counter. No table or chairs are present but people stand and chat when they take a break. The labs seem to be fostering interaction with their open design within the rooms. Because people spend most of their time in their assigned labs, they seem not to be interacting so much during the day with the people in the other labs. The labs pretty much designate the interactions for the people within, like an office with people working in all day.

The faculty offices are on two floors and they are individual rooms separated from each other. Each faculty has their own office with a desk and book shelves, and each decorated them according to their own taste. There are chairs across from the desks for visitors or students. Most faculty had their doors open so it is easy to see who is in their office. I did not notice a faculty lounge where the faculty get together to interact. There was however a student lounge with tables and comfortable chairs to hang out. I observed it being a place not where people interacted but where they studied or listened to music individually. The labs had more interaction than the lounge. They were the main gathering place for both students and students and faculty.

The administrative offices were in a large space with a reception area in the middle and offices with open doors that face the middle section in a circle for the department chair, administrative assistant, financial assistant, graduate student advisor, payroll specialist and purchasing/travel assistant.

2) *The informants.* I describe who is in the scene, the number of people and their roles and the relevant characteristics of the people in the scene.

A total of 14 faculty members were interviewed. All of the faculty interviews except from one took place in the offices of the faculty. We closed the door to have more privacy and the faculty seemed comfortable in their environment. Some common behaviors that made me reach this

conclusion was that they leaned back in their chairs, answered phone calls when I was there, and their arms seemed relaxed and open. They all treated me like a student asking about what year I am, what I am studying and greeted me without getting up from their chairs. The faculty I met in the offices seemed like they wanted to get the interviews over with glancing at their watches and asking me how long it would take. However, they were polite and when I explained my research and why I needed them, they said they were glad to help out. I explained that even if I ask obvious questions, I didn't want to assume anything because I wanted everything to come from the data. I also let them know that my methodology is qualitative. One of them said they would be interested to see a quantitative research done on the subject and said "too bad" when I told him about my methodology. Nevertheless, they were polite and I concluded that they were meeting me either as a favor to me, as a student, or as a favor to their colleague who sent them e-mails saying I will be contacting them for interviews; not because they were interested in my research.

I also interviewed 14 students. When I contacted them to meet, I asked their help in my research and did not offer any incentives. However, I did give them chocolate at the end of the interviews to thank them, and they all were surprised but very pleased at my gesture thanking me several times. The students met me in the student lounge or outside where the

tables and chairs are. Even though I met with the students in open areas, the chairs we were sitting were enough distance away from others that our conversations were private. When I first met them, the expressions in their faces indicated that they met me out of curiosity. They stood up when I introduced myself and except from two of them who had appointments, they did not seem to be worried about time. Most of the interviews with the students did not take more than an hour anyway.

3) *Activities and interactions.* I tried to make note of the activities and identify if there are any definable sequence of events. Interactions of people is also very important to observe when describing the actions that are taking place. Cultural meanings guide thinking, feeling and acting all together; yet it is through the observation of the actions and behavior that we can negotiate the meaning that is attributed to the culture (Alvesson, 2002, Swidler, 2001).

The most notable interactions I noticed were among the students in the labs. There seemed to be a friendly atmosphere with jokes and conversations between desks. They were sharing information and seemed to be discussing research. The lab that I have observed was a mix of different nationality students mostly speaking English but also the same nationality people saying a few words in their own languages, and translating afterwards. On the board in the lab I noticed a list of Turkish words. I asked what they were and they said these words were the same

in Turkish and Hindi. The students were making intercultural connections by finding similarities other than the research they share.

I have not noted any interactions of the faculty in the offices because they each had their own office and I didn't attend any meetings. However, because I was staying with one of the faculty members, I saw that there was quite a friendship going on between faculty members in the department. They met outside the school setting for social purposes, helped each other fix cars or problems with their houses, shared birthdays, gave each other rides to the airport and carried out similar interactions that friends have. The students also interacted with the faculty joking around and discussing research in a very casual way in the labs. The students also mentioned Halloween parties at a faculty's house every year and how much fun they all have. I have been to one of these parties they talked about and I knew exactly what they were talking about.

4) *Conversations*. It is important to note the content and the manner of conversations that take place in this environment. Noting the silences and non-verbal behavior will give the description a rich perspective. This part of the discourse analysis gave powerful clues for this research project.

The faculty was polite and semi-formal with me. They used polite words and mostly refrained from slang, although at times, it slipped out. I noted

this when they said words in a lower voice or apologized sometimes right after saying it. They were very casual among themselves and with their students. I noticed they used slang more freely among themselves and even with their students.

5) *Subtle factors.* These are in terms of unplanned events, connotations or even what does not happen that is expected to happen (Patton, 1990). By paying attention to not just routine events but little nuances as well, I could paint a more detailed picture of the department.

The students felt awkward at first but quickly became comfortable with me. In the beginning of the interview, they mostly stuck to the questions, but later on, they were talking about their personal lives and seemed at ease with the interview. I believe because of my Turkish background, I noticed the Turkish students were quicker to warm up to me and share personal thoughts easier than other students. They also made remarks like “you know how it is” when they mentioned cultural differences such as dating or how hard the high school education is in Turkey. I started the initial conversation with them in Turkish but told them I would conduct the research in English because I didn’t want to go through translating. They had no problems with this as they were extremely proficient in English.

There were a couple more professors I would have liked to interview but after contacting them several times and realized their schedules did not

fit into mine, I gave up. One was on the graduate student recruitment committee and dealt with Indian candidates, and the other was the only woman faculty member.

6) My behavior. I was as much part of the scene as all the other participants. Therefore, defining my role and how others see me in that circumstance gave perspective to my observations. I also noted my thoughts and comments of my observations which can be an important part of my field notes (Merriam, 1998).

In the lab, people initially wondered who I was but after finding out, they pretty much ignored me. Once in a while I would be introduced to a Turkish student or one would ask how my studies are going. They seemed comfortable with having me around. I do not know how my presence influenced their behavior, but as for what they do for work, they seemed to be functioning fine. I was watching and noting what I see and I didn't see anyone staring or glancing at me, they worked at the computers or asked each other questions or went to the kitchen and got a drink. The design of the lab also was helpful of their comfort with my existence, because they are very open environments with a lot of people around.

The interviews were, I believe, influenced by my behavior. I introduced myself and acted like a student. I was dressed casually with jeans and a t-shirt and had a backpack. The students felt comfortable with me, I did

> detect a tad of respect from the students. It might be because of where I am in my studies or because I was much older than them. There were a lot of faculty around my age, but I felt like my status as a student was more powerful than my age in the interactions. The older the faculty, the more nurturing was their behavior (encouraging words about my study, their content facial expressions about helping me when I thanked them). The younger international faculty tried to make connections with me telling me stories about their experiences as an international person living abroad when they were students, or about their family situations (their spouse's nationality, asking me personal questions about my background). Younger American faculty was the most formal and mostly asked research questions not getting into any of my personal background or nationality.

Document Collection

Documents are also important sources of data collection. They are a product of the context in which they were produced and therefore relevant to the environment to be studied (Bogdan & Biklen, 1992). The documents in this study include web pages, brochures, regulation handbooks, departmental policy documents including mission statements and policies, written correspondence between me and the informants, and articles and papers by the informants. Looking at these documents could give me some of the necessary information that I cannot obtain otherwise.

I collected documents related the finances (financial reports, budget spreadsheets, and breakdowns of expenses, income for the department), the student recruitment (power points to recruit domestic students, brochures, generic letters sent to students, the website information), policies (policy documents about the mission of the department and requirements for the programs). These helped me analyze the department and the interviews because for example, when a participant mentioned something about the foreign competition on the incoming international student applications, I went to the documents and checked how their understanding of the competition matched the written documents.

Validity and Reliability

For qualitative research, the point is to gain a better insight on understanding how people construct meaning from real life experiences. Therefore, study findings need to be consistent with what happened in order for the research to be internally valid. For this study, the findings reflect the participants' perspectives at CS Department at CU and their perception of reality.

Merriam (1998) suggests four ways to enhance internal validity. These are triangulation, member checks, peer examination, and disclosing researcher's biases. Triangulation is defined as having multiple sources of evidence. In this study triangulation is obtained through interviews, participant observation and document analysis. Second, member checks is interpreting data and reporting it back to the participants. This process was mainly done during the interview process as a part of the clarification. There were only a few cases (five out of 28 interviews) where the

reporting was done after the initial interview and feedback was received. Peer examination is consulting with colleagues to discuss the procedures and findings as they were performed. I talked to my peers and asked them to evaluate some non-identifiable data from the interview transcripts. I gave excerpts to three friends without the researcher's questions and what I was looking for, and asked them how they would evaluate the tone of the interviewees. I wanted to see if what I think is happening is also what others notice in subtle cases. For example, I noticed stuttering and a change of demeanor in some interviews which I identified as discomfort; but I wasn't sure if it showed in the transcripts. The peer reviews confirmed my understanding in those cases. Lastly, the researcher's biases such as assumptions and perspectives were disclosed in the interpretation of the study.

Ethical Issues

Reliable research should be conducted in an ethical way. Qualitative research is usually intrusive and it is important to protect the human subjects from harm. Therefore, the "human subjects" tutorial was performed and approval was obtained before conducting the research. Instead of real names, pseudonyms were used. Also, while collecting information, researcher was conscious about documenting only the information that was observed and recordings were used not to let researcher bias in the collection of data.

Data Collection

As soon as the IRB approval was obtained, I as the researcher started collecting data. The data collection took 6 weeks total with more than 40 hours of interviews and

observations. Participants were contacted by e-mail and once they agreed, meetings took place at a place determined by the participant. The participants were assured that the interviews are confidential and that they would not be identified in the reporting of the study. Also they were informed that they could withdraw from the study at anytime which none of them did.

The Role of the Researcher

I as the researcher used clear, in depth description of the data as she experienced it for clear interpretation. I used methods learned from authors I studied and relied on communication skills gained from my interpersonal experiences. I also used probing to clarify ambiguous questions. During the interviews and the interaction with the participants, my attitude was informal and polite and I was respectful to the participants in a friendly manner. Apart from introducing myself and the research, injecting (and asking) personal information where appropriate brought the interviews to a more conversational level and increased the personal connection with the participants. For example, I disclosed my international background immediately to comfort international participants. Also if I noticed any similarities of family or location, I mentioned them in order to make the participants warm up to me as a person as well as a researcher and a student.

Each interview with the exception of two faculty and three students was taped after being approved by the individual participant. The reasons for the ones not taped were technical problems. During the interviews, I also took notes. When transcribing, the hand notes were also added to the transcriptions. The note taking was supplementary

and mainly included my perceptions as I spent most of the time observing the tone, manner and body language of the interviewee when listening. These were important details in the analysis of the data.

Interview Data

According to Denzin (2001), for over a century, the interview has been the indispensable information gathering tool of the social sciences. It is estimated that 90percent of all social science investigations use interview data (Holstein and Gubrium, 1995). Interviews are part of the conversational dialogues that connects us to a cultural community. They transform information into shared experience (Denzin, 2001). This experience suggests that "words and language have a material presence in the world; that words have effects on people. Words matter" (Denzin, 2001, p. 24).

Dillard (1982) suggests that the interview acts as a narrative mechanism that allows people to tell stories in which the interviewer and the interviewee share the goal of participating in an experience. In this sense, the interview is not a mirror to the external world or a window to the inner life of the person, but a perfectly coherent miniature world in its own right that reveals a common goal. This project relies heavily on the interview data for this particular purpose of creating a world defined by the interaction as well as the respondents' definition of their own experiences. This process adds depth to our understanding the phenomenon of globalization in how respondents construct and define their own experiences in response to the projection of the interviewer.

There have been respectable sociological studies that rely primarily on interview data such as Swidler's Talk of Love (2001). In her book, Swidler's data consisted of 88 interviews of white upper-middle class suburban Northern Californians. Methodologically, she makes the actor the center of her proposed model of cultural process and adds to the literature showing how self is actively constructed in interaction. On the subject of relying heavily on interview data, Swidler explains "While culture is widely understood as an emergent property of collectivities, the methods we use keep pulling us back towards interview-situated accounts and an image of culture as located in individual experience. Scholars who seek to access supra-individual semiotic structures by studying public rituals and other collectively created and changed in situ (Swidler, 2005, p. 2).

Swidler's main research questions were to find out what people think with and how people gather resources when they think (2001). In this project, similarly, I wanted to experience the understanding of the phenomenon of globalization from the respondents in a way that captured their thoughts in action. Swidler's methodological approach provides a chance to link culture and experience while exploring how meaning is simultaneously created and appropriated. In this dissertation, direct and indirect approaches to the same subject in question created different reactions and accounts. These differential understandings can only be achieved through a negotiation of meaning. Rather than centering analysis on categorizations of globalization as Knight and de Wit did; I saw that the actor being the starting point of analysis revealed how globalization comes into the discourse and in which circumstances.

"The interview is simultaneously the site for conversation, a discursive method and a communicative format that produces knowledge" (Denzin, 2001, p. 27). Many things shape how a researcher interprets data. The research questions, design, and theoretical foundation no doubt influence the analysis of interview data. In addition, particular attitudes, personality and the relationship that is built, as well as the intended audience can influence the negotiated meaning. Luttrell (2000, p. 499) mentions in her article Good Enough Methods for Ethnographic Research that "I don't believe that researchers can eliminate tensions, contradictions, or power imbalances, but, I do believe we can (and should) name them." By including these nuances in the data that is collected through interviews, the dynamic characteristic of the interviews are highlighted and reflexive narrative is formed.

Reflexivity is a circular relationship. The reflexive interview elicits interpretations of the world and at the same time has an interpretive relationship to the world it creates. Lutterell (2000) mentions that being reflexive is not an absolute concept; rather develops with experience: "I think of being reflexive as an exercise sustaining multiple and sometimes opposing emotions, keeping alive contradictory ways of theorizing the world, seeking compatibility, not necessarily consensus. Being reflexive means expanding, rather than narrowing the social, cultural and political fields of analysis" (p. 512). In her analysis of her work Schoolsmart and Motherwise (1997), she notes that her work transformed from initially searching for the truth to making connections and relationships to interpret the subjects' reconstruction of thoughts and memories. She also notes "Another lesson to be drawn from my fieldwork is the extent

to which respondents shape the research process. I didn't plan my project to be about life stories, but the subjects of my research had their own notions of what my project was about" (Lutterell, 2000, p. 518). In the same way, during the process of my interviews, I sensed that my respondents had their own notions of what my project was about and it was the tensions and the interactive relationship that made me realize what I am searching may not be what they are trying to tell me.

The interviews accounted for the main source of data also for the fact that my main objective was to understand the experience of the participants and it was not possible for me to directly observe my informants' experiences. Therefore, I relied on the respondents' ability to reflectively tell the aspects of their experience and communicate them through language. I understand the limitations of this as it would be impossible to capture the whole experience in words. However, like I mentioned before, the project is a reflexive account of a shared experience. That is, although it is not possible to have total access of our experiences, we do have access to them and they reflect concerns of the participants , what they want to reveal, present mood or the interviewer's style and suggestions. The interviews then provide an occasion for reflection on the meaning that is explored for the study (Polkinghorne, 2005).

Data Analysis

After the data collection was complete, the audio tapes were transcribed and the content was analyzed to identify patterns or themes relevant to the study. Answers to interview questions as well as conversations and information offered, field notes including non verbal descriptions and the environment were analyzed carefully. The

first step was to read all the data several times. Then the data were subdivided into categories that showed a pattern. For example, each answer given to a particular question was combined first, and then from that, themes or patterns were identified from the answers. What the informants said, what they didn't say, how they said it, how they reacted to certain elements was noted. Their demeanor, comfort level, gestures and remarks were noted and commonalities were noted. How they reacted to me as the researcher and to the study was included in the data. The analysis also tried to identify if any elements in the literature review existed in the study to help explain what is going on. Overall, I tried to create a rich description of the environment in which the study took place.

Developing the Coding Procedures

Managing and analyzing data was the most tedious part of the research procedure. I explored to use initially a computer program ATLAS ti; however later decided to manually produce by copying and pasting to produce matrices as I felt I could be more comfortable and in control with handling the data. I had three levels of analysis in interpreting the data.

Level One:

Initially, my analysis started with reading the transcripts in their entirety at least three times to remember each interview and the people associated with the interviews. After reading each interview, I could stimulate my memory of not only the words provided, but also how I felt throughout the interview and how I perceived to be the attitude of the respondents. After this process, I have decided to collect together the

initial understanding of what globalization in general means to the participants. I selected the answers to the general question of "what is globalization?" I copied and pasted all the answers to this question into a new document and read the answers. I did this in the order of the dates of interviews. I started seeing patterns in the answers and put the answers together with the patterns. The patterns included the general associations and detail given in the answers. Two themes surfaced as a result of this. There were a number of answers with no reference to personal matters and detailed descriptions of economic and academic themes as related to globalization. There were also answers with succinct explanations as related to cultural and personal qualities globalization represented. From this, I put these kinds of answers together and came up with two columns. Then I traced back the answers to see which answer corresponded with which informant. This is the first time I realized the distinct difference between the answers of the faculty to the answers of the students. The categorization of the differences between the faculty and the students initially came out of this procedure. I also paid attention to the backgrounds and nationalities of the informants to see if there are some patterns in this way, however, no distinct differences or patterns found in this categorization as related to the interpretation of globalization. I included the experience level of the informants such as how long they have been a student or faculty in the department and this category also did not produce any distinct patterns to note in the answer to the question. I repeated this procedure of putting together answers to the questions and looking for patterns and salient themes, then analyzing them in the light of the research questions, the institution, the informants' backgrounds, attitudes, the

literature reviewed, and my experiences and expectations. The strong distinctions between the categories of the students and the faculty answers became very salient at the end of these procedures.

Level Two

There were certain themes and vocabulary that was repeated in the interviews. For example, the theme of the "ranking" showed up in several answers to various questions. There was a cross reference to this theme as it appeared not only in an answer to one type of question but in various questions. For example the most I noticed this theme was in the question "What is the most important mission for the department?" However, there were also other times when the ranking was mentioned. When I asked about finances, culture, the research areas, the vocabulary of "ranking" kept appearing in both the faculty's and the students' answers. There were also this large cyclical theme of ranking increasing the prestige of the department, the quality research and publications helping to establish the prestige, the quality students providing quality research, and grant money to support the students. This cycle was mentioned by almost all of the participants in the interviews and seemed to be the central component for the legitimacy of the department. From the answers, I decided to look at the themes that kept appearing in this cycle. For example, I have identified the transcripts when ranking was mentioned and what was said about this issue. I also read several documents related to the ranking of the department and how these rankings were established in order to comprehensively cover the theme. The same procedure was done for the themes of research and funding and finding quality students. I read the observations and the

interviews again in light of these surfacing themes and tried to make sense out of them in the viewpoint of globalization.

Level Three

This is the level of analysis where I analyze the themes and findings in the light of the institutional theory and bring in the legitimacy aspect of neo-institutional theory. Swidler (2001) mentioned that institutions have core meanings that define their purposes. She also adds that all institutions have "signaling systems that permit monitoring and enforcement of the basic structures of the institution" (p. 204). The institutional order is culturally constructed. Therefore, identifying the cultural structures and the elements that influence these structures guided me towards a new understanding of the concept of globalization. As I went through the analysis of the important elements for the department, I started seeing that globalization, no matter how people defined it, was not an entity that influenced the cultural set of the institution. It was rather becoming more evident that what is defined as globalization, the interdependence and flow of people, knowledge and goods among nations in the world, is actually a consequence of the goals and help the survival of the institution.

In summary, the coding and identifying the fragments of the data into separate categories helped to look at the details. Then, combining these pieces together helped to reconstruct an explanation. Overall, the approach in this study was to come up with clusters, patterns or themes that are linked together. The variations in the data are also identified and analyzed by the components they represented. Explanations included mostly the patterns but variations are included to enhance credibility of the research

overall. In this study I followed a three layer analyzing process about the data. First to look at individual responses and identify similarities, second layer identified patterns across categories, and the third layer situated the current project with respect to prior research and theories that had been raised by the broader literature relating to the project. These layers were not separate but they were interconnected throughout the analysis process. Based on the analyses, then, I was able to move forward and think about the implications of the project for the field and also for future research.

Chapter 4

Findings

Description of the Site

Location

The University where the department of computer science under study is part of the state public university system, a system recognized as one of the finest public university systems in the world. It is located in a city with a mild and pleasant climate and is advertised as central to Southern California's many attractions such as beaches, mountains, large cities (department website). Although this centrality is attractive, distance makes having a car a necessary part of accessing the region, a fact that sometimes come as a surprise to international students. Some mentioned this when asked what they thought about the campus and location:

> **Adam:** You can't do anything without a car; all those pictures in the brochures are at least an hour's drive away.
>
> **Belgin:** I thought it would be easy to walk to places and use buses, but there is no public transportation!
>
> **Wei:** I tried to tell my parents (back in China) that I *need* a car, but they think I am being spoiled.
>
> **Demetrius:** It is not possible to live here without a car.

These comments indicate that the students were disappointed to find out this problem of practicality after they arrive at the university.

The location of the School of Engineering in which the department of Computer Science exists is on the west side of a campus of 19 thousand students. The building serves more than 2100 students and faculty. The building is long and rectangular and the mid section is an open air courtyard with benches and a couple of trees. The Computer Science department is on the north side of the building on the 3rd and 4th floors of a five story building. The Computer Science Department has over 500 undergraduate students and about 150 graduate students.

The student lounge is downstairs at the entrance level and it is a large room capable of holding about a hundred students with arrangements of several groups of comfortable chairs. I have gone to this building almost every day over a two month period and have never seen more than two or three students using the lounge. The students told me that sometimes they have events such as pizza parties there but said that they are rare, once or twice a quarter. I have observed that for most of the graduate students, the preferred gathering place, both socially and work related, is their laboratory. There are six labs in the department. Each lab has between 10-20 people that are made up of 3-4 professors and graduate students. The labs are located on the east side of the building on two floors. The labs have locked doors as they have highly expensive computing equipment but have very large windows on both the side towards the door and to the outside which makes them bright and easily visible from outside from the building hallway. In the labs there are several desks with computers in an open layout in one large room, no walls between them. There is a small kitchen with a couple chairs inside the labs. In the back there are some white boards on the wall. Almost all

students have mentioned that they spend most of their time in the lab. Time was spent observing in two of the six labs. One was the Networks and Communications lab. In that lab, there were four Greek, three Indian, two Turkish, two Chinese, one Eritrean, one Italian and one American student; two Indian, one Greek and one Canadian professor. I knew one of the professors and one of the students well as they are my friends. When I went to observe for the first time, I quietly sat at my student friend's desk. Immediately, everyone was curious regarding who I was. They looked at me and some of them approached me or my friend to ask who I was. After explaining to them that I am a student and doing research observing their lab, they went back to their work and did not pay attention to me. I brought a box of chocolate everyday that I was there so people looked forward to see me and were very friendly with me. Mostly they worked at their desks working on the computer but there was also a lot of interaction showing their work on the computer to each other, discussing work at each other's desks and socializing at or in front of the kitchen. I have noticed that all of the people were very comfortable with each other and joked and made plans for meetings apart from work as well. The friendships involved mixed nationalities. They interacted with the professors with the same friendliness and it seemed like a very informal atmosphere.

The other lab I have observed was the Programming Languages and Software Engineering lab. In this lab there were five Chinese, one Indian and one American student; one Indian, one Italian and one Romanian professor. This lab was smaller than the networking lab but the layout was similar. I did not know anyone personally in the lab; I just had interviewed one of the professors from this lab earlier. They were very

friendly also and let me sit and take notes at one of the desks. Because there were many Chinese students, sometimes they spoke Chinese when discussing their work. When a non-Chinese or a professor approached they immediately switched to English and explained what they were discussing. I did not notice that bothering anyone, it seemed like speaking the native tongue came naturally as it would for me, and did not seem like it was done deliberately to keep anyone out. The students came and left individually mostly, going out in pairs for lunch occasionally. Again, the professors were very informal and friendly with the students and the students seemed comfortable with this.

The administration offices with the chair's office and all the administrative assistants' offices were on the third floor on the north side of the building. From the hallway the reception area was visible with large glass wall where the door is located. In the middle of the reception area, there were three cubicles where the student assistants worked. All six of the offices' doors opened to the round reception area. The doors of the offices were always open. On the west side, there was the office for the Purchasing/Travel assistant, next to it was a large bright office with a meeting table and the desk for the chair. Next to the chair's office were the Payroll Specialist, Graduate Student Affairs Officer, Financial and Administrative Officer and Financial Analyst's offices.

There were students and professors going in and out during the day and the staff was welcoming and helpful. When I approached the administrative Officer about my intent to interview the chair and get some information from a few of the staff members, they were open and helpful and made an appointment for me quickly. They seemed to

be used to helping students on different matters and me asking for something like that did not seem to surprise or bother them. They were polite and made time for me to answer my questions. I was also very friendly in my approach, smiling and apologized for bothering them before I even asked anything. I explained who I was and why I was there and that I needed their help if they would be willing to spend some time with me. When I met with the chair, we closed the door and sat at the meeting table and he was friendly and seemed sincere in his answering my questions. He also asked me questions about my studies, my background, how I came to this university and how long I have been here. He seemed very proud of the department and mentioned that he enjoyed being the chair. The staff also talked very positively about the interactions and seemed to like to work there. They were passionate about answering questions about their jobs with animated demeanor and using positive adjectives. Many of them mentioned that this was the friendliest place they have ever worked at.

History and Background of the Department

According to the departmental website and veteran professors who have been with the department from the beginning, this is a fairly new department. The computer science department "grew out of computer science oriented degree tracks in the departments of Mathematics and Applied Science in the early 1970s, and became a department in 1990" (department website). One professor, who had been the chair for the 10 of the last 15 years, explains the history in an excerpt from an interview:

> **Dr. Lane:** I went into mathematical logic. So I came here, but there weren't any other logicians at UCR. They wanted somebody to help get the campus

into computer science and asked if I wanted to help out, so I did. So I was involved with getting computer science as a discipline here. One thing led to another, we first developed a degree track for Bachelor of Science in mathematics, a computer science track. This was about in 1972, and then in 1976 we developed a separate degree, a BS degree in computer science, still in the math department. Early 80s we changed the name of the department from mathematics to math and computer science (CS). We also started a master's degree in CS. In 1990 we split off as a separate department and started a PhD program in CS. In 92, the computer science department became a part of the college of engineering, newly formed college of engineering. In 1994 our PhD program was approved. In 97, 98 we changed the name of the department from computer science to computer science and engineering.

That's the history of the development there.

Researcher: It's a rapidly expanding department as far as I understand..

Dr. Lane: Well, expanded very rapidly for a while. Then with the dot com bust there's been a decline in student interest in computer science. Pretty sharp decline, and now it is growing again. So the student interest is growing that shows up in enrollments and the presumably faculty growth within the next few years but not right now.

Researcher: Was it always international, the faculty also?

Dr. Lane: Yeah, the faculty has always been international; the graduate students have always been international. The undergraduates has always been residents, though the ethnicity shifted largely towards Asian.

My uncle, who is from Iran, has graduated with a PhD from the Statistics department with an emphasis on computer science in 1979 have also added to the history from his perspective:

My uncle: During my time there was no Computer Science Department. Computer courses were offered in Math and as well as in Statistics Departments and some Modeling, Simulations and Systems analysis in Business Administration Department and I did take those courses in all those departments.

I graduated from the Statistics Department 1979. In Later years when I was teaching at Cal State the Math Dept. offered graduate work in Computer Sci. and I took several courses then (1980's). The quality of teaching except a few professors was not that great and mostly were teaching math rather computer. They had a guy from Germany who was teaching Compilers and Unix who did not do a good job and later let him go back to Germany.

To promote the computer program Dr. Thompson worked exceptionally hard and eventually I heard he created a separate Computer Science Dept. That's how much I remember from my time. During those times, about half of all the graduate students were international students 25% who were in masters program. The Profs were mostly Americans except the German guy and we

had an Iranian professor graduate of USC and was teaching in Oregon and taught for a year and left for more money back to Oregon. He was very good. I did not hang out much in the department since I was teaching and running a couple of businesses.

Demographics of the Department

There are 120 PhD students in the department and 85 of them are international students which makes a little over 70% of the graduate students (international student office). These international students are the ones that hold a student visa to be in this country, they do not include foreign-born or naturalized citizens or second generation immigrants. All 20 of the professors in the department are American citizens but 15 of them are foreign-born and came to the U.S. as international students.

What is Globalization?

The guiding question for this study is how do the people in the computer science department understand the concept of globalization? In order to shed light into their interpretations of this concept, initially, I asked them to describe it.

The following is the actual question I asked:

What comes to your mind when you hear the word globalization? I am not looking for a universal definition. I am wondering what *you* think about when you hear the word globalization.

The Faculty View

The faculty answers were mostly general definitions giving examples from business world or academic world. Their rendition did not include examples from

specific personal experiences but more of general concepts. Whereas the students' answers were mostly from their background or personal experiences. The examples they gave were mostly in terms of social or intercultural interactions. The faculty did not talk much about the social or cultural aspects of globalization while answering this question.

For example, Dr. Chang is from China and came to the U.S. as a PhD student. He had a scholarship from the Chinese government to study in the United States. He has worked in Canada as a professor in one university before joining this university ten years ago. He also holds visiting positions at one Chinese university and one research center in China. He is serving on editorial boards of many scholarly journals in the computer science field and has published extensively in scholarly journals around the world including French, German, Chinese and Indian journals as well as numerous American journals. His area is working on algorithms and software for computational problems in biology and genomics, which combines computer science with molecular biology. He defines globalization in the light of academics:

> **Dr. Chang:** First, research is global. You know research should never be limited to one country, right? I think when I hear the term, I would think more about the globalization of education. So for example I was reading on the internet that, some universities actually require the study abroad program, or certain programs like MBA for example. This is because I think the world is becoming smaller. And the business happens across borders, so globalization of education is becoming basically a necessity in good educational system

Here, Dr Chang explains globalization in terms of education. His remark "research should never be limited to one country" refers to his experiences in his collaborations with people around the world in his area of research. He also gives an example of universities requiring "study abroad" programs which his department does not. Most of the graduate students in the computer science department are international; however there is no study abroad program for domestic students to go to universities abroad at this particular department. His view in the area of sharing knowledge and research not being limited to one country shows his view of education as an international enterprise.

Another professor, an Indian professor (Dr. Phutan), who also came to the U.S. as a PhD student, shared this view of globalization in academics:

> **Dr. Phutan:** Well…I think…In academics, globalization is always there. It is too dense globally. We go and present papers like papers which are rare globally, our attractions are global attractions. So like you say who looks at globalization. From the very beginning any academic institution, even your area also, probably will do global relations in terms of research. Our professors also go and give lectures at many other universities. We promote international activities, this university does promote it. These are the normal things we do. Probably everyone does it. Our products are research papers, right; maybe our graduates too, they go globally you know.

Dr. Phutan also mentions research as a platform for globalization. The international activities that he mentions in terms of the university promoting it are on the lines of collaborations with other universities in the world. He, like Dr. Chang, gives lectures and collaborates at universities outside the United States. Dr. Phutan has also been employed with this university for 10 years. Before that, he was employed by universities in United States and Canada. Dr. Phutan's research funding comes from mainly U.S. government agencies as well as two U.S. based companies. When he says "our products" being research papers and graduates; and "our professors" he means the institution. This professor is the chair of the department, therefore he identifies with the department and the institution. When he mentions the "international activities" being "normal" and that "probably everyone does it," it gives the indication of comparison of other similar institutions. This is a characteristic of neo-institutional isomorphism. Deephouse and Carter (2005) mention that organizations complying with commonly used strategies, structures and practices seem reasonable and sensible to the social system of which they are a part of. Dr. Phutan here is trying to show that the international activity is "normal" meaning acceptable and legitimate because "everyone does it."

A Greek professor, Dr. Calsoyas, again addresses globalization in general terms:

Dr. Calsoyas: I am not really sure but basically everything is connected in the world. What we do affects others. There aren't many divisions anymore. For example when you search a library journal now it is so easy to find

anything anywhere. You know exactly what other people are doing. Distribution of information is now global.

The example he gives in order to define or explain "globalization" is related to the "distribution of information." Dr. Calsoyas, has also come to United States to get a PhD in Computer Science and is a graduate of one of the top universities in the field in United States. He has been employed with this university for 13 years and he has published in many national and international journals. He is currently an editor in several international journals in this particular area of computer science which is database management. Dr. Calsoyas explains his interest in coming to United States as a result of the influence of a Greek-American professor who was teaching in Greece in his sabbatical year. "That was a big impact for me. Then I applied to (U.S.) grad schools and this guy wrote to Columbia University to recommend me."

Other professors define globalization in a market or business sense. One professor, Dr. McLean who is Irish came to the U.S. through winning an immigration lottery at age 19 and worked for many years before deciding to go to college. He defines globalization as:

> **Dr. McLean:** It's kind of vague, I mean, it makes more sense in the business sense. You know when the local market maybe doesn't work anymore, you have to think more globally so the supplies come from places, your customers come from strange places, your staff can be outsourced from many places. Your market in many places, I think it's more of a business thing

Along the same lines, an American lecturer John Smith, explains globalization in terms of job distribution and businesses trying to make money. Mr. Smith has gone to this university both as an undergraduate and graduate in the field of computer science. He is still working on getting his PhD completed. He had quit the program as a student because of personal reasons and was offered a lecturer position six years ago and he has since worked at this university.

> **Mr. Smith:** Globalization…It's not exactly that we don't have countries anymore, but any kind of business or work what you are gonna do is gonna have impact around the world. Most businesses nowadays are looking how they can, not just make money here in the United States,but also how they can make money everywhere across the world in any country. Obviously we have things like a lot of our jobs (chuckles) seem to be going overseas, so when I think of globalization I also think of the negative aspects of it.

Mr. Smith is explaining globalization as jobs going overseas and identifies this as a negative aspect. He also mentions the businesses having a larger marketplace and seeking more profits worldwide.

Another professor Dr. Lane, who has been with this department since its separation from the mathematics department in the 1970s shares Mr. Smith's notion of globalization. He had been the chair for 10 years and was involved in establishing this discipline as a separate department in this university.

> **Dr. Lane:** It is a pretty broad concept. I mean there are a lot of components. A single world wide economy in some sense, which gets into competition

with manufacturing industry in the US, off shoring, of course, and some of that's coming back, the competition for American workers is felt through this mechanism.

In the views of faculty, globalization is identified both in academic terms and business terms. They address globalization as industries legitimately utilizing global connectivity to their financial advantage in terms of international manufacturing, marketing and outsourcing. In academics, the faculty is aware of the research implications of globalization such as distribution of information and exchange of scholars. The faculty mostly answers the question in general descriptive ways and their examples are institutional rather than personal.

The Student View

The students, on the other hand, see globalization in terms of cultural interchange. Their accounts are similar to Little (2003), Zeera (2001) and Spring (2008)'s description of "globalization" as they mentioned that the ease of communication and mobility allowing people to borrow from multiple models in the global flow of ideas and different ways of seeing the world enriching educational experiences.

A Chinese student expresses her views on the subject:

Yueh: I think in a community like CS there is more international activity. The conferences, getting feedback from others. Many people know each other's culture.

Another student, a Turk offers a similar notion:

> **Esra:** Not only being a citizen of your country but being a citizen of the world. Everyone is part of the world. I am not only dealing with Turkish people but with other nationalities as well.

Again, an Indian student expresses her views with the words:

> **Saachi:** I think I feel people are not limited to the resources of their countries anymore. Citizens of the world going beyond your comfort zone of cultural practices. I am from India, I can function in the US easily.

A Greek student defines globalization as:

> **Sofia:** I think it is normal to happen. If you take Europe, it tries to become like the U.S. Europe does it (globalization) in a restricted area…What is going on in a country is expanded to global view. People communicate and trade in a larger area.

The idea of *people* connecting with each other in the world is emphasized with these students' views. In all these views, a liberation, or expanding is the main component of their argument.

There have also been students who have mentioned the business aspects of globalization just like the faculty. For example, one Taiwanese student mentions:

> **Johnny:** I think it means you have to think big. You may be competing [with] the whole world, not just people surrounding you. If you want to sell a product, the market is the world, it is not limited to one country. A lot of companies in Taiwan advertise in English.

A student from Cyprus expresses his views:

> **Demetrius:** People have the same standard, no matter where they are from they share similarities in social, economic and career lives.

An American student explains globalization as:

> **James:** Historically we have been isolated. I picture globalization as global government and not just individual groups, especially in economics and science.

The variations among the students and the faculty of what an acceptable answer to the question of globalization can be analyzed by using the theory of legitimacy. People usually express their views according to what is acceptable in their minds. People usually say what they believe. As we have seen in literature, internal legitimacy is the belief of an individual that his views or the role he plays are justifiable and acceptable to him/herself (Deephouse & Carter, 2005). In other words, what is a legitimate answer to an individual depends on what he finds justifiable. In the case of the professors, a more general, academic or business sense is expressed defining globalization. The examples were given mostly as institutions or businesses. The students talked about more in a personal sense. This may indicate that globalization is a concept seems legitimate in an institutional sense to the faculty, but to the students, its legitimacy is accepted personally.

Attitudes Towards Globalization

When asked about "How do you feel about that (namely globalization)?" the faculty answers were short and dismissive whereas the students gave more explanatory

answers. This question was asked to see their personal views of the phenomenon in terms of evaluation. In the literature, it is stated that globalization may be interpreted as a source of creativity and learning, or competition and imbalance; after all, it is said that people give meaning to what they perceive (Hayden, Levi, Thompson, 2007). The perceptions of the global changes may give the people a stance over the actions they take.

Although some of the faculty answers indicated a positive attitude in the words: “It’s great” “Citizen of the world, man!” “I love it” “Sure, it’s wonderful,” there is a dismissal of the question in others as “There’s nothing to feel, it’s like the weather, it is there,” “I think it is happening and it will continue to happen,” “I have a hard time answering that because I don’t really know what globalization is,” and “Globalization is inevitable. There is no point discussing if it is good or bad.”

The answers where the faculty did not want to evaluate the phenomenon of globalization indicate that they did not want to take a stance or interact with the notion of globalization from a personal viewpoint. They defined it when asked in a general way, but did not to go deeper into the concept.

The students’ answers on the other hand, indicated they had more thoughts on the subject. They had no trouble expressing their stance on the subject and explained why they had that position. Here are some examples of that:

> **Demetrius:** It is a positive thing, people can’t function without each other; countries can’t function without other countries. It’s like a big community.

Saachi: It is good. I also think it is essential. It makes wider perspective, increases interaction, decreases skepticism about people from other nations.

Esra: When I learn things from people from different places, I feel privileged, for example there are Indian students tell us about some cultural things about India. I wouldn't know those things if I didn't meet these people, I wouldn't think of researching that because I wouldn't know what to research, you know what I mean. It doesn't come naturally, I guess it's a good thing….to expand knowledge.

Murat: To be honest, I don't have established thoughts about that, but it feels good to me. I learn something new about other cultures from the people I work with.

The answers indicated that the students take globalization personally and respond to it from a personal standpoint. "It feels good to me" indicates that globalization is something that is tangible to them. Talking about globalization personally, or giving opinions about it seems acceptable as they indicate no discomfort or dismiss the question or the answer. This acceptability is questioned when faculty answers the question. The quick, short dismissive attitude indicates that they are not interested in discussing globalization. Although some of them used words like "it is great", the words followed no explanation or elaboration. There was usually an awkward silence following the remark and a change of subject. The question also seemed not logical to them as some of them dismiss the question saying "…globalization is inevitable, there is no point discussing if it is good or bad". Here

also they decline to state personal feelings and take the concept as non-tangible and something beyond their control, therefore pointless to discuss.

The initial and general question of “what is globalization?” revealed some idea of what kinds of concepts the word “globalization” brought to the people’s minds in the department. From all the responses, I could conclude that all the participants’ were familiar with this word. Nobody said “I have never heard of this term.” There were different interpretations of the vocabulary and I tried to analyze the differences. Because “globalization” is such a general and widely used word, I was also curious about the connotation or the feeling it brought to people. I wanted to bring this general concept to a personal level and see what it really means to the people participating. My approach to find out about their feelings about globalization worked on the students and I got personal answers about how they view this phenomenon. On the other hand, the faculty, although they could explain in their words what globalization is, didn’t bring the question to quite a personal level as the students did.

Globalization Through the Four Dimensions

In the beginning of the project, I have indicated that I would be looking at globalization through the four lenses identified by Knight (2004) and the American Council of Education (2005) in the dimensions of economic, political, academic and social/cultural. The four dimensions of globalization as reviewed in the literature were investigated in the department through the interviews and observations and document collection. The following section sheds light on the findings in those areas.

Globalization Through the Economic Lens

In the literature economic globalization encompasses certain conditions such as growth in overall importing and exporting between countries, Foreign Direct Investments (FDI) increasing, having a commercial purpose for research and development, and the competition of higher education institutions for monetary gain from global resources to benefit their institutions.

Considering the first point, overall growth in importing and exporting between countries, I considered what could be considered as imports and exports for a computer department. As far as equipment goes, the department gets the computers from a national supplier and I did not really look into where the supplier gets the equipment. One thing I found out is that this department itself does not import or export goods or equipment. As far as the people or the workforce goes, the direction seems to be in terms of importing; that is, there are a lot of international people working in the department. However, as I have inquired if anyone has left the department to move to another country, faculty indicated that it has not happened so far. When I asked if they would consider relocating, most of them indicated it is possible but it would be a difficult option even hypothetically.

Researcher: Would you go to another country for work?

Dr. Phutan: Probably not. I have my family here and I go back to India to give visiting lectures in India.

Dr. Lane: Well it would depend if my wife could get work. She has a job she likes very much.

Dr. Calsoyas: It would be very difficult because I have 4 kids and my wife is a physician with a job in LA. I would go for a sabbatical maybe.

Dr. Shelly: I feel I traveled a lot in the world especially in Europe so I feel comfortable traveling abroad but living there for extended period of time would be difficult for me.

Dr. Mohi: Temporarily sure, permanently, I don't know, that's quite hypothetical so I don't know.

Dr. Perinski: I really like Riverside.

Dr. Mark: My wife doesn't really want to leave CA so other than going temporarily for a sabbatical or something like that I could not imagine relocating permanently.

Dr. Tasos: California is good so I don't need to move from here.

In the students' corner, it is similar. There are no study abroad programs in the department, and the students that come from abroad, tend to stay according to the alumni page that indicates the work places of graduates, and the faculty testimonies. This department did not quite seem to exhibit the international increase in imports and exports as indicated by the literature in defining economic globalization.

The second area economically is the increase in the overall foreign direct investments which can be defined as the investment of foreign assets into domestic structures, equipment, and organizations. The department is a part of a state university system; therefore, it is funded mainly by the state. There are also some testimonies that explain that the grants for the projects for the department come from domestic sources,

mainly the government and NSF funding. This department gets over 5 million dollars for operational budget and the funding sources include less than 1 % of the budget from international sources. Typically, the majority of the funding awards for the department come from Federal sources (about 63%), then comes state, other government and non-profit organizations. Less than 6% comes from the industry which might include international companies (Annual Fiscal Report, 2009).

Following the third point, having a commercial purpose for research and development is explained as universities taking over patentable research, and money making becoming the main purpose of the department. As far as the testimonies in the department, although getting grants to perform research is an important part of the department, the main goal is identified as having a higher ranking department in the computer science field. The grants and the money is indicated as the means to achieve this goal. This is not quite the idea of having a commercial purpose, or having sellable research for industry or businesses. Besides, because most of the research grants are government based, the commercial purpose of privatizing research does not seem to be a part of this department's overall goals.

The last point in economic globalization in the arena of higher education is expressed as the global competition of higher education institutions for monetary gain. There is a competition to get grants. Dr. Phutan explains the competition in his words: "Remember each grant has 10 to 15% acceptance rate. So you can imagine everybody writes half a dozen proposals every year. Even more than that." This shows the competition for grant funds. However, because almost all of the funding for the grants is

U.S. based, the competition is not a global competition for monetary sources. It is a competition for U.S. based grants.

When asked about the economic aspects of globalization, the faculty explains and how the department is influenced by funding.

> **Researcher: Economically, do you think globalization has influenced your department?**

An American professor, Dr. Shelly who has been at this university for 6 years and has come from one of the best universities in the field of computer science answers:

> **Dr. Shelly:** No, I don't think it has [been influenced]. We don't have much money come in from outside the US for two reasons. One is that we are a state university, so it is a little harder for a foreign company to decide to invest in a part of the other country's government. And the other is that we just get a lot of money from NSF or local companies.

Dr. Shelly's research grants are all from domestic sources: two American industry grants and two from the U.S. military. His area of research is artificial intelligence. Another professor, Dr. Mohi, who works on "embedded systems" explains his answer.

> **Dr. Mohi:** In terms of funding I think it's modestly impacted so far. I know some people get grants from outside the US, but I think the vast majority of our funding is still US based.

Dr. Mohi explained later that the companies *he* is getting funding are all U.S. based. He added it would be possible to have international companies funding such research and he has seen it, but it has not happened with him yet.

Dr. Phutan, works on computer architecture, that is, understanding and advancing the design and interconnection of computers for maximum performance. His answer is:

> **Dr. Phutan:** I think the industries that fund us, they are involved internationally for sure. But the offices that fund us are inside USA. I do not know actually if anyone has direct contract from outside the USA. But I know that they all go to many different countries to visit industries outside countries, to visit universities outside countries, discuss research. But mostly we visit research organizations. Not necessarily the sales officials are manufacturer officials.

He has a wider explanation of the global connectivity. He explains the funding organizations are all U.S. based but he has an understanding that these organizations might have international links. He also makes sure I understand that they seek research organizations to make the point that their goal is not to seek buyers or sellers, but to seek research opportunities.

Dr. Calsoyas is working on the area of “database management” and has several grants, all of which are U.S. based. He explains his answer:

> **Dr. Calsoyas:** Not yet. We don’t directly apply for international funds. We group with someone and apply for an NSF grant and sometimes the other country contributes. This is not very common, but it happens.
>
> For example we work with Brazil a lot. We work with professors there and they are paid by their own country.

He does not explain why they don't apply for the international funds but makes it clear that this is not a common practice in this department. The professors that mentioned there might be some small scale collaborations globally also indicated that the impact of them on this department financially is minimal. For example, Dr. Chang explains international funding takes place, but adds that it is rare.

> **Dr. Chang:** Yeah, yeah, for the research of course. In research I think not only me but I know some other colleagues as well; people collaborate with people in other countries for grants, you know…for writing papers, those kind of things. Those are rare, but we do it.

Dr. Strong, whose area is closely related to linear algebra, he works on "program optimization." He explains how it is possible to collaborate internationally for funding:

> **Dr. Strong:** There are very very small grants for cooperation between countries, which means that me and another researcher might apply for a small grant to fund travel between countries I think those have always been there, NSF and other agencies have done those regularly on a small ad hoc basis. I haven't taken advantage of them particularly. When I travel I just go and visit friends. As far as financially almost all of the funding, most of the funding for computer science comes from the NSF, maybe 60% of the funding. It's definitely targeted towards US programs and comes from the United States.

Here, Dr. Strong also makes the point that this practice is not very significant. Another professor, Dr. Mark adds to our understanding of global influences on the department. Dr. Mark's area of research is in the areas of computer networking.

> **Dr. Mark:** As far as funding goes, I mean US is such a big country that even if someone from Korea or India decided they wanted our expertise on something, they undoubtedly have some US presence here some subsidiary that they can use to take their money as a deduction against a US tax bill, we don't get….. Other than self supported visitors or graduate students bringing scholarships from home, and that's really rare, we don't get cash flowing into the country directly from other places very often.

Again, on the subject of funding, Dr. McLean explains the financial impact of globalization:

> **Dr. McLean:** I have a few international grants. There's one I'm applying right now with a guy in England. I had an international grant with a lady in Hong Kong. But for the most part not too much because many other countries aren't as aggressive looking for grants because they don't need them as much. Many people are on salaries all the time. so, the extra money only for students or special things. Whereas, America, not uniquely, but almost uniquely, you're paid nine months out of the year, if you want to make the extra three months summer salary, you have to get grants, we are more aggressive about getting grants in America than people are in the rest of the world.

Here, Dr. Mc Lean explains that the global funding is a small part of the overall funding. What he emphasizes is not really where the funding comes from, but the importance of obtaining funding through grants for the faculty in the U.S. Here, Dr. McLean mentions the collaborations but stresses that they are very few because almost all his funding for research projects come from national entities such as the U.S. Army and NSF. He explains this when I asked about if globalization influences the research topics, then he answers saying “No, but funding does!” When I probe further, he explains: “I mean there are some things I only do because there is money so I might have an idea which is very cool like butterflies but can I make it work for guns, because the army will pay me for guns but not butterflies.”

The general trend in answering the question of ‘globalization in economic terms’ is through the funding the department receives. For example, when I posed the question of “Economically, do you think globalization has influenced your department?” funding is the first thing that comes to their mind illustrating the financial aspects of the department. As far as funding goes, it seems that the department mainly depends on the research grants they get. Although there are some small international collaborations, almost all of the funding is U.S. based; therefore, the faculty does not believe that the department is influenced by globalization economically. They explain the reasons for that as:

1. The university is a public university; therefore it is legitimate to have public funding,
2. There aren’t that many international grants to grab, and

3. There is enough funding from U.S. sources.

To sum up, the economic activities that take place in the department do not seem to be guided by globalization. The answers were quite straightforward as the faculty seemed concerned about the sustenance of the department and not how globalized it was. I had the literature stating how globalization is a process of increasing interdependence and how organizations find ways to react to these interdependencies for the benefit of the institutions (De Wit, 2002; Knight, 2003). My bias from the literature made me look at what is happening in this light. The faculty explained how they need the top students in order to compete in ranking and therefore to attract better students to do better research. The relation to globalization is that the competition is more and more worldwide and the top students could come from anywhere in the world. As far as the funding goes,, there is no seeking funding globally, there is no economic incentive to seek international students, the goal of the department is not set up as having a commercial purpose and the money spent on the students do not seem to leave the country. The increasing international exchange of money does not seem to be a part of this department's overall purpose. There may be some indirect economical consequences of having international students in the department such as expenditures on non-resident students; however, the economic globalization as identified by the literature does not seem to be a part of this department.

Globalization Through the Political Lens

In the literature political globalization is defined as having a neo-liberal economic agenda (private enterprises seeking to maximize the role of the private sector

in determining the political and economic priorities of the state). In higher education, having policies to help colleges and universities pursue commercial opportunity, cross national policy borrowing and international organizations such as UNESCO, EU, World Bank being considered as guiding institutional mechanisms are identified as parts of political globalization.

In order to understand the political side of globalization, I asked questions in terms of expectations, departmental goals and missions and inquired about the existing policies in the department in order to understand if any of the aforementioned defining characteristics are mentioned or emphasized. I asked several questions like “What is the most important part of your job?” “What is the mission for the department?” “What policies would you like to add or change?” “Are there any policies that influence international students?”

When I asked faculty members about the most important part of their jobs, I noticed that they answered mainly in two areas: doing excellent research and guiding and educating students. Some got more excited about the teaching and guiding element, others about the research, but these two were what they saw as the most important parts of their jobs. When they elaborated on those subjects, globalization, global policy formations, or seeking commercial possibility for private sector did not come up in their explanations. Globalization in terms of politics as explained in the literature did not show up in their answers of this question.

I also asked “what is the mission of the department?” trying to detect if there are international elements, policy alignments with international institutions or anything that

could tie the organization to a global mission. In their answers, 'ranking' seemed to be on the top of the list. Two other themes seem to be salient from the answers and that is "money" and "good research." Policy alignments or policy borrowing were not mentioned in terms of the mission of the department. The mission also did not seem to include any neo-liberal agenda such as maximizing the role of the private sector in determining the political and economic priorities of the state. A more detailed analysis of the answers to these questions is covered in the 'Emergent Themes' section later in this dissertation.

To establish a further sense of the political, I tried to identify whether there are any policies geared towards the global connections the department engages in. Literature states political globalization as global processes that are beyond the control of nation-states. In this literature, the role of the state is expressed as key to the expression of social interests and representation of social groups or classes that benefit or suffer from public policy formation (Shaw, 1999; Morrow & Torres, 2000). In this light, I examine the department governance structure to see if there are any specific policies that addressed the international make-up of the people in the department or relating to international connections. As I mentioned before, I sought specific policies directed toward internationalization or addressing global connections. For example, there is a writing course in English to improve the writing skills of students. The participants mentioned that this course was mainly established to aid non-native English speaking students, but it is open to everyone who can benefit. Another policy that had a direct effect on international students is that international students are required to be advanced

to candidacy by the end of their second year in order to be financially compensated in their studies. The reason for that is that at the end of their second year, international students who are advanced to candidacy are eligible to pay resident tuition which is significantly lower than out-of-state tuitions. Because all students are paid for after the second year by the department generated grants, it made financial sense to have such a policy. I also asked if there were any policies the participants would like to add or change in the department. The faculty had no policy suggestions, and the students mostly complained about the time pressure of the policy of being advanced to candidacy in the second year created.

Because the department has a large proportion of international graduate students, I was wondering if there were any policies to recruit certain number or percentage of students from abroad. The faculty indicated that the networking of the professors to locate good students is an informal process and there are no policies to specifically recruit international students. The fact is that they get a lot of international applications and they have a system to pick the best qualified international students by having professors familiar with that country to examine the applications. Because they have a disproportionate number of applications from India and China, they try to limit the number of students from these countries and have an unsaid rule of thumb of 25% Indian, 25% Chinese and Taiwanese, 25% European and other, and 25% domestic. This policy seemed to reflect the way the department responded to globalization.

Identifying political globalization proved to be more complicated than I had anticipated when planning this research. In simple terms, I defined political

globalization to be aligning the policies of an institution towards global goals; and international non governmental organizations as creating guiding principles of these policies. In this department, I have not really identified any large scale political actions in that direction. I have identified some political influences derived from the existence of international students in terms of international student selection policies, special courses to aid international students, and policies to limit time to achieve candidacy. These policies were developed in response to the needs arising from having international students to facilitate departmental goals. The goals in the department mainly emphasized increasing the quality of the department in order to increase the ranking of the department. Maximizing the role of the private sector, or cross-national policy borrowing did not show in the goals or the policies of the department.

Globalization Through the Academic Lens

According to the literature, academia is another platform where globalization takes place. In the reviewed literature, globalization in an academic sense includes international collaborations in areas such as patent building, Research and Development (R&D), and scientific investments. Modern technology, the internet, communication technologies, the flow of students and highly educated scientists in the world facilitate these international collaborations. Specifically in the area of computer science research, as Jenkins has identified (2003), the literature states that the arrival of computer networks and systems, and the challenges they bring cannot be solved without international collaboration such as cultural and language problems in software preparation, overcrowding of the internet or networking systems. The international

collaborations were one of the aspects I paid attention in my investigation of this department's involvement in academic globalization.

I started by asking about international travels and connections abroad in order to get an idea of the global relationships. For example, here is the conversation that went on about international networking. After I explain that my research is in the area of globalization and I am looking at globalization in the computer science department, Dr. Chang and I chat first about his work and then a little about international travels.

Researcher: Do you like to travel in the world?

Dr. Chang: Oh yeah, we have conferences right? We go to conferences.

Researcher: Abroad? Where have you been for these?

Dr. Chang: I've been to many countries in Europe, some countries in Asia, Australia, New Zealand. But haven't been to Africa or South America yet

Researcher: For presenting papers or networking….

Dr. Chang: Mostly to present our research and see what other research in the area takes place.

Researcher: Did you…do you go back to China at all?

Dr. Chang: No no, yes, I have been to spend a sabbatical year in China, in Beijing. I have always been going back to China. I go there a few times a year. Now I still go like 3 or 4 times a year.

Researcher: Usually for work or…

Dr. Chang: Usually for work and also for family reasons.

Researcher: What kind of work?

Dr. Chang: Well, I…I…I have actually visiting position in China as well. So I have some research collaboration. I give seminars, also I help co-supervise some students there.

So I am very very international (chuckle).

Here, after chatting about how he started working in the field, I ask if he likes to travel in the world, and he still has work in his mind, so he answers mentioning conferences which are related to his work field. He uses "we" collectively to mean as a part of the people in the department. Even though he is thinking about work, he does not mention his visiting position until I really probe into it. The conversation is not too smooth. After each answer he pauses and I wait for elaboration, when there is silence more than a few seconds, I start asking questions again.

There is no policy to prevent him from being a visiting professor or to have appointments with a university in another country. Research collaborations are encouraged according to the chair of the department, so I have a hard time understanding why he would not offer this information at the beginning. He wants to mention collective international activities like conferences and presenting papers but he is not too eager to disclose individual global activities. This indicates to me that he is experiencing a discomfort talking about that with me. He does not know me and he does not know how I will present this information, so as a faculty member he does not want to get into personal specifics but answer questions on behalf of the department collectively. He may think his role as a faculty member here or his loyalty to the department might be questioned by someone who does not know the whole context. He

clearly does not hide it; he just does not immediately disclose it. Therefore, his belief that his position's legitimacy might be misinterpreted by someone outside the department could be a factor for the hesitance.

Another professor, Dr. Tasos, my main informant and a personal friend answers questions about international travel and networking:

Researcher: Do you travel internationally?

Dr. Tasos: I travel abroad for personal reasons reasonably often, at least once a year. Either Canada or Greece. For business, sometimes, for conferences.

Researcher: Where in the world have you gone for conferences?

Italy, Hong Kong, Germany, Japan while at (this university). I am trying to remember, I've been to London but it was a combination.

International conferences are important for us to get our name across and present our research.

Researcher: When you go to Greece do you give talks?

Dr. Tasos: Yes once, not all the time.

Researcher: At the university?

Dr. Tasos: Yes actually at the university where I graduated.

Researcher: Do you do it just to give information about education or does the department ask you to go? How does that work?

Dr. Tasos: The department definitely encourages people to go and talk especially for recruitment purposes and it works for me especially to attract

> undergraduate students. At the time that I give the talk actually we had a record number of Greek students accepted, of course this could be an issue of luck but, I want to believe that I got some people excited.

Here, because I know him and I know that he gives talks, I specifically ask about that on the record. Again no offering of information without a prompt exists in this context. There is no elaboration or story telling, choppy answers. Though, he seems proud of the fact that he has successfully recruited students. The department does not pay them to get students or give these talks. The faculty on the graduate student recruitment committees did mention that because it is difficult to assess international students' quality based on just applications, the faculty members' knowledge about a particular part of the world and the educational system is very valuable in the department's assessment in selecting the best students for the program. It seems like a working informal system about international student selection. But again, Dr. Tasos is not volunteering personal information without prompting. He tells me about international conferences being important for "us" meaning the department. He has a collective attitude towards the department he works in. He is a tenured professor and he has mentioned several times how he really enjoys working in this department and with his colleagues.

The department chair Dr. Phutan is from India and he also came to the United States as a PhD student and later became a faculty member at three different U.S. universities, before coming to this university nine yeas ago. He tells me about his travel experiences:

Researcher: Do you travel abroad for personal or professional reasons?

Dr. Phutan: Not a lot but I do travel. I go abroad only in the summer. Sometimes conferences. For example we have a conference in Rio, for things like that.

Researcher: Do you take sabbaticals?

Dr. Phutan: I have not taken sabbatical since I came here, maybe in a year or two I will take.

Researcher: Would you go abroad if you take a sabbatical?

Dr. Phutan: I will go abroad but I probably will go to many different places. I cannot stay in one place for 3 months. Maybe I will go and tour, maybe lecture different universities. And also go and spend time in industry …like Intel for example, we have a lot going on with them. A lot of things like that. I don't know yet.

Pause

His attitude is very nonchalant; he shrugs when he says these.

Again, like Dr, Tasos and Dr. Chang, Dr. Phutan mentions conferences. He does not mention the visiting lectures off hand. I get the information about him lecturing and visiting universities in India from a student that mentions that after Dr. Phutan's lecture at her university which is the university Dr. Phutan graduated from, she has decided to join the program. Therefore, like Dr. Tasos, there is a networking of international connections and ties that exist in the lives of these professors.

Professor Perinski, a Polish origin professor has a more open attitude about talking about his experiences abroad. He actually has completed his PhD in Poland before getting a position as a professor at a very reputable U.S. institution before coming to this university.

Researcher: Do you travel abroad? For what reasons?

Dr. Perinski: Mostly professional. Most summers for one month. I have projects in France, Czech Republic with colleagues. I met them at conferences, we had common research interests.

In 98 I spent a sabbatical at Berkeley, collaborators become friends.

I see my friend in Czech Republic both socially and professionally.

I travel abroad every year. For sabbaticals I go to Berkeley or Liverpool.

Last year I went to Europe in the summer for both vacation and work. Then went to Paris, Poland Germany and Hong Kong. We collaborate on some projects together.

Dr. Perinski does not mention so much about the kinds of projects or if he lectures at other universities abroad, but does tell me that he has the connections. Other professors also mention about him that he "brings visiting professors from abroad, mostly Europe." This information also tells me that he is active in his international relations around the world.

I have also asked the same type of questions of the faculty with American origins, that is, people that were born and raised in United States. They pretty much gave me similar answers, however I noticed that they did not mention that they do

international lecturing or collaborations directly with people overseas. The qualifications of the American professors are also impressive with top ranking universities and numerous publications. However, there clearly is more global networking happening among professors from international backgrounds. Here is a conversation about that with Dr. Lane:

Researcher: Do you travel a lot?... for conferences and stuff?

Dr. Lane: I don't go to a lot of conferences. I've done my share of that.

Researcher: Or for work or lecturing? Do you go abroad?

Dr. Lane: I don't go abroad very much.

Researcher: Do you get sabbaticals?

Dr. Lane: Yes.

Researcher: Do you spend them here?

Dr. Lane: I spend them here, yeah.

Dr. Lane later in the interview, mentions that in his particular field, there is research being done in Europe especially but does not mention if he collaborates with colleagues there directly. Along the same lines, Dr. Shelly mentions the international conferences, and gives a lecture about the importance of conferences in the computer science discipline, but does not specifically mention any international collaborations:

Researcher: Do you travel abroad for your job?

Dr. Shelly: Sure. Is Canada abroad? Ha ha. Well, I go to conferences. Computer science conferences are in most academic disciplines journals are where most research appears. In computer science it is a little different in

that actually the acceptance rates of conferences are lower than journals. If you go to the good conferences, the premier work appears in the conferences. People tend not to read the journals, they read the conference proceedings. So it is true for a few other disciplines for example electrical engineering but computer science is somewhat different than other academics that way. I publish in an economics conference. There is no peer review, there is a bunch of people got together to collaborate, just to chat. But you publish in a computer science conference it is serious. So if my research is going well, in a given year, I'll go to 2 or 3 conferences.

Researcher: Are they mostly in the US?

Dr. Shelly: I'm getting to that. It's changing a bit, 10 years ago, almost all of the top conferences were in the US or occasionally in Canada. Now many of them alternate either North America someplace and either Europe or Eastern Asia. But there are some that are always in the US. So mostly I travel within the US. Last year I went to Europe for a conference. When I say US, obviously I mean US and Canada. Or Mexico or something, but maybe every other year I go abroad for a conference or for academic travel. I travel within the US a lot for other sort of grant functions, going to Washington DC to tell them what we do with the money or ask them for more money. But for international travel I'd say once every other year or so. I could do more, especially if I submitted to other conferences that were there but it costs money out of my grants to do that. Often times I prefer to fund a student for

an extra few months so I try to get my conferences together for common locations.

Even when I prompt him about his particular field and international connections, he does not mention about any international collaborations or going abroad to lecture at other universities or anything that would indicate his global networking between people or institutions in the way the others have mentioned.

Another American professor, Dr. Strong who graduated from a top US university and who has been working at this university for 5 years talks about the international travel experiences:

Researcher: Can you tell me about your professional travel experiences in the world?

Dr. Strong: I travel more internationally now than I used to mostly because once you get established you get invited to more, also because when I was a graduate student main conferences that I would go to were held in the US, so that's still true, but now I option to go to smaller conferences and they are all around.

Researcher: How often do you travel abroad?

Dr. Strong: It varies a lot, I mean in the summer I travel maybe 2 or 3 conferences I guess, during the year it depends on my teaching schedule. The conferences I go to that are abroad are mostly in Europe.

When I take sabbaticals I usually stay and work, don't travel that much

Researcher: Would you go to another country for work?

Dr. Strong: I went to India in 1991 for about 6 weeks, I did that after I got out of graduate school and while I was doing post docs. I did that because I had the opportunity I wanted to visit and sort of half work half just seeing the place. So I like to visit other places and it's just sort of the question of whether it can be done consistent with what I'm doing for work. I visited Europe a fair amount but not so much for work because I have friends there that I know through my work, I would visit them. In my field, there is theoretically computer science that happens outside the United States, but most what happens in the United States. My sub areas, it's only recently that people outside the united states have sort of gotten more interested in so…

Dr. Strong also mentions international travel for work, mainly conferences. He explains that the specific area of research he is interested in takes place mainly in United States. He does not mention any collaborations, visiting lectures or interactions internationally. He does mention a short trip where he worked abroad, but gives the reason for that as getting experience in the field and for personal curiosity; not seeking international collaborations for the purposes of R&D, investments or patent building. In fact, none of the professors mention anything about patent building or investments about their international collaborations.

In the literature, international collaborations provide many advantages including global expansion of research applications such as language or system alignments of software and hardware in computer engineering. Starting from this logic, I asked the participants about their research areas hoping to see if they see globalization as a part of

their research in general. When I asked the faculty about their area of research, they got very excited and gave me long explanations of what they are currently working on. They tried to explain the technical aspects and tried to make me understand how their research is applied in real life situations with examples. None of their initial explanations included comments about the projects having any global perspectives. I probed further by asking "Do you consider the project you are working on global?" or "Is globalization influencing your research?" When I specifically asked this, I got answers like:

> **Dr. Chang:** Well, so basically I collaborate with anyone who's interested in this topic. The nationality or the residence of the person is not an issue.

My question regarding globalization existing in the research arena was very generic. Somehow when I asked if he considers the project global, rather than talking about the project and its effects, Dr. Chang commented on the people performing the research. I tried to understand his point from this remark. It wasn't evident from his answer also who he collaborated with either. When I went to his home page to see his research projects and collaborations, I saw that his projects were all funded by national institutions, and his collaborations were with people who worked in U.S. institutions. The people who collaborated with him on these projects include people from international backgrounds. When I saw this, I understood his comment better. It was hard to comment about the project being a global one depending on the background of the researchers; that was not the point of the research. I believe he understood the term "global project" as one set up for an international purpose or one that specifically

includes international people. That is one way that his comment can be explained in this context.

Another comment from an American professor, Dr. Shelly, also interprets what is a "global" project:

> **Dr. Shelly:** A global project…(pause). Hmmmmm….The math and algorithms are valid anywhere in the world. I don't…It's a little hard to say….
>
> **Researcher: How about applications?**
>
> **Dr. Shelly:** I mean I am not sure what we mean to be a non global project to be honest. What would I work on that would be only valid inside the US? Maybe if I worked on something directly related to something really regional. But no, it is not specifically about globalization but it is not specifically a regional issue. It's as global as any science I guess.

Dr. Shelly defines what is "global" by identifying what is not a global project. He explains it by saying what he believes would not be a global project "a regional one" and answers the question according to this understanding. When he says "it is not specifically about globalization," we see that what I ask "is it a global project?" creates an image of having a specifically global purpose for the project, just like Dr. Chang had. Then he makes the comment of "it is as global as any science, I guess" to explain his answer by a comparison.

There were other professors that questioned the meaning of the question. For example, Dr. Strong, an American professor joked about the question of his research

being global by saying: “Well, I don’t know, my graduate student is from Greece.” He laughed after saying this and continued by saying that his area of research was initially invented by a Russian. He had a joking manner laughing after his comments and trying to gauge my responses before he said anything else. Again, he offered what he thought would be an answer to my question but it was almost like thinking out loud and trying to see himself what it would mean to be “a global project”

Some other professors did not question the meaning of the question. For example, Dr. Tasos, a Greek professor, gave the following answer:

> **Dr. Tasos:** Yeah, I would think it would be reasonably global in the sense that a lot of people in the world would be interested in something like this, or they would be able to do research along the same lines. Actually I know some people from Korea that are very active in studying social networks and a lot of people, so…yeah.

When he comments, he explains his understanding with the words “in the sense that” and continues with the interest in his research subject coming from different places in the world. He also gives an example to illustrate his point. “Global” in his answer is understood as research that promotes interest from people around the world.

Dr. Lane, an American professor also responds affirmatively to the question of his project being “global” in the following way:

> **Dr. Lane:** Oh very much global project. I mean there’s not much work going on in this area in the United States. There’s a little bit and most of it tends to be east of the Mississippi. Not a lot going on in the West Coast. There’s a

little bit at Berkeley, at Cal Tech, but the bulk of it seems to be focused in Europe. The stuff we're looking at now comes from France.

Here, he has specific knowledge where his area of research (mathematical logic in computers) takes place and he comments on where the research takes place. His understanding of a "global project" is the one that takes place in many places in the world.

Dr. Mohi, who works with embedded systems also comments favorably to his project being "global."

Dr. Mohi: The tools that we're developing could be used by anybody and much of the development that's done, the customers of these tools would be in Europe, in Asia, in South America as well as in the US.

The understanding of a "global project" according to Dr. Mohi is the one that the applications could be used anywhere in the world and who would benefit from such research.

In order to further probe the faculty of the area of research and globalization, I asked the faculty if their research topics were influenced by globalization and most of them answered in a way that indicated that globalization was not influencing research topics. Here are some of the answers they gave to my question of "Does globalization influence your research topics?"

Dr. Chang: Mmmmmmm…..Not that much. ….(thinking for a while) No, no not really.

Research area: Bioinformatics

Dr. Wehby: No, not really. Funding does [influences topics].

Research area: Accelerating hardware applications

Dr. Lane: I don't think so.

Research area: Mathematical logic in computer science

Dr. Strong: (Long pause) No, I don't think so.

Research area: Program optimization

There were two professors that indicated otherwise:

Dr. Calsoyas: Yes, I think, because now more people are working around the world in the field and we have interesting research all over the world. There are more possibilities, databases and structural parts.

Research area: Networking

Dr. Mohi: It has helped in my case because Europe is the leader from a research perspective in embedded systems which is where I'm really working. There's very strong governmental support in research in this area and there's a number of companies out there that do embedded systems research: Phillips, BMW, Siemens, SGS Thompson..number of these large companies. So it has catalyzed the field.

Research area: Embedded systems

The topic choice is not really an identifying question of their understanding of globalization, but it creates a bigger picture of the influences of globalization the faculty thinks exist in their world. Most professors dismissed the idea of globalization having to do with topic choice. This made me think about how they perceive globalization.

Because it is such a general concept, I thought the simple answer would be “yes” not “no.” Although globalization is given in the literature and by the faculty definitions as a phenomenon that is “like the weather” thinking that it is not globalization, but other forces (faculty autonomy, funding, grant areas) shows that globalization is not really something that people give much thought in the department. It is not a concept that people consciously consider and discuss and give decisions accordingly in the department.

Academic Globalization According to the Students

I also wanted to see the students’ point of views in academic globalization by inquiring about their area of their research and whether or not they consider it global. When I asked the same question of “What are you working on right now?” The students told me about the research area they are working on, just like the professors, but made references internationally such as mentioning how popular that is in their country or how useful it is in the world without any prompting. I did not ask them the follow up question of “Do you consider your project global?” because they have already made references when they talked about their projects. Although very brief, the students made reference to global popularity of their fields or their applications.

> **Demetrius:** Networking, internet security. Very valid fields all over the world right now.
>
> **Wei:** I am doing networking measurements routing. My MS had different kind of networking, optical networking. I heard about this research when I was in China.

Yueh: Artificial intelligence. It is pretty universal applications wise. But for me specifically, machinery methods, rules and applications. I classify and cluster datasets on network intrusion detection.

Sofia: Social networking. It is relevant to your research [globalization] too.

Esra: Wireless networks. Communications, theoretical electrical engineering oriented, on the hardware level. I would like to do more application work, to use in daily life. It is exhilarating to see you found something that might be useful in the world.

The international connections or applicability of the research was a part of the answer the students offered. I did not have to probe to see if they considered it through a global perspective. They seemed to be proud of their area of research and briefly mentioned the worldwide usage or applications already. They did not elaborate and because the details of their research were very technical, I didn't explore further.

Along the same lines, I asked the students if they think globalization is influencing their studies. I had already asked about their research area, so I didn't ask more about that. I asked a more general question to see if or how they made a connection with globalization to the academics in their world. This time, most students answered positively with elaborations and examples of in what ways it is possible. Here are some of the answers for that question:

Researcher: Is globalization influencing your studies?

Adam: Computers are now all over the world with the internet and stuff. Collaboration between computer scientists is particularly good because a lot of it involves working with software so it's easier now.

What he is working on right now: Computer vision. (Trying to get a computer to understand images).

Adam is pointing out a position that was mentioned in the literature and that is the adaptability of software and how international collaborations facilitate the usage. Earlier he had mentioned his research area's global applications "it [computers recognizing images] doesn't really work but (laughs) it has worldwide applications, don't you think? **How so?** Well, it could be in terms of security like catching international terrorists, or somethings like that." Another student makes a similar point:

Johnny: Yeah, I think so. You can see a lot of products, software used by everyone in the world like Google or acrobat reader.

What he is working on right now: Hepa type inference (decoding DNA sequences)

Here, Johnny gives specific examples of software to indicate worldwide usage. Earlier, he also indicated his area of research being popular in places other than the U.S. Belgin, has a more general approach to the question of the influences of globalization to her studies:

Belgin: I guess it is. How can it not? Technology is influencing the whole world, this is a part of it.

Belgin is a first year student and she doesn't have a specific area that she works on yet. Therefore, she explains her answer in a hypothetical way instead of specific examples like the others.

Saachi has a different perspective of the influences of globalization to her studies:

> **Saachi:** Yes because now globalization is in place I see people bring in their methods of solving problems. When we have a task, it's good to see other ways of approaching it, usually culture plays a role too, how you see and identify issues.
>
> What she is working on right now: security issues in wireless networks (locating threats, identifying and stopping attacks)

Saachi is mentioning another aspect of globalization than worldwide applicability of research. She is talking about how different people from different cultures approach problems in a different way. This point falls in the category of the influences of international collaborations on research.

Esra looks at globalization's influence yet in another way:

> **Esra:** It is, because now I can be a student here but I can intern anywhere in the world.
>
> What she is working on right now: Wireless networks.

Here, she interprets the effects of globalization in terms of liberation; her academics providing her the opportunities to spread out into the world.

Phillip explains the influence of globalization in the following way:

Phillip: C.S. is influenced a lot, mostly because of market. More problems to solve, distributive in nature. Different countries add different components to the science. Globalization makes CS more interesting and adds more variety makes it more needed.

What he is working on right now: Distributive wm (web methods) processing, wireless networks.

Phillip has his area of his research in mind when he answers this question and adds that globalization makes [the computer science research] more needed because of the market. Demetrius adds to this argument in these words:

Demetrius: Computer Science has to do a lot with globalization. Just look at the internet, it is easier to communicate, directly or indirectly products help."

What he is working on right now: Networking, internet security

Here, Demetrius explains that the internet, with its role as providing ease of communication adds to the influences of globalization. When he talks about "products," he means that the products of computer science discipline.

The ways the students related their studies with globalization were by the areas of technology being prevalent all over the world, the mobility of students and scientists, globalization adding variety and different ways of solving research problems. When I asked about their research area, they also gave information about the applicability of their research in the world as an example of globalization.

Another aspect of globalization in the academics is the changing face of higher education. Higher education institutions not only have international scholars and

students in a fixed location, but as Armstrong (2007) states, having programs and satellite campuses all over the world give institutions global advantages in reaching their goals. Apart from certain individual research collaborations, this department does not have special programs or satellite campuses set in any other location. The feature of expanding the institution abroad does not seem to be a part of this department.

Apart from the collaborations and worldwide expansion of institutions, researchers have indicated that the flow of scholars and students worldwide is a part of the academic face of globalization. Altbach & Knight (2007) and Armstrong (2007) stressed that traditionally, this is the way global activities in the academics took place. This is the oldest way that the academics and scientific knowledge spread throughout the world. This department, with its high number of faculty and students with international origins, display this characteristic of academic globalization.

In sum, there are certain aspects of academic globalization found in the department. International collaborations between scholars take place in conducting research projects. The international financial collaborations were very rare and not a significant portion of funding for research. In addition, a large scale department level, or institutional level collaborations worldwide were not noted. The relationships take place through faculty members individually and depend on research areas.

Students, more than the faculty, gave examples of worldwide adaptability. From the way the faculty answer the questions about academic arena of globalization, I conclude that they don't really think of their research in relation to globalization specifically. Globalization is not something that is a part of their reflection on what they

do. That is, globalization is not in their conscious thinking when they consider their research.

Students and faculty differed in their approach to globalization. Although there are global connections and collaborations and sharing of information and research, the faculty did not immediately report them and played down when mentioning them. I also noticed that some of the professors who had international connections and collaborations did not mention about these connections, which indicated to me that the *international nature* of their connections were not the point they wanted to make. In the literature, one of the fundamental arguments for internationalization comes from these international connections and what people do with them. The research indicates that international students who finish their studies in the U.S. often become part of networks in the U.S. or their home countries adding to the global knowledge as well as forming collaborations which bring diverse minds together. As a result, the research and development especially in scientific fields experience enormous advancements and many solutions to problems (Griffiths, Agnew, Armstrong, Freeman, Gast, Moses, Neureiter, Paul, Preston, Reichmanis, Richardson, Siegel, Stephan, Teitelbaum & Wake, 2005). Therefore, for the field of computer science this is a valued component and the faculty, knowing the benefits, exercises it. The reason they were not emphasizing it was because they were concerned about the outcome of the studies and publications more so than the international nature of the collaborations in achieving them.

From the activities of faculty, I can conclude that they are making use of globalization in order to reach institutional goals and therefore internationalizing the

department, but this is not advertised or emphasized or brought into the foreground. This means that internationalization is not the cause of their actions but a tool to achieve their goals. Also, it is not the only influence on the department. There are more influences on the institution other than the international components. Institutions are a part of many influential forces. Where the money comes from (mostly U.S. government), political environment (equal opportunity seeking for minority members of the community), the overall public opinion about internationalization (projected through the media) all influence the way decisions are portrayed.

For the students, relating globalization to their studies was easy and legitimate. Globalization is seen as a liberating force that enables them to expand into the world "I can be a student here but I can intern anywhere in the world." This freedom of expansion is seen as globalization. There was a comfort and ownership when talking about globalization and its effects. It was as if their actions dictated the phenomenon called globalization rather than something beyond their control. They too make use of their international options in achieving their goals by internationalizing.

I also noticed that faculty members with international backgrounds have more international connections than their domestic colleagues. Although computer science is a highly international field, the majority of research still takes place in the United States. In addition, most of the prominent institutions and conferences also are housed in the U.S. The American faculty might find fewer opportunities or benefits in lecturing abroad or seeking international collaborations because of this fact. The American faculty does keep in touch and collaborate with the institutions in which they have

studied earlier. For the faculty with the international background, they also keep in touch with the institutions they studied before coming to the U.S. and because of the international nature of their background, the interactions are global.

Globalization Through the Social/Cultural Lens

Social interactions and cultural values differ according to what group one identifies with. Any individual may have multiple group associations and these may be in conflict with each other. The literature suggests, globalization has created a new social environment (Kellner, 2002). This social environment has been described in terms of "the widening, deepening and speeding up of world-wide interconnectedness in all aspects of contemporary social life" (Held et al., 1999, p. 2). I tried to observe and analyze how aware people are of globalization in their social interactions and how important it is in their lives. It was very difficult to examine such an aspect because personal relations vary not only according to culture and nationality but interpersonal compatibility as well. The criteria explained in the literature included globalization bringing people who share certain beliefs, professions or causes together such as computer scientists, Turkish music lovers or Holocaust survivors forming new forms of societies. At the same time, as the national communities get more pluralized, cultural and economic differences can form divisions among the people who share the same locality (Cevre, 1995; Hannerz, 2004).

In order to shed light on the social and cultural make-up of the department, I asked the general question: " There are many international people in your department, how does that influence your department socially?"

Before asking this direct question, I inquired about social relationships in the department indirectly by asking about get-togethers, who they hang out with, what activities bring them together socially, in order to get a feel for the social side of the department. Some of the questions I asked were: “How would you describe the culture or the climate of the department?” “What do you like to do in your free time?” “What social activities do you like to participate in?” “Are there any social groups and get-togethers you prefer to attend?” “How is the communication in the department?”

The answers were unanimously very positive. From the answers the participants gave, I had the feeling that this is the friendliest department I ever came into contact with. The faculty kept using the words “collegiate,” “supportive,” “integrated,” “friendly” to describe their department culture. The students also had the same notion and used words like “very friendly and helpful,” “no competition,” “relaxed atmosphere,” and “fun”

Both the faculty and the students mentioned that there is some clustering of the people especially students among the ones from the same geographical area of origin. For example, the faculty members mentioned:

> **Dr. Shelly:**…if you look at faculty members, they tend to have graduate students from the same nationality, a gross generalization of course. If I were from Germany (I am not), you would expect to find more graduate students in my group who were German and spoke German. You know I’m probably known in Germany more and so there are probably students back there who their advisors know me so they refer me, to apply to this university or to this guy.

Mr. Smith: There are kind of jokes that sometimes kind of go around like "The Greek Mafia" kind of jokes you know (starts laughing) , they are all just jokes I mean there…from everything I can see they all get along really great, I mean really some of them tend to maybe have a little closer friendship maybe they come from the same country whatever but, I don't see that being in any negative aspect at all to that. These guys seem to get along really well from what I can see even outside of their background.

Dr. Chang: For faculty I think, faculty collaborate with each other, mostly by their research interests. However, the graduate students, I do see some kind of clustering, by their nationality. I think mostly because of the language. Language barrier. So the Chinese tend to work more probably study more together with Chinese. And the Indians as well, and Greek students as well.

Some students mentioned this as well:

Johnny: The students have groups among them. The problem in my lab is that most people are Chinese. I speak Chinese, it is easier. We had a visiting student from italy and a first year student from Iran, when they are in the lab, the Chinese students still speak Chinese among themselves discussing work. That's not appropriate.

Belgin: Between students, there's of course regions like Asians and Europeans, but there are exceptions. I see Americans and Asians the most separate in their own groups, the rest kind of mix more."

Esra: Among students, there is a little division. I managed to penetrate Indians. If you have a majority from your home country you hang out together.

I noticed Chinese don't really hang out with non Chinese.

Murat: Among students, the communication is good. Only Chinese students separate themselves. Because, I heard from Chinese guys that there is no chance for failure. They support each other about anything. The conditions in China are tough so they want to stay and they work very hard to stay.

Although the people mentioned some clustering on the lines of language and nationalities when they are at school, when I asked about their social activities, I could see more integration along the lines of interests. For example, people interested in hiking had trips together, people who like dancing or certain sports hung out together. Both faculty and students also mentioned some of the benefits of this exposure in terms of getting to know other cultures.

Dr. Phutan: I think cultural interactions are very integrated. For example I visited China in June. Just through the research, I know a lot of people, where I was going they know me, I know some of them, you know. So it was a great interaction not only for research but also socially.

Dr. Calsoyas: At this level, the people in the department are colleagues, they might have different ways of approaching a problem but it may be from many things, where they went to school, who influenced them, their personality or culture too. It is stimulating to have this."

The students mentioned the cultural integration as well.

Tim: They say Greeks and Turks are enemies, but they always hang out together and party

Yueh: I have friends from many different nationalities, I never had that before.

Belgin: …I was very conservative, didn't know much about the world before I came. Now I see so many common things between many nationalities. You only hear about the differences when you don't come in contact, that's why prejudices occur. I think I managed to self develop and now, I can live anywhere in the world and make friends.

Saachi: I have American boyfriend, I never thought I could do that before…

Esra: My boyfriend is Greek, you know, it was really hard to convince my family to accept that, but people are people, I lived that here.

Wei: Among students, new students in same year keep good communication, submit papers, tax paperwork. Most friends are from lab.

The benefits they mention seem to happen because of the exposure to each other in a place where they have a common goal and activities, a sort of international integration as Chomsky has pointed out (2006).

In summary, the social and cultural aspects of globalization seem to take place throughout the department. People find out about each others cultures just by integration of people in the same location and having common goals such as their academic fields. This cultural integration is not the purpose of the department; that is,

they do not choose people for the department for the purpose of integrating people from different cultures. This happens organically because of the integration.

Emergent Themes

Several themes emerged from analysis of the data in the four of the issues that were mentioned frequently and are important to the respondents. The themes that emerged are a) ranking, b) research and funding, c) lack of American students, and d) student quality. These themes transcend the individual differences and represent the overarching views of the participants in the study. In the themes, it is possible to see the department's involvement in globalization; even when the participants are not explicitly talking about globalization. In developing these themes, certain attitudes and viewpoints differ between the faculty and the students. The faculty played down global dimensions, but the students were proud to express them.

Ranking

Ranking of this Computer Science department in relation to other departments around the country was among the most important issues for the department in general. When I analyzed the website and the brochures for the department, I saw that ranking was the most frequently mentioned item. In addition, both the faculty and the graduate students gave ranking as the most important goal or mission of the department.

The website of the university in which the department is located has dedicated a whole section on ranking. As a first window on the department, the department's website, is like a sales pitch. It is what most prospective students would see. The

website emphasizes that the department's national ranking went up 12 points. Ranking reflects the competitive nature of higher education institutions.

One of the important news about ranking of the department was that the Computer Science Department of the university has jumped from 65th best graduate program to 53rd. This increase is advertised and proudly displayed at the main webpage of the department with a link to the complete ranking of computer science departments in the US news website. This ranking is a national ranking of all US graduate schools' computer science departments and the criteria include the number of students graduating with PhDs and the research grants the department receives in a year. Faculty also mentioned that in ranking, top 50 is a magic number because usually it is the top 50 departments that are mentioned in the news and media most; therefore, going up in the scale to get close to that is a great success for the department.

When I was investigating the political aspect of globalization in the department; I asked about the mission of the department to the participants. For both the faculty and the students, 'ranking' seemed to be the top issue they talked about. Here are some of the examples from the data:

> **Researcher: What is the most important mission for your department?**
>
> **Dr. Shelly:** Sure our current mission I think is to put ourselves let's say in the top 25 or 30 departments in the world in computer science. Now the hard part about that is somebody has to leave the top 20 or 30 (chuckles) and most places aren't getting worse. With some exceptions of course but most places aren't getting worse.

Here, Dr. Shelly gives ranking as the mission of the department and adds that it is not very easy to go up the ranking. He points out that in order to move up, this department has to get better than those on top in the world which indicates the playing field of the department is global.

Dr. Mclean approaches the issue of ranking in a similar way:

> **Dr. McLean:** one goal is kind of there's a magic number which is the ranking of the department. And you know for various reasons everyone wants the rank to move up, so one goal simply is the ranking right… But that's the indirect goal. The direct goal is to get better. Cause if you get better, hopefully the rank will go up right.

Dr. Mc Lean is also indicating that the department should get better to move up the ranking. The department chair, Dr. Phutan also without hesitation gives ranking as the most important mission of the department:

> **Dr. Phutan:** The most important mission is to go up in the ladder, to be recognized by others and ranking. That is what every department tries.

Dr. Phutan explains that ranking is something that is valued by 'every' department. He is giving the mission and tying institutional isomorphism in his answer. Dr. Tasos' view is also in terms of ranking.

> **Dr. Tasos:** OK. The mission of the department is to rise in the rankings according to the public belief of how good the specific department is.

Dr. Tasos adds that ranking determines in the public view how good a department is.

When I inquire about ‘how’ a ranking can go up, the professors mention that getting grants help to support more graduate students; and getting top notch students help produce good quality research; and good quality research help produce good publications; and good quality publications make a department more visible and go higher in the ranking.

> **Dr. Shelly:** If you have to rank the departments every year, see the changes. It requires a significant mass of faculty bringing enough money to get enough graduate students to do research. And to produce enough publications to be noticed. They’re all tied together.
>
> **Dr. Mc Lean:** One [way] is to get more money which actually helps. One is to get papers published which also helps. To have as many PhDs as possible to graduate, which also helps.
>
> **Dr. Phutan:** By getting recognizable research and more money for it
>
> **Dr. Tasos:** And that’s [how good the department is] definitely something that fundamentally contributed with what is your research and the money you bring to the department. Money here is secondary but if you have a lot of money you can afford to do a lot of things, you can hire students, you can do stuff that would also bring you a lot of visibility.

Other professors also mentioned all these factors of good research, visibility, good students as a part of getting better in ranking. I also asked how rankings are determined and whose ranking the department values. Dr. Tasos explains:

Researcher: What kind of ranking, when you talk about ranking. Is there a specific..?

Dr. Tasos: Yes. There are a couple. Typically most people use is the one from US News. It gets very tricky because the ranking of the Engineering College overall, there is the ranking of individual departments. Sometimes a department does not fit exactly in one categorization, or if it expands in more areas. Then of course, when you compare a small department let's say a department of 20 people with a department of 80 people, the comparisons are very…interesting. Right now we are probably ranked around top 60 departments, 60 something.

Researcher: How many departments are ranked total?

Dr. Tasos: The ones that are ranked in this ranking is probably close to 120. But the number of departments that exist would be in the 500s or more.
Ok this ranking considers universities that are only research oriented, not the teaching schools.

Researcher: So do you think globalization influences this mission? Of ranking?

Dr. Tasos: Actually there is an interesting connection with globalization and ranking in that we want to attract international students at the graduate level. The students from abroad are primarily using the officially published ranking catalog to identify which are the good schools they want to go. And obviously these rankings do not take into consideration the most recent and

exciting developments in the department so new departments are sort of handicapped because of that. Because the belief of the system is long, people do not change an opinion quickly. So there is definitely an effort for…one of the reason we want to go up in the ranking is that so we can attract better students

If you say if there is no globalization, if the students were local, would it be easier to convince them that our school is better than the ranking? Would have less voice at that point, but yeah.

Dr. Tasos gives more insight into the ranking procedure. He explains that some things such as the size of the department is not taken into consideration in ranking and that could be a disadvantage. He also adds that the ranking is used to attract good students worldwide to the department (which in turn helps the ranking). Dr. Lane adds what factors determine the ranking:

Researcher: How do they determine that? I mean the ranking, do you know?

Dr. Lane: There are various agencies and it has to do with the number of publications, and how prominent the publications are, it'll have to do with the amount of money that's coming in in terms of grants, the number of PhDs we're putting out.

Researcher: So the more PhDs you graduate, the better your rank?

Dr. Lane: Yeah. But it's also where they get jobs.

Researcher: Do you keep track of where they get jobs?

Dr. Lane: Yes.

Dr. Chang also adds to the subject of how ranking is determined and which institution's rankings are valued.

Researcher: How is the ranking decided?

Dr. Chang: There's a US News and World Report all different rankings. They go by all kinds of statistics. But I think for US News, the peer ranking, basically the visibility, the impression that people have on UCR, on Computer Science Department place a very important factor and our history is very short. So in terms of visibility probably not everyone knows us so well yet. So we definitely, in the rankings we are not ranked very high at this point.

Researcher: Do they rank these every year?

Dr. Chang: US News actually goes every year or…once every two years. There's probably a more important ranking that has not come out yet. That's the National Research Council ranking, they do it like once in every 10 years, it is not very updated but, that one is taken more seriously by people in academia.

I asked the students about the mission of the department as well, and they also talked about the importance of ranking and reputation as well as having good students and good research.

Murat (2nd year student): They're trying to go higher in rankings. Publishing good papers and try to get good reputation. There are weekly

talks by professors or companies like Google, Microsoft. Department invites these people to show how the students are.

James (2nd year student): Getting more name recognition. Recruit talented students, get better publishing record.

Esra (5th year student): They want graduate students that can think independently. It is a small department developing very fast. They want reputation like the other UCs; want to make a name for them.

Adam (5th year student): I guess just keep trying to build up more reputation, establish themselves more.

Phillip (4th year student): From what I understand, good reputation and research money comes second. They prefer students to go for 5 years PhD, not leave with masters but they don't force to stay. Very few students leave anyway.

The students seem to be aware of the importance of ranking and reputation. Another thing that I noticed is that although the question was the same "What is the most important mission for your department?" The all the students answered the question by referring to the department as "they." In contrast, the faculty used the pronoun "we" to refer to the department. The reason for that could be that for the students, the department is a temporary place to get their education, but for the faculty, it is their work place.

With the complex structure of legitimacy, an organization is not likely to be in a position to meet the expectations of all actual and potential stakeholders who may grant

or deny external legitimacy. The departmental ranking vows closest to satisfying everyone in this case. The ranking is important for all constituent groups in the department. It attracts the students seeking quality, advertises how well the organization is doing to attract more work and improves the reputation in the university system. Therefore, the ranking is a value that increases the legitimacy of the department.

Globalization is closely related to ranking and reputation of the department. Although not immediately and explicitly stressed, globalization has changed the playing field of the department in terms of ranking. The department is ranked among the computer science departments in the world. The better reputation the department gets from higher rankings, the better students they will attract in a worldwide pool to do better research that would be recognized globally. The mission of the department is not globalization; however globalization influences the department in order for them to reach their mission. In other words, globalization is not something they are trying to do, but it is happening to them nevertheless.

Research and Funding

Research and providing funding for the research is also a theme that emerged as important for the department. The professors seek grants to fund the students they have. There is a vigorous search to find grants for research in the department. Throughout the interviews, research and finding the funds to conduct the research were mentioned as the most important issues to sustain the department.

In order to get a sense of the department and the work they do, I asked the faculty members what they think is the most important part of their jobs. Here are some of the answers the faculty gave:

Researcher: What is the most important part of your job?

Dr. Mc Lean: Unfortunately to a larger extent it's getting money. When you're a professor you have to get money to be successful. Because money lets you hire students, draft papers to travel to places, to give your information out to buy computers to buy equipment, so if you don't get any money in the sciences, you don't have a good career. I mean you have no career.

In history you don't get money and you could still be a professor right, but in sciences, you have to get money and if you can't nothing else matters unfortunately. So getting money is a big part of my life, I spend half my life getting money.

Dr. Mc Lean explains what makes his job possible and how important it is to find funds in order to be considered successful in his job. He adds "unfortunately" which indicates that he is not thrilled that this is the most important issue, but continues to make his point that this is the way it is mostly in sciences. Dr. Shelly explains his view:

Dr. Shelly: the most important part of my job is number and quality of publications that I produce. And to a lesser extent, the quantity of money I bring in, and the amount of graduate students I support. In computer science

most of our money goes on supporting students, we don't have large equipment costs.

Researcher: So how much you bring in determines how many students you will have?

Dr. Shelly: Yeah, how many students I can support in my group, how many trips I can take and the occasional equipment too. So the number of students in my group is pretty much limited. Well, ok, there is an upward bound that I hit last year and I don't want to go over that just because of my time. But where you struggle is if you have 2 students getting the third means I just need more funding.

Dr. Shelley explains the most important part of his job as the publications based on research that he produces in the department. Then he adds the importance of the money he gets to perform the research that leads to the publications. He doesn't tell me that funding is everything, from his answer I can conclude that it is an important issue for him to talk about and explain. The chair of the department, Dr. Phutan explains the importance of his job in terms of funding as well:

Dr. Phutan: The most important part of the job is try to get research grants, to be able to fund students. I think everybody in the department spends most of their time in writing grant proposals. Which probably doesn't happen in Europe, it is different ha ha ha.

Researcher: How many do you do on average?

Dr. Phutan: You know to have 4-5 students, you have to do 2-3 grants. Remember each grant has 10 to 15% acceptance rate. So you can imagine everybody writes half a dozen proposals every year. Even more than that.

Dr. Phutan explains that finding funding for research is unique to American higher education by comparing to Europe. He also quantifies the amount in order to show me how hard it is to try to get funding. Dr. Tasos also mentions the importance of research and funding and emphasizes research:

Dr. Tasos: The important here is a very tricky word.

Researcher: What do you value most, your favorite?

Dr. Tasos: Actually I like several aspects of the work. Teaching is a lot of fun. But teaching does not really get you credits in terms of professional stardom. What gets you professional visibility and credibility is research and papers and grants. And of course from the point of view of the department, the most important is research, as long as you do reasonably well, people are OK are not revolting, in some cases people may say that money is the most important thing for the department, as long as you bring a lot of money, the department is very happy, but also our department also is very keen on purely intellectual contributions. Even if someone doesn't bring a lot of money, but sort of does astonishing and breakthrough research, that would be appreciated by the department.

He things "important" is not so clear so I explain it by asking what he values most in his job. He clearly likes teaching, he actually has received the best teacher award for the

department several times. However, he also points out what he likes is not the most important part of his job. I understand the most important part of his job he thinks valued by the department is the research and the grants he gets from the research. He makes a distinction between what he values and what the department values and this makes me separate the question into these two components while asking to the remaining participants in order to understand the department and its people better.

> **Researcher:** What is the most important part of your job? (I pause to allow the interviewee time to collect thoughts and answer, but because of the last interview and also if I detect a slight puzzlement in the interviewee's facial expressions, I elaborate) You can answer in two ways if you like, what is most important to you and what do you think is the most important for the department?
>
> **Dr. Strong:** …I do it because I enjoy it mostly. And if I didn't enjoy it I'd probably do something else. The thing most important to me is working on the problems and writing papers and things like that because I enjoy that. Part of that is working with people because it's a lot more fun to work with other people. Now that's my motivation….
>
> …People are always in academics these days have to justify what they do. So when you apply for a grant or when you give a job talk, and I think the stories people tell are more like sales pitches than the truth. I can give you that (the sales pitch). The sales pitch is that the basic research is basic research, and basic research is studying mathematical structures that come

> up in lots and lots of applications and so you have the opportunity to understand something with many consequences that you don't really foresee. We are in a college of engineering and I think the people are really more concerned about applications, engineering is more concerned about applications and here in particular because of our budget situation which is always going to be the case because we are concerned about grant money, we are concerned about improving our reputation by a very specific metrims like where do we appear in the rankings.. I consider those things to be a little short sighted but I understand why they are concerned.

I get good insights about what Dr. Strong thinks is the most important part of his job by separating the question. He explains that he enjoys the research, but also he talks about selling the research which is in order to get grants and improve the ranking. His area of research is program optimization which is kind of linear algebra except with systems of inequalities within set of equalities, it is considered basic research without paying attention to applications. He really enjoys doing this type of research but mentions that one of the priorities that come being in a college of engineering is the applications of research which he is not concerned much. However, when I present the question in two forms to Dr. Ionescu, he combines his answer:

> **Dr. Ionescu:** Well the goals are better be aligned. I won't have a very easy life here. I think what I care about most is two things, doing top notch research and doing high quality or top notch teaching as well. I think this is very much aligned with the goals of my department.

When the interview was conducted, Dr. Ionescu had been at the department a little over a year. Because he is new to the department, he talks in terms of the future after he mentions the alignment of his goals and those of his department. He too is concerned about doing excellent research. He adds to this notion when I ask about the mission of the department:

> **Dr. Ionescu:** Trying to essentially achieve a higher rate of student retention or student preparation when they graduate. And also on the research front, you can measure this objectively by trying to encouraging faculty to pursue ambitious research projects, encouraging them to publish in publish in top conferences and top journals, and seek for very competitive grants from prestigious organizations like NSF or DARP or DOD. Nothing speaks better than being able to secure funds and to publish…Secure funds from prestigious agencies and to publish in top venues.

His last remarks summarize the goals of the department which are in terms of publishing research and finding funding that produces the research.

When I asked explicitly if globalization influenced the research topics, the faculty for the most part answered negatively. Globalization was not something that the faculty had in mind when discussing research and its topics. However, they did mention that funding has a lot to do with research rather than globalization.

> **Researcher: Does globalization influence your research topics?**
>
> **Dr. Wehby:** No, not really. Funding does.

Along the same lines, Dr. McLean gives insights about funding and research topics:

Dr. McLean: there are some things I only do because there is money so I might have an idea which is very cool like butterflies but can I make it work for guns, because the army will pay me for guns but not butterflies. So it does change every so a little bit, but I've been very very lucky that I've mostly been able to avoid that. I've been mostly been able to get some money for things I thought I really want to do, but unfortunately it does change what you do.

Here, we can see that what is on the minds of the people in the department is not so much globalization, but their immediate needs and problems. The faculty makes the point that they are not trying to pick topics for their research for globalization. But the funding, on the other hand, is an issue that has immediate consequences for the department and needs to be taken into consideration.

When asked about the mission of the department, Mr. Smith, who is a lecturer gives his side of the understanding of what is important for the department:

Mr. Smith: I have been going to the retreats for the last couple of years and that's all people talk about.

Researcher: What?

Mr. Smith: How can we make more money? Ha ha ha (laughs). How can we make more money, and of course reputation is all about "how can we increase our reputation so we can make more money" Ha ha ha (he cracks himself up at this point). So I sit there at these meetings and I am not really directly involved in all of that, well most of it. There are parts of it that I am

> directly involved but I end up sitting there all day and going “wow it is just all about money”, that is what it seems from my perspective you know. Everything they do, it all comes down to “how is this going to make us more money?” You know track better students, get us a higher reputation, that will bring us more money Ha ha ha (laughs). So that we can get more students to make us more money ha ha.

Funding seems to be on the people’s minds a lot and it is one of the factors that makes the department successful. The department’s success is measured by ranking and the ranking is determined by the prominent research and publications, and the graduate student success. The cycle of funding, research and students that Mr. Smith is talking about is a very important aspect of the department. Where the funding is used is a big factor in determining the success of the department. Because this is an academic institution and requires students to exist, the funding of the students become an important issue.

Student Funding

When trying to understand the financial aspects of the department, I tried to understand the economic impact of the international students on the department. I asked all the student participants about financing of their education and the impact it had on their decision to come to this department. All of the students knew that their education would be financed by the university. They indicated that this information was included in the acceptance letter they receive. They were aware that the first two years they got a fellowship that covered tuition and a stipend for living expense; and after, they are

funded by their advisors with the research grants. They also work as Teaching Assistants or Research Assistants. The coverage is the same for domestic students as well as the international students. However, because international students' tuition is higher than the domestic students', it costs the university more to educate international students for the first two years of their education. International students are considered non-resident and pay more than twice the amount California residents pay ($9270 for non-resident quarterly tuition, $4236 resident tuition). There are 120 PhD students in the Computer Science Department at this university and 85 of them are international.

Being funded is one of the most important issues for the students to come here. I asked to the students if they would still come here if they were not funded and most of them said they wouldn't.

Researcher: How do you pay for your education? …Did you know this before coming here?

Johnny: First two years I got 1/2 fellowship, 1/2 TA. Now through GSR, my advisor supports me.

I knew when I applied about this. In the application there was a question asking if they didn't support me, would I still take the offer. I answered no. I need the support.

Belgin: I have fellowship for 2 years and then my advisor will support me. I knew this before coming, it was a big part of my decision.

Barry: Dean fellowships is 2 years, then find your own research and the research grants pay your education. IGERT or google, it is the advisor's job

to find the research money. It is always what is best for students. He (my advisor) has me look for it but ultimately it is him.

It is a change coming from working. Usually 1st year is covered, full tuition paid, 1700 stipend/month, nothing for summer. 2nd year 50% so you have to do TAship, or if your advisor has it, he can cover and you don't have to TA.

Esra: I knew about the fellowship and the TA opportunities and it was also in the acceptance letter. It was a big factor, I couldn't have come if it didn't exist.

Sofia: This year I have fellowship. After, I will be TA. It used to be 1st year 1/2 fellowship, 1/2 TA but it is better this way.

I knew from the beginning about the fellowship, they put it in the acceptance letter. But first, to get the I-20, you have to show you have enough money, then fellowship is offered. It was not easy.

Wei: 1st year fellowship, then I have to TA or advisor pays. They wrote it in the acceptance offer. It was a good deal, helped me decide, yes.

Demetrius: 1st 2 year fellowship. Then grants and NSF grants. I knew for sure I would be supported, I didn't know the details much. Other universities like North Carolina offered 1/2 TA and 1/2 fellowship, this deal is better.

Murat: We have fellowship for 2 years, tuition plus stipend. It was in the offer letter. Other universities didn't offer.

Yes, It made a difference, but my family was ready to pay if I needed that.

Saachi: I have fellowship for 2 years. I also had to TA, when I TA tuition is waived. After 2 years advisor supports with research grants. It was a big factor for me, if I didn't know this I wouldn't have come here.

In terms of the students' education goals of coming to this university, it seems like funding played a big role. These students are at least qualified enough to study in this department and they come from all over the world. It looks like the department tries to stay ahead of the competition by offering financial incentives to students who might otherwise accept offers from similarly ranked universities. Dr. Calsoyas mentions this in student selection:

Dr. Calsoyas: We try to give higher stipends and that way compete with good schools. We give 2 years of fellowships, some schools give only 1.

The goal here is to get the best students they can possibly get. Because reputation and ranking is important, the best students in the world and in the United States will go to first tier, top-ranked universities. In order to compete with similarly ranked universities there has to be an advantage to attract them to this department. Funding is one of the ways this department tries to get the best they can.

In conclusion, the participants were very eager and open about discussing funding and research. They explained that funding is something they definitely consider in many aspects of the department including research that in turn lets them have more students which increase the department's visibility. All of these issues are influenced by globalization in the sense that the competition exists in the world; and the research is shared all over the world, the students come from all over the world. The existing

interdependence is mostly as a result of indirect connections. For example, the high number of international students cost the department more than what it would cost for domestic students. However, in return, it is stated that these students carry on most of the research and therefore secure the grants for the department because as stated by the faculty, there are not enough qualified applicants domestically to sustain the department. In the interviews, this fact was also explained by the faculty members. In fact, the department chair made a comment that "this department cannot exist without international students." The actions of the department are influenced by globalization by expanding the playing field.

Where are the American Students?

In collecting data, I asked the participants why there are so many international students. Because of all the talk about the need for quality students to keep the department performing and publishing good research, I expected the answers to be discussing the high quality international students. Although there were a couple faculty members emphasizing this; to my surprise, most participants answered in terms of why there were less Americans. Again, globalization was not the purpose of admitting international students, but admitting them was caused by globalization.

In analysis of the reasons of the lack of domestic students in the graduate section of this department, I came across a couple different trends. One is that it was difficult to find qualified domestic students. The rationales were that the domestic students did not have the adequate preparation in science and math fields, and the ones that were qualified went to top tier graduate schools. Another reason of the scarcity of

domestic students in graduate computer science education is explained to be due to the lack of interest from the students' part. The computer science field being a highly applied field, the students do not need to get PhD's in order to get good jobs, and the time spent on a PhD was not regarded as a good investment for this reason.

Here are some of the interview transcripts from the faculty on the subject of why there are so many international students.

> **Researcher: I have noticed you have a high number of international students. What are the reasons for that?**
>
> **Dr. Shelly:** We try to admit as many domestic graduate students as possible. That's not sufficient to give us enough students.
>
> **Dr. Phutan:** When you say high, actually that is a relative term. Our proportion of international students in our PhD is less than the national average in the US. We are doing very well. We are doing much better in terms of recruiting the domestic students.
>
> **Dr. Mark:** Oh well, that's easy. That's because domestically…Riverside as a campus is relatively small and new and so, domestically we don't have the visibility.

In the above examples, we can see that even though the question directly asks the purpose of having a high number of international students, the participants answer in terms of domestic students. Dr. Phutan brags about having less international students than the national average. In my question, I don't believe I have a negative connotation when asking about international students. I don't use the words "too many" or I don't

ask “why are there fewer domestic students.” This gives me the indication that having a high number of international students is not considered as a choice but a necessity.

Again, answering the same question, some faculty members give reasons for the lack of domestic students as well:

> **Dr. McLean:** Unfortunately I think it’s partially the failure the American educational system, you know K-12 and undergrad, people don’t go into sciences as much here.
>
> **Dr. Perinski:** It isn’t that domestic students are not smart. They just have different priorities. Also, the educational system here. Science and math are not emphasized.
>
> **Dr. Tasos:** International students are by far better than the local students that we get.
>
> **Dr. Chang:** I think main reason is domestic students, some of them tend to shy away from engineering and computer science because of mathematics. They are afraid….This is mostly because of the education system here high school and so on, they are afraid of mathematics.

In the examples above, the reasons for having a high number of international students are explained in relation to the lack of preparation of American educational system for these fields. In the interviews, the students also explained the reasons for having a high number of international students in the department in terms of the lack of domestic students, but they have not mentioned about the lack of preparation of domestic students

in scientific fields. The reasons the students mentioned mostly revolved around why the domestic students do not *choose* to go to graduate school in computer science.

> **Barry (Philippino American):** Maybe computer science is young, domestics want to go elsewhere.
>
> **Wei (Chinese):** Maybe Americans not interested in engineering majors.
>
> **Yueh (Chinese):** Main reason I think domestic students think computer science is too boring.
>
> **Saachi (Indian):** I think that's the basic trend in all CS departments in the US. I don't think American students go for PhDs
>
> **Philip (Greek):** I think it is because in computer science you can find a well paid job in the U.S. American undergrads don't want to spend 5 more years. Computer science is very applied, you can do it as a bachelor. That's why because lack of interest from resident students.

The students here talk about the lack of interest of the domestic students in choosing computer science. Philip explains the lack of interest in the way that it is not necessary for domestic students to go to graduate school to find a good job. Dr. McLean and Dr. Calsoyas also emphasize this as one of the reasons for lack of interest.

> **Dr. McLean:** I guess Americans have the option of going straight from bachelors to Google for example, whereas a foreign student has to go through a PhD program to get a green card, that's part of it too.
>
> **Dr. Calsoyas:** It is the way market works. Domestic students don't go to PhD route because even with a masters or bachelors in Computer science

> they can get good high paying jobs. If they want an academic job they do a PhD. But there's not as much money in academic jobs than industry. Instead of going through a doctoral study which will take 4-5 years, they spend that time building their skills at work getting paid.

The comments indicate that there is a good job market for students who graduate with a bachelor's degree in computer science and it is explained as one of the reasons domestic students don't continue with graduate education in this field. The undergraduate students in computer science are mainly domestic students with only 2% of them being international (department website). If most of these students choose to get jobs instead of going to graduate school, there becomes a need of students. The international students, in this sense, is filling a gap created by the market and its needs.

The lack of interest and qualifications of the domestic students is not the only reason international students end up at this department. It is also indicated that the pool is increased, therefore, finding quality students from a larger pool is a factor in the student demographics of the department. Dr. Tasos and Dr. Mohi mention this as well.

> **Dr. Mohi:** The majority of applications come from international students, the world is a big place, there's great students everywhere.
>
> **Dr. Tasos:** At this point, the shortest answer is that these are the best students that we can get to provide the basis for a successful graduate program. And so far according to my experience and I believe this is the experience of other people as well, the international students are almost by far better than the local students that we get

Simply put, this is a statistical representation of why there are more international students. The pool is larger, therefore more qualified students are around.

Whether it is disinterest of the domestic students creating a shortage, or the interest of qualified students worldwide creating a surplus of qualified students; globalization is closely tied to the graduate student intake of the department. The reason the word “globalization” did not come up at all during this discussion is that the participants are not consciously weighing globalization when selecting students. Globalization is the means the participants can fulfill the needs of the department; it is not the reason why they do it.

Finding Qualified Students

One of the most important issues in the cycle of the department life is getting quality graduate students. This is one of the gears that keep the wheel moving in terms of determining the department’s success. The funding is obtained from grants, the grants are used to do research, the graduate students perform the research, and the quality of students determines the quality of research. Therefore, the competition is increasing to recruit the best students in the field.

When the participants talked about “quality,” I wanted to find out about what they look for specifically in an applicant. Because globalization was still in my mind when I inquired about this, I was trying to see if the participants mentioned it specifically. Most of the answers were pretty similar in terms of grades, GRE exam results and professor recommendations from their previous institutions. The faculty mentioned that there is a risk involved in accepting international students for the fact

that they come from various institutions and it is difficult to determine if the application reflects the true talents of the student.

> **Dr. Shelly:** international students, they are usually very good, and they're somewhat more of a risk because you are not certain…it's harder to judge the application, letters of reference and things like that. We take some of those into consideration.

Dr. Strong explains further,

> **Dr. Strong:** What happens in a department that is not top ranked like this is that you get a lot of applications in wildly varying quality. And what you don't have is much information about the applicants. I mean you might have a couple of test scores or letters of recommendation but most international applicants you don't necessarily know that much about people who wrote the letters or programs and so on… What that means is you get kind of high risk applicants. Relative to schools that are good. It doesn't mean the students are not good, it means that you don't know. We end up with a wide variety of students and some of them are really good and some of them aren't so good and sort of all over.

The requirements to be accepted into the program are not influenced by the nationality of the applicants. However, the evaluation of the credentials of the applicants is influenced by the nationality of the applicants. Familiarity with the country's educational system helps in evaluating the applications. This was one of the points

made when I asked about what the faculty look for in students that apply to this department.

Researcher: What do you look for in a student that applies here?

Dr. Tasos: Yeah, that's also very complicated process, so it relies on the experience of the recruiting committee. But it's also a combination of the school they are coming from, the grade that they have from that school, because the grades can vary by school and by country, the recommendation letters that they get. Often they rely on personal contacts within a particular university that provides an out of bound source of information and then, the GRE scores are an indication too but I wouldn't necessarily go with the GRE scores. I would definitely put more weight on the school and the grades from that school and the references letter, and often sometimes people come with published papers and so on and that is also a big consideration.

Dr. Perinski: Faculty from different countries review applications and rank them according to the reputation of the institution they are from.

Dr. Phutan: Well what we do is kind of, depending on the applications, we divide it into four categories: One is domestic, students from Europe, students from China, students from India. So we have a committee, graduate admissions committee. Usually depending on the number of applications, the committee decides they are going to say recruit 30 students this year from domestic or students from India, the committee decides according to the applications.

The point of having professors from the same countries to evaluate potential students is a strategy faculty has to identify quality students. By this way, the grades and the recommendations would have more merit as they are familiar with the countries and the risk of admitting students with dubious background information is lessened.

Another factor the faculty mentioned in picking students was the prior research or publishing experience. This seemed like a good indicator of their work and was valued more than the GRE scores or grades from their previous schools. This was evident in some of the comments the faculty made in identifying what they look for in a graduate applicant.

> **Dr. Chang:** … if there's any record of research especially publications that's probably most important thing. And other than that, their GPA from a reputable college.
>
> **Dr. Mohi:** Strong GRE scores, completion of the right background courses, strong grades in those courses, good letters of recommendation. We also look for if they have any research background. That tells us more than the grades or test scores.
>
> **Dr. Shelly:** …definitely I am looking for for their potential to excel as a researcher, that education commitment, for them being serious, technical abilities, you know intellectual curiosity, background skills, it is a combination of factors.

Dr. Lane : If the students done anything interesting in the industry or something that can also be a factor. Like research? Yes, definitely, or just real industrial experience.

Dr. Calsoyas: Which university they are from and any research experience they have. Then GPA, then letters of recommendation. Lesser on the GREs.

Dr. Tasos: I would definitely put more weight on the school and the grades from that school and the references letter, and often sometimes people come with published papers and so on and that is also a big consideration.

Because most students move from having a bachelor's degree directly into the PhD program, most of them do not have prior research experience. They said they knew what area they wanted to research but they did not have any completed research. However when I asked the students "what do you think the faculty look for in students that apply here," the students also mentioned this was one of the points the faculty looks for.

Saachi (Indian): Good GPA, research experience, good recommendations.

James (American): They look for more potential for research. If you have done research before that's a big plus, they invest in you as researchers, make sure that you don't drop out.

Murat (Turkish): Potential for research. Recommendations are important. Grades, but grades don't tell so much.

Yueh (Chinese): Research ability, how much self motivated they are. Publications, the top tier university, GPA, reference letters, recommendations.

Wei (Chinese): Potential research ability, publication if you have it, GPA, personal connection with faculty, good relations with faculty, recommendations.

The students were quite accurate in knowing exactly what the faculty was looking for in terms of admitting students into the program.

I also inquired about the competition around the world for international students based on the literature review (Altbach, 2004; Labi, 2006; Marginson, 2007). The literature indicated that the competition for qualified international students have intensified the recruitment efforts for these students. When I asked about this to the faculty, there were differing opinions.

Dr. Mark: I think most competition for grad students has been domestic within America right. UCR is probably lowest or lower ranked in the UC system, and of course very good students want to go to MIT, Harvard, Berkeley, Stanford, classical places. So for students we compete usually at American instutions, because students want American education basically whether they are from India or Turkey or from Hong Kong, they really value American education, it says a lot about their marketability.

Another professor thought otherwise:

Dr. Lane: Oh yeah, of course. Yes we do, for example some of the students we admit might go to other institutions in Canada. We lost students to Canada. And in the past also, I think many of the European students used to come to USA but now they tend to stay in Europe. Especially after the Gulf war. And then we also have some Chinese students preferring Hong Kong or Singapore. Some very good universities there. Some of them maybe their parents prefer them being closer to their families and so on.

Because of the differing opinions I asked whether there was a decrease in the international applications or a change in the qualifications of the international students that apply. I found out from the staff that handles the initial applications that there was actually an increase from the previous years in the number of international applications and initially, their qualifications seem to be sufficient to be admitted into the department. This shows that although generally other countries are increasing their international student intake (IIE, 2010), this department does not experience a fall in the number or quality of students that apply.

As far as investigating the quality of the entering students into the program, there are certain issues that emerged. One is that although globalization increases the pool of qualified applicants to the program, it is harder to evaluate them if they are from different countries. The faculty has a system of evaluating students from the same nationality to lessen the risks associated with various background information. They have not mentioned globalization when explaining about these processes. In addition, the previous research experience is a better indicator than the grades or tests for the

evaluation process. Globalization also influences the criteria to look for when selecting students. As far as the increasing competition is concerned in the world for qualified students, this department seems to continue to receive a high number of qualified applications. Neither the qualifications, not the number of applications seem to suffer because of this competition.

Conclusion

Findings from interviews, documents collected and observations suggested that the participants in the study engaged in globalization in various ways. However, this engagement is not a result of conscious consideration of globalization for their part. Globalization rather comes out as a consequence of actions and not as the purpose of the actions they engage in the department. The four areas identified by the literature to explain the phenomenon of globalization were not very helpful in identifying globalization in the department. When investigated directly by asking specific questions in political, economic, social/cultural and academic aspects of globalization, it was found that the questions created more confusion and rejection. Instead of shedding light on the subject, this approach to questioning members of the department made it harder to identify how globalization takes place which was the purpose of the study.

What was helpful in identifying globalization was that some themes were surfacing throughout the interviews. These themes revealed parts of the life in the department that were most important to the participants. Globalization was not the purpose or even in the language of these themes that included ranking, research and funding, the importance of finding domestic students and finding quality students.

However, these themes indeed included the concept of globalization as the consequences of the actions of the members in the institution created the concept of globalization. Therefore, the global interdependence identified as globalization came out of the needs of the department and the availability and ease of such connections made globalization possible. However, this also is a cyclical concept that the needs create a certain way of conduct, the increased connections by technology eases this way of conduct and because of this outcome of interconnectivity (that is called globalization), a new culture of getting things done emerges in institutions.

Throughout the themes, I have also noticed that there was a contradiction felt between the university being a state university and its perceived obligations to what is actually happening. The organization wants to comply with the mission and purpose of the university that prioritizes locals. However, it is also a benefit for the organization to take in strong students local or not. There is a legitimate reason for preferring the international students based on their academic background. However, there is still a discomfort about it not based on the high numbers of international students, but based on the small number of domestic students in the department.

It is legitimate to hope for 100% domestic students because this university is a state university with obligations to the local populations as was mentioned earlier. The pragmatic aspects of fulfilling the interests of the organization are what the faculty was emphasizing, not the relation it had to globalization.

Chapter 5

Conclusion

Discussion of Findings

This research began with a review of scholarly literature describing globalization in order to see how this concept might be manifested in a university department. The people in this department seem to be directly aware of this phenomenon called “globalization.” They interact with it; therefore, I assumed that they have a perspective about how it influences the department. The language I use “how globalization INFLUENCES the department” also implies that globalization is something that happens to people. In the literature, globalization is considered a phenomenon perceived either as a condition or as a process (Tomlison, 1999; Levin, 2001). In both cases, whether we consider globalization as a condition or a process, the assumption in the literature is that it is a phenomenon that has an effect on every aspect of our lives. Globalization is happening to people (like a big wave coming) and how one reacts to this phenomenon will determine whether it is beneficial or not. Whether we buy groceries at a local market, or educate students from various backgrounds, globalization is a part of our lives. Developing skills to handle this occurrence will benefit institutions to reach their goals (Knight, 2003, De Witt, 2005). The literature conveys globalization as a fact that describes global connectivity and interdependence; and the opposite would be isolation (Fairclough, 2002). Isolation here is defined as not having any connection outside of a certain geographical locale, which hardly exists in today’s world, especially where technology is present (Beerken, 2003; Friedman, 2005).

The academic field of Computer Science is recognized as a global field; the demographics of the department as having a high number of international people, and the location of the department in California as an international hub reinforced my assumption that globalization has an effect on this department. In the literature, globalization is defined as the practice of growing interconnectivity and interdependence between people of the world economically, socially, culturally, politically, environmentally, scientifically, and technologically (Tomlison, 1999; Levin, 2001; Marginson, 2007). From this definition, I wanted to see how the people in the department interacted with the concept of globalization, and if or how this reflected in their work environment. In other words, how did they "handle," "manage," or "deal with" this phenomenon. The study does not seek to describe how globalized the department is. The study focuses on how the people in the department interact with the idea of globalization and give meaning to it.

In order to understand this phenomenon, I considered several factors. I wanted to see to what extent globalization defined in the literature corresponds with what is perceived to be happening in this department. Because the department is made up of mostly international people, I wanted to find out the implications of this fact to the department as well. Then, considering the viewpoints revealed in the data, I analyzed the results in the light of globalization and institutional theory.

The Faculty Attitudes

The findings indicated that the faculty and the students' viewpoints differed in the way they viewed globalization. I concluded from the interview data that the way

they define globalization revealed how they interacted with the concept. The faculty did not appear to consider globalization as something related to actions in their day to day lives. They could define it intellectually as a phenomenon that happens in the world, but in terms of describing the department, globalization was not a part of their vocabulary. They did not explain any important features of the department in terms of globalization or global connections. For example, when they talked about the goals and the mission of the department; globalization or global connections were not mentioned. Instead, the answers they gave for the goals of the department emphasized: The ranking of the department, conducting good research, getting good students, getting more grants (money). These areas are interconnected and reinforcing: if they have good students, they do good research, they get more money, and they go up in ranking. If they go up in ranking, they get better students, do good research, and get more money. All of these areas are closely related to the global interconnectivities identified as globalization. The ranking is considered ranking in the world for the reasons that the computer science world does not exist in one country, and the groundbreaking research could come from anywhere in the world. The student pool is deeper in the world; such as the best students in China outnumber the total student population in the US. The grants are mostly from United States, but the work force implementing the grants come from all over the world. Importantly, however, the faculty did not point out these global characteristics when explaining departmental work characteristics. It is not that they don't have an understanding of the concept of globalization; they indeed do (as is seen in their definitions and examples), but they do not talk about it, even though they are, indeed,

contributing to the definition of this phenomenon. The consequences of their actions created the concept known as globalization; their actions were driven by the goals of the organization.

In addition, when the faculty members were explaining a concept and I asked them to relate it to globalization, they responded uncomfortably. There was a noticeable hesitation in response to my probing. Their hesitation may not come from their resistance to the idea of globalization, but just that they wanted to say to me the reason behind their actions and decisions are not caused by globalization which they thought I wanted them to say. I believe this because they knew the subject of my study is about globalization. This does not mean that the faculty thinks the department is "isolated" or that they are against globalization. It is just that their reality was not influenced by globalization in the way that I anticipated. For example, time and again they made the point of ranking of the department, doing good research and getting grants for such research as being the most important things in the department. When I kept probing with globalization questions, the resistance occurred not because they want to resist globalization's existence in the department, but because they wanted to make a point that globalization is not the main goal for the department.

In institutional theory, organizations become legitimate by taking on practices and acting in ways that are considered to be proper or appropriate by different groups of stakeholders and field level players (DiMaggio and Powell, 1983; Meyer and Rowan, 1977; Suchman, 1995). Being a part of a state funded institution, and spending taxpayer money on educating citizens of other countries is a sensitive issue in the department

studied. California taxpayers are major stakeholders in this institution. For these stakeholders, paying for international students is not technically the goal of the department according to the testimony of the faculty in the department. Their discomfort was as a result of their responsibilities versus their actions. Most of the funds for the department come from domestic sources and spending them on international students when the mission of the university is "to educate California citizens" puts the faculty on the spot and discomfort is experienced. Not emphasizing globalization and its influence on the institution may be a conscious or unconscious reaction to this conflict laden situation.

The faculty's similar attitudes regarding globalization reveal that they hold a collective position. Moreover, their collective view of globalization is not consistent with the literature reviewed at the onset of this research. The literature sees globalization as a big part of higher education, and asserts that it can be utilized to reach the goals of the institutions by politically, economically, academically and socially aligning the institutional practices with globalization (Knight, 2003, De Witt, 2005). In this study, however, the faculty does not rely on thinking about globalization in setting goals and programs while their behavior can be interpreted as responding to globalization. The faculty utilizes a logic of action that does not require consciously planning for the globalization process.

When I asked the question "Why are there so many international students?" I put them on the spot as if questioning the legitimacy of such action. The evaluation of legitimacy almost always surfaces when the legitimacy is questioned or under attack

(Boulding, 2007). In asking this question, I thought, "I" as a former international student, can ask such a question without it sounding like I am directly questioning legitimacy, however, the explanations were exactly that, providing legitimate reasons. The reasons given ranged from "American students are not academically strong enough" to "we are not the only ones, everyone is doing it." The first answer used the department's value of academic excellence as a legitimacy source and the second answer demonstrated isomorphism.

The Student Attitudes

The students' views on globalization on the other hand were very welcoming and positive and there was a definite comfort with the concept of globalization. There was no hesitation or resistance to talk about this concept. They were ready to discuss it and give examples from their lives and academic endeavors related to globalization. They explained what globalization has gained for them mostly in socio-cultural and economic terms. They accepted globalization as a phenomenon that benefited them and tried to explain how they use it in many areas of their lives such as the comfort of functioning in different cultures.

The difference in the attitude of the faculty and the students may be because the students do not feel the dissonance the faculty feels about attributing what is happening in the department to globalization. Globalization is something they feel comfortable acknowledging as a factor in why they are here. They wanted to come here, and they exercised their autonomy in choosing among places in the world. Their autonomy was not undermined but validated. They are proud to accept the influence of globalization

because it does not limit them but liberate them. Increased ease of global interconnectivity and interdependence benefit their lives. The students may also carry this attitude because of a generational difference too. Globalization as a concept and a vocabulary that existed since they were born and it is only natural to feel comfort in identifying with the concept.

The students' views demonstrated that the concept of globalization was legitimate internally. They did not mention or seem to care about the approval of related entities in the organization's environment like the policies of the university or the local stakeholders. They did mention the outcomes of going to a university in the United States increasing their chances of employment, therefore strengthening the legitimacy of a decision to come to this university. They did not mention anything that could question the legitimacy of their existence here.

It is difficult to prove the causality of behavior, but the patterns in the data can be explained through theories that have been studied before. Overall, this study reveals that globalization is not perceived in the same way by different groups of participants in an organization. The reviewed literature does not make a point of this difference in people and the way they choose to interact with the concept. It is explained in the literature that globalization happens to people, and people can use it for their benefit naming it internationalization. Globalization is defined in prior research as connecting and opening the possibilities in the world. Endangering the legitimacy of an organization by opening it to the world is not an area that was covered in the light of globalization. Internationalization is seen as a reaction that benefits a higher education

organization with globalization happening. In this department, the faculty knowingly benefited from the global opportunities like choosing quality students from a wider pool of highly qualified students instead of choosing only domestic students. Faculty regarded globalization not as a choice but as a state in which the world is in.

Implications for Policy and Practice

The Perceptions of Globalization at a Public Research University Computer Science Graduate Department focuses on the concept of globalization as perceived by the players in the department. Particularly the faculty and students' perceptions were emphasized and analyzed. These analyses can inform both policymakers and administrators about how perceptions can influence the practices in an institution. Globalization is an inevitable force influencing higher education institutions. In this study, we can see in what areas these influences are actually visible in the department. This information can be utilized to further understanding of this phenomenon, as well as to benefit the institution in reaching its goals.

Among the most important implications for policy development and institutional practices that can be employed from this study are:

1. One of the difficulties in understanding globalization especially in terms of higher education is that the word globalization is hard to define. This study has identified important concepts of globalization and how it relates to practitioners in higher education defined by literature and findings from the data collected (Altbach, 2007; Armstrong, 2007; Beerkens, 2003; Spring, 2008). Specifically, policymakers can use

definitions in this study as expressed through literature and by the participants, to understand that differences do exist when defining global terms in higher education. In addition, this study brought these definitions to the departmental level by investigating into the more specific components of departmental life in a higher education setting. Policymakers may exercise this information as it relates to university departments when writing and applying global education policies and reforms that affect institutions involved the globalization process. And researchers may wish to analyze terminology, definitions, and discourses presented in this study with a clearer insight on how globalization is perceived and applied in a department setting.

2. Language problems. One of the issues that was brought to my attention by both the faculty and the students were the lack of opportunities for improving English for international students. By providing options and activities, the confidence and the ability of the students in this matter can be increased and this in turn can be beneficial to the department overall.

3. Improve American Math Education. In a more general sense, one of the findings indicated that there is a gap between mathematically how well prepared American students and their international counterparts. This finding confirms more focused studies on the similar issue of American students lagging behind many other countries in math education. Although more research would be needed to pinpoint the exact nature of

the problems indicated, this should be considered by education specialists to be an area of importance for American Education System.

Areas for Further Study

As a study of a single department, this study raises more questions than it answers. There is considerable research on the subject of globalization; however it is still unclear how the various stances on the subject will influence the culture of organizations and organizational behavior. The first area of interest that was revealed in this study is the relationship between the people that make up of the department with the concept of globalization. Their understandings of the concept as well as their attitudes are investigated. In order to get more depth on the subject, the origins of the behaviors can further be investigated. The limitations and liberties presented by the world experienced by academicians can further understanding on the subject.

We live in a polarizing society. Social issues are usually interpreted in areas of "either-or" mentality. People often feel that they have to take sides on matters that involve their lives such as liberal or conservative, bilingual education or English only, for or against abortion, capital punishment, immigration, globalization and so on. Scholarly research could improve our understanding in analyzing popular concepts and how their perceptions are influenced by the environment. The areas of further study will be defined as a series of topics with a brief explanation of each.

1. Academic networking and globalization. This topic can investigate the networking opportunities created by globalization and how these opportunities result in collaborations. In the study, several international

networking practices were mentioned. However, these networks were not fully explored and the implications of these networks were not investigated further. Utilizing the findings of the research as a base, networking practices, origins, opportunities and benefits can be investigated to shed light deeper into the networking practices in departments.

2. The implications of rising international student mobility for computer science graduate studies. As this study has identified, there are many issues related to rising mobility of international students such as selection and quality issues, the countries they are from, increasing number of applicants. These issues each can be basis for an investigation that furthers understanding on the student flows in this particular field. By looking into only the issues related to graduate student flows, the trends and details can be seen. This detailed information then can help similar departments and practitioners to employ strategies to improve their practices.

3. Prestige Maximization. In higher education prestige is important to the financial survival of the organization. Prestige maximization refers to the research excellence competing directly with undergraduate instruction. In studies by Lane &Kivisto (2008), undergraduate instruction is seen as preventing faculty from prestige generating research activities. This could be an area that can be explored that this project did not cover.

Although findings from this study are not generalizable, they could lead researchers to investigate members of departments at other types of institutions in higher education, such as community colleges, private institutions, or universities outside the United States, or other departments in the same institution. Future research could compare and contrast how participants at different types of institutions or departments define globalization differently or similarity than the faculty at CU. All these investigations can further our understanding of this complicated phenomenon and provide researchers, policymakers and practitioners the necessary tools for making sound decisions as well as providing organizational models.

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