

**Analysis of the Relationship between Internationalization and
the Quality of Higher Education**

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Ji-Yeung Jang

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Dr. R. Michael Paige, Adviser

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ABSTRACT

The universal phenomenon of internationalization as a mainstream element of higher education is often based on the assumption that there is value added to the quality of higher education systems when enhancing the international dimension of teaching, research and service (Knight, 1997). Questioning the validity of the assumption, this study examined the relationship between internationalization and quality of higher education. Using the pre-existing data collected originally by Horn et al (2007), Lombardi et al (2003), and *U.S. News World and Report* (2003), the study conducted the simple correlation analysis and the multiple regression analysis. The research variables included six internationalization variables such as international students, U.S. study abroad, internationalized faculty and scholars, international research activities, internationalized curriculum, and organizational support; and seven quality variables such as research competitiveness, faculty competitiveness, undergraduate competitiveness, advanced training competitiveness, financial stability, constituents' satisfaction, and institutional reputation. The results showed that there was a positive relationship between internationalization and quality of higher education. Particularly, the presence of international students was found to have statistically significant and positive effects on all the quality variables except for the research competitiveness. Internationalized faculty and scholars had statistically significant effects on advanced training competitiveness and financial stability. Also, the organizational support for internationalization played a significant role in institutional quality enhancement. However, internationalized curriculum was found to have no effect on any quality variables. Based on the results, the study suggests that various internationalization strategies be conducted and measured properly as part of the institutional quality improvement process.

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CHAPTER 1. INTRODUCTION

Internationalization is perceived as a mainstream element of higher education across many countries (Harman, 2005; Kehm & Teichler, 2007) and especially, “one of the most powerful substantive developments in the history of American higher education” (Groennings, 1987, p. 2). Coping with the growing pressures of globalization, universities have become more internationally active through increased student and staff mobility (de Wit, 2006). Moreover, De Wit (2006) argues that the calls for internationalization of universities have become increasingly popular in influencing not only the way university curriculum is designed but also the way university research and management is organized.

According to Knight (1997), a rationale for internationalization is “a complex and multi-leveled set of reasons which evolve over time and in response to changing needs and trends” (p. 14). Despite the existing diversity, the most commonly recognized rationales for internationalization of higher education include political, economic, academic, and socio-cultural rationale. Among the four rationales, academic rationale assumes that there is value added to the quality of higher education systems when enhancing the international dimension of teaching, research and service (Knight, 1997). This premise is clearly based on the assumption that internationalization is considered to be central to the mission of the institution, a positive change agent for institution building, and most importantly, of high quality itself in order to contribute to enhancing quality (Smith, 1994; Knight, 1997). One way to link internationalization to the quality of education is through achieving international academic standards for teaching and research to ensure that the quality and standards of the education system of higher

education institutions meet international standards (Knight, 1997). This aspect brings an issue of reputation, both national and international, that most universities seek to be competitive or at least keep pace with its peers (Biddle, 2002). Biddle (2002) maintains that the university must meet the challenge of internationalization so that it would “enhance its visibility and stature internationally, and this in turn would put it in a stronger position to recruit international students and faculty, and develop collaborative partnerships with overseas universities” (p. 7).

Statement of the problem

Supporting the academic rationale for internationalization, there have been conceptual efforts to link internationalization to the quality improvement in higher education. Knight (1997) and De Wit (2000) argue that many stakeholders of higher education believe that internationalization will enhance the quality of education because internationalization is good as such. Many national and institutional policy trends indicate internationalization to be a means to enhancing quality rather than an end in itself. For example, universities in Latin America in the late 1990s embraced internationalization as part of a strategy to improve the quality of education (Avila, 2007). According to Avila (2007), there was an urgent need to develop human resources with international competencies in Latin America because of an economic opening through international commercial agreements in the mid-1990s. This caused considerable growth in international academic activities. Thus, universities in Latin American adopted internationalization strategies to improve quality of higher education, academic and institutional prestige, and a competitive edge at national level (Ibid).

Taylor (2004) compared different strategies and attitudes for internationalization among four universities in different countries such as University of British Columbia (UBC), Canada; the University of Chicago, United States; the University of Uppsala, Sweden; and the University of Western Australia (UWA), Australia. In his article, the author shows various examples of how the concept of internationalization is associated with quality as measured by international standards. For example, UBC sees internationalization as a fundamental process necessary to enhance quality, to provide benchmarks for both teaching and research, and eventually to strengthen the university's core mission of teaching, research and service. Similarly, UWA claims to conduct teaching, research, and service at the highest international standards to attain international excellence. Furthermore, the University of Chicago believes that recruiting the high quality of international students contributes to the academic strength, vitality of the institution, and in the long run, the international reputation of the university. All three institutions consider internationalization to be a means to achieving high quality education not only nationally but also internationally.

Huang (2003) maintains that universities in China are promoting internationalization through transnational higher education systems and introducing foreign curricula and textbooks to improve academic standards and to enhance the quality of education and research. Even though the Chinese case is unique because of the characteristics of transnational higher education, which are different from the 'mainstream' internationalization strategies at higher education institutions, it is clear that Chinese higher education policies on internationalization are based on the academic rationale.

These policies and strategies are based on the assumptions that international cooperation and student, faculty or research exchange allow for various intangible outcomes such as mutual learning and synthesis of best practices, and eventually contribute to the quality of processes and outcomes of individuals as well as institutions (Kälvermark and van der Wende, 1997). In fact, some higher education institutions often use the data of the high number of international students, study abroad participants, and international activities as evidence of the international ambience on their campus and also as a validation for the educational quality (Choi, 2003).

Even though numerous publications discuss the merit of internationalization (Altbach & Teichler, 2001; Edwards, 2007; Harman, 2005; Huang, 2007; van der Wende, 2007), there is discrepancy between the rhetoric and the reality in practice. In other words, it is unclear whether internationalization of university has really enhanced and enriched students' learning experiences and improved the quality of education (Ka Ho, 2007). Van der Wende (1999) makes the point that the arguments of the researchers and the policy statements are just 'assumptions'; that there is little empirical evidence on the relationship between internationalization and quality. Knight (2001) calls the assumption a "myth" accompanying the great leap forward in the internationalization of colleges and universities. Knight (2001) questions the validity of the academic rationale as follows:

There is a perception that the more international a university is, the better it is and the higher quality its programs are. Of course, we want to believe and ensure that the international dimension of teaching/learning, research, and service is enhancing the quality of education, but do we have a way to prove it? (p. 233)

Another problem associated with the academic rationale is the fact that the institutional assessment systems in most countries do not take into account the effect of internationalization on the quality of education (van der Wende, 1999; Snellman, 1995). According to Snellman (1995), the discrepancy is because international activities are viewed as being detached from the work of the university and as having little or no bearing on the quality of education in reality. In the case of Latin America, international programs were not explicitly linked to strategies aimed at quality improvement even though the internationalization policy was set based on the academic rationale (Avila, 2007).

Purpose of the study and research questions

Given the problems presented above, the purpose of the study is to investigate the relationship between internationalization and the quality of higher education. In the attempt to address the purpose of the study, this study asks two research questions:

1. What is the relationship between internationalization and the quality of higher education?
2. To what extent and in what ways are internationalization variables related to quality variables?

Definitions

Internationalization

In the current study, I employ Knight's most current definition of internationalization which is "the process of integrating an international, intercultural or global dimension into the purpose, functions or delivery of post-secondary education" (Knight, 2003, p. 2). The reason why I chose this definition is its comprehensiveness

which allows us to relate every possible international dimension to all aspects of higher education and the role that it plays in society (Ibid).

Quality of higher education

In the current study, I employ the transformative perspective emphasized by Harvey and Green (1993) and the value added perspective supported by various researchers, such as Pascarella (2001), Astin (1985), and Bergquist (1995) to define the quality of higher education. As a result, the quality of higher education can be defined as the extent to which the educational experience at a particular college or university program enhances the knowledge, abilities and skills of students (Harvey and Green, 1993; Astin, 1985) or the differences that the higher education institution has made in the growth of all members of the institution, including intellectual, moral, social, vocational, physical, and spiritual development (Bergquist, 1995).

Significance of the study

Overall, the results of the study are of interest to the various stakeholders of higher education, such as international educators, higher education administrators, faculty, and students. More specifically, there are several reasons why this study is significant. First, it is critical to minimize the gap between the conceptual assumptions of the effect of internationalization on the quality of higher education, and the actual relationship between the two based on the empirical data. This way, both fields of higher education and internationalization will be better informed in policy making and implementation in relation to the quality improvement.

Second, it is necessary for the field of higher education to adopt a new paradigm in terms of evaluating its own quality and internationalization efforts. So far,

quality of higher education and that of internationalization have been considered separately when it comes to the institutional evaluation. However, the wave of internationalization affects various areas of higher education, which makes it critical to review the effect of internationalization on the competitiveness of higher education. Therefore, this study will assist higher education administrators and international educators to connect the two areas and make use of the resources more efficiently.

Finally, it is often argued that the internationalization strategies implemented throughout the campus have to be rearranged so that they make a bigger impact on campus rather than remain as fragmented activities. This study will add another perspective to the effort of reorganizing internationalization strategies by investigating the impact of internationalization on quality of higher education. In other words, this study will not only shed light on the relationship between internationalization and quality of higher education but also help find the most effective internationalization strategies that enhance quality of higher education.

Summary

This chapter presented the background of the problems, purpose of the study, research questions, and significance of the study. The next chapter will discuss the literature on the various issues of internationalization and quality of higher education.

CHAPTER 2. LITERATURE REVIEW

Introduction

The purpose of the study is to investigate the relationship between internationalization and quality of higher education. In the context of the research purpose and questions, this chapter provides a thorough literature review regarding the various issues of internationalization and quality of higher education. This chapter is divided into two sections. The first section examines the various aspects of internationalization of higher education such as historical development, definitions, rationales, strategies, current status, and assessment. The second section explores the quality issues in higher education including historical perspectives, definitions, models for improvement, and assessment.

Internationalization of Higher Education

Internationalization is perceived as a mainstream element of higher education in many countries (Harman, 2005) and in America as, “one of the most powerful substantive developments in the history of ... higher education” (Groennings, 1987, p. 2). At the same time, internationalization of higher education is highly debated in terms of its meaning and strategic aspects, and its relationship to developments in society and higher education (De Wit, 2002). This section of the paper provides the conceptual and organizational framework of internationalization of higher education while addressing the critical issues mentioned above.

Historical Development

A number of scholars agree that the university has always been global in nature (De Ridder-Symoens, 1992; Knight and de Wit, 1995; Altbach, 1998; Altbach and

Teichler, 2001). With its roots in medieval Europe, internationalization of higher education is believed to date back to the Middle Ages and the Renaissance period, when elite students and scholars traveled to different regions to obtain academic knowledge and other cultural experiences (Knight and de Wit, 1995.). The use of Latin as a common language and the similarities between different higher education systems in Europe enabled itinerant students to continue their studies in one institution after another (De Ridder-Symoens, 1992; Altbach & Teichler, 2001).

The history of the international nature of university education and knowledge transfer is also shared by other parts of the world. Strong (2002) argues that the Chinese, Indian, Greek, and Arab thinkers and researchers had made significant contributions in earlier centuries to better understanding of mathematics, biology, geography, astronomy, and engineering. Moreover, China, Korea, and Japan in the 6-7th century exchanged the academic and cultural knowledge by sending their students and scholars from one country to another. The main goals for the exchange activities were to teach and learn new knowledge as well as to develop their own educational system which was equivalent to the western higher education system (Ibid). Even though international nature of higher education has existed in various parts of the world historically, the most literature tends to highlight the western side of the story. Therefore, the current chapter focuses on the modern development of the internationalization of higher education in the western society.

During the period between the 18th century and World War II, internationalization of higher education is characterized by various aspects, such as 1) the export of academic systems from the European colonial powers to their colonies; 2)

continuous cooperation and exchange in academic research through seminars, conferences and publications; and 3) the mobility of a small group of elite students to prestigious universities around the world (Knight and de Wit, 1995). After World War II, international educational exchange expanded significantly due, at least in part, to the competition between the United States and the Soviet Union (ibid). According to Knight and de Wit (1995), both superpowers had clear political ambitions to gain a better understanding of the rest of the world and to expand their domains of influence. Overall, the objectives of those exchange programs were more related to diplomacy than to academic and cultural cooperation. However, after communism collapsed in the early 1990s, focus was placed on international cooperation and exchange in higher education aiming for economic development in the growing world market. More information regarding the economic aspects of internationalization is discussed later.

The history of internationalization of higher education shows that internationalization of higher education before World War II was focused on academic exchange. However, in the post-World War II era, economic and political arguments were the main rationales for internationalization. The following section explains how internationalization of higher education carries different arguments to justify its rationales in the present context.

Rationales

According to Knight (1997), an individual's, an institution's, or a country's rationale for internationalization is "a complex and multi-leveled set of reasons which evolve over time and in response to changing needs and trends" (p. 14). Despite the existing diversity, the most commonly recognized rationales for internationalization of

higher education include political, economic, academic, and socio-cultural rationales. While discussing the essential features of each rationale, it can be noticed that the term ‘international education’ is equivalently used as internationalization, even though the meaning of the two terms are distinct. As mentioned later, the term ‘internationalization’ has been used interchangeably with other related terms in the literature because of the multiple perspectives on the definition of internationalization.

First, as discussed earlier, political rationales were emphasized with the rise of the political influence of the U.S. as an international superpower after the Second World War (Knight and De Wit, 1995). During that period, international education was seen as a “beneficial tool for foreign policy especially with respect to national security and peace among nations” (Knight, 1997, p. 17). This optimistic view of international education as a peace-making tool is still prevalent in U.S. politics and higher education (de Wit, 1998). However, De Wit (2000) criticizes the political view of the U.S. toward internationalization arguing that the underlying idea of peace among nations implies western imperialism or superiority. De Wit (2000) questions,

Whose peace and whose understanding of the world? Was and is higher education in the rest of the world in a position to place its understanding on equal terms with that of the American and European academic world? Does such a view provide space for a national identity? (p. 14).

This cynical view toward American attitude regarding internationalization brings about another critical aspect of the political rationale. According to Knight and De Wit (1997), Asia-Pacific countries believe internationalization is not only about learning other cultures, but also understanding one’s own. Apparently, these countries consider internationalization as a way to strengthen and promote their national identity in a global society (Knight, 1997). In addition, some countries are interested in

importing education programs and institutions for nation-building processes because they believe an educated, trained, and knowledgeable citizenry and workforce are key components of a country's nation-building agenda (Knight, 2004).

Second, after the end of the Cold War, the emphasis on internationalization of higher education changed from political to economic reasons (De Wit, 2000; Groennings, 1990; Hamrick, 1999). In the early 1990s, American higher education was required to reorganize itself to educate students to become a part of the global labor force through developing international knowledge and intercultural skills so that the U.S. would maintain its economic competitiveness in the growing world market (Knight and De Wit, 1997; American Council on Education, 1995; Johnston and Edelstein, 1993). As a result, joint international research and development projects proliferated in order to compete internationally in the scientific and technological areas which are directly related to the national economy (De Wit, 2000).

Another aspect of the economic rationale for internationalization is related to the financial imperative of the universities (Biddle, 2002). Recently, higher education institutions have regarded high tuition-paying international students as a significant financial incentive and therefore made efforts to recruit more students from abroad (Baker, Creedy, and Johnson, 1996; Francis, 1993; Knight and de Wit, 1995). Moreover, some countries such as Australia and New Zealand have paid close attention to the marketing of higher education on the international market considering higher education as an export commodity in the form of satellite campuses and online delivery (De Wit, 2000; Knight, 2004).

Third, academic rationales assume that there is value added to the quality of higher education systems when enhancing the international dimension of teaching, research and service (Knight, 1997). This premise is clearly based on the assumption that internationalization is considered to be central to the mission of the institution, a positive change agent for institution building, and most importantly, of high quality itself in order to contribute to the quality of educational (Smith, 1994; Knight, 1997). One way to link internationalization to the quality of education is through achieving international academic standards for teaching and research to ensure that the quality and standards of the higher education system meet international standards (Knight, 1997). This aspect brings an issue of reputation, both national and international, that most universities seek to be competitive or at least keep pace with their peers (Biddle, 2002). Biddle (2002) maintains that if the university meets the challenge of internationalization, it would “enhance its visibility and stature internationally, and this in turn would put it in a stronger position to recruit international students and faculty, and develop collaborative partnerships with overseas universities” (p. 7).

Finally, socio-cultural rationales acknowledge cultural and ethnic diversity within countries as well as institutions as a strong motivation for internationalization (Biddle, 2002; Knight, 1999b). In fact, the socio-cultural rationale is supported by many smaller countries that perceive the preservation and promotion of national culture as an imperative for internationalization of higher education (Knight, 1997). This rationale emphasizes individual development as a local, national and international citizen with intercultural understanding and communication skills. Therefore, from the socio-cultural perspective, higher education systems with internationalized curriculum play

the significant role of preparing graduates to be “globally literate citizens” with a strong knowledge and skill in intercultural relations and communication skills (Biddle, 2002, p. 5).

These political, economic, academic, and socio-cultural rationales are frequently used by different stakeholders of higher education independently, in combination, and in contradiction to one another (Knight and De Wit, 1995). As there are different rationales for internationalization, there are also different definitions describing internationalization.

Definitions

As Knight (1999a) has observed, “internationalization means different things to different people and as a result there is a great diversity of interpretations attributed to the concept” (p. 13). People tend to use the term in the way that best suits their purpose. As a result, the meaning of internationalization has been commonly linked with international activities and is often synonymously referred to as multicultural education, international education, international studies, comparative education, global education, international programs, and study abroad (Knight and De Wit, 1995; Knight, 1997; De Wit, 1997; Green and Olson, 2003; Lian, 2003; Damme, 2001). Among various definitions, Knight’s (1994) four different approaches to describe internationalization from activity, competency, ethos, and process perspectives are particularly insightful. Following are the examples of the definitions based on these approaches.

First, the activity approach describes internationalization in terms of activities, such as curricular development, student and faculty exchange, intercultural training,

international students, and joint research initiatives (Ibid). Some definitions of internationalization using the activity approach include:

the multiple activities, programs, and services that fall within international studies, international educational exchange and technical cooperation (Arum and Van de Water, 1992, p. 202).

a large number of activities, including student mobility initiatives such as exchange programs, field schools, internships, and other study abroad programs; research and collaborative development projects with partners abroad; faculty exchange programs; offshore programs such as twinning arrangements and satellite campuses; and others (Schuerholz-Lehr, 2007, pp. 180-181).

Even though the activity approach is considered as the major way to describe internationalization, it has fragmented and uncoordinated characteristics which led internationalization efforts to be fragmented also (Qiang, 2003).

Second, the competency approach emphasizes “the development of new skills, knowledge, attitudes and values in students, faculty and staff” (Knight, 1997, p. 14). This approach focuses on the human dimension of development. Thus, developing internationalized curricula and programs is considered to be a means to developing the appropriate competencies in the higher education personnel so that they become more internationally knowledgeable and interculturally skilled (Ibid). Even though the human development is a critical element in internationalizing higher education, the competency approach is ineffective to encompass the holistic nature of the internationalization efforts.

Third, the ethos approach emphasizes creating an internationally supportive culture on campus (Ibid). According to Harari (undated), international education must encompass not only the various international program activities but also “distinct commitment, attitudes, global awareness, an orientation, a dimension which transcends

the entire institution and shapes its ethos” (p. 2). This approach believes that the international dimension of an institution can only be realized with a strong belief system and supportive culture (Knight, 1997), which can be connected to the significant role of institutional leadership and organization support for internationalization. However, as in the case of the competency approach, the ethos approach is not comprehensive enough to cover the complicated characteristics of internationalization at the higher education level.

Finally, the process approach is the most comprehensive way to describe internationalization (Knight and de Wit, 1995). According to Knight (1997), the process approach emphasizes the international dimension to be “integrated into the mission statement, policies, planning and quality review systems to ensure that internationalization is central to the institution’s goals, programs, systems and infrastructure” (Knight, 1997, p. 14). The most widely used definition with the process approach is “the process of integrating an international/intercultural dimension into the teaching, research, and service functions of the institutions” (Knight, 1994, p. 7). Ellingboe (1998) offers a similar definition to that of Jane Knight: “the process of integrating an international perspective into a college or university system” (p. 199). In addition, Ellingboe (1998) describes an ongoing, future oriented, multi-dimensional, interdisciplinary, leadership-driven vision that involves many stakeholders working to change the internal dynamics of an institution to respond and adapt appropriately to an increasingly diverse, globally focused, ever-changing external environment (p. 199). Both Knight (1994) and Ellingboe (1998) used the words *process* and *integrating*, which leave room for various interpretations. The process approach will make

individual members of staff and different organizational units respond differently to the internationalization within the same institution (Taylor, 2004). The difference between the two definitions by Knight (1994) and Ellingboe (1998) is the area of application and activities. Knight focused on the major function of higher education institutions whereas Ellingboe broadened its spectrum to the institutional system.

There are other definitions of internationalization with different perspectives in terms of its application scope. Van der Wende (1997) proposes a broad definition of internationalization which is “any systematic effort aimed at making higher education responsive to the requirements and challenges related to the globalization of societies, economy and labor markets” (p. 18). However, Knight (2003) criticizes Van der Wende’s definition because “it only positions the international dimension in terms of the external environment, specifically globalization, and, therefore, does not context internationalization in terms of the education sector itself” (p. 9).

A narrower approach in scope is suggested by Soderqvist (2002) which defines internationalization as “a change process from a national higher education institution to an international higher education institution leading to the inclusion of an international dimension in all aspects of its holistic management in order to enhance the quality of teaching and learning and to achieve the desired competencies” (Soderqvist, 2002, p. 29). Soderqvist’s definition emphasizes mainly the academic rationale, which is viewed as limited in its applicability (Knight, 2003).

In the current study, I employ Knight’s most current definition of internationalization which is “the process of integrating an international, intercultural or global dimension into the purpose, functions or delivery of post-secondary education”

(Knight, 2003, p. 2). This definition is an updated version of Knight's similar definition with the process approach. The reason why I chose this definition is because it is "appropriate for use in a broad range of contexts and for comparative purposes across countries and regions of the world" (Ibid, p. 10). While not specifying the rationales, benefits, outcomes, actors, activities, and stakeholders of internationalization, the comprehensiveness of the definition allows us to relate every possible international dimension to all aspects of higher education and the role that it plays in society (Ibid).

Strategies for Internationalization

While supporters of internationalization agree on the importance of internationalizing the university, the strategies for internationalization vary from institution to institution (Aigner, Nelson, and Stimpfl, 1992; Lian, 2003). Among the variety of internationalization strategies (Knight, 1997), there are also common strategies used by the higher education institutions. A number of authors suggest some frequently used program strategies of internationalization including student exchange programs; internationalized curricula; work, study, and internship abroad programs; recruiting international students; faculty and staff mobility programs; and international publications of articles and papers (Knight, 1997; Francis, 1993; Lian, 2003; McKellin, 1998; Henson & Noel, 1989 ; Harari, undated; Harman, 2005; Holzner & Greenwood, 1995). In addition, some most common organizational strategies are identified as expressed commitment by senior leadership; and student support services for both international students on campus and domestic students abroad (Ibid).

The American Council on Education (ACE)'s publication (2002), "Promising practices: spotlighting excellence in comprehensive internationalization" highlights

several institutions known for their outstanding achievements in internationalization efforts. Even though each institution selected has its own unique approach to improve internationalization, it is notable that some strategies are shared by all of them. Those strategies are: 1) including an internationalization goal in its mission statement; 2) encouraging study abroad participation by providing financial aid and developing new partnerships with universities abroad; 3) increasing the number of international students on campus; 4) internationalizing the curriculum; 5) promoting and rewarding faculty achievement in internationalization, including faculty exchange programs and research with an international focus; and 6) mandating foreign language proficiency as a graduation requirement (Engberg and Green, 2002).

The common strategies identified above are consistent with the key factors that Ellingboe (1998) described to develop internationalization. Those factors include: 1) college leadership; 2) the availability, affordability, accessibility, and transferability of study-abroad programs for students; 3) the presence and integration of international students, scholars, and visiting faculty into campus life; 4) international curriculum; 5) faculty members' international involvement in activities with challenges, research sites, and institutions worldwide; and 6) International co-curricular units (residence halls, conference planning centers, student unions, careers centers, cultural immersion, and language houses), student activities, and student organizations.

U.S. colleges and universities are making efforts toward internationalizing their programs in various ways. At the same time, there are common strategies that are adopted and practiced by the institutions as shown above. In the current study, I will

focus on these common internationalization strategies to measure and analyze the internationalization of higher education institutions in the U.S.

Current status of Internationalization

As the strategies for internationalization differ from institution to institution, the degree to which each institution is internationalized varies as well (Hser, 2003). While some institutions consider internationalization a relatively marginal activity as an interesting addendum to a predominantly regional or national focus of higher education, others regard internationalization as highly central to their work which permeates every aspect of institutional life (Qiang, 2003). Despite the rhetoric and the overall level of improvement in university student mobility, professionalization of the international offices, and increased number of international students, many outcomes connected to the internationalization efforts within the U.S. are not considered successful (Stohl, 2007; Hayward, 2000). According to Siaya and Hayward (2003), internationalization of higher education in the U.S. is far from promising because most institutions exhibited a low level of commitment to internationalization, as evidenced by the low percentage of institutions that included internationalization in their mission statement or as a priority in their strategic plan. Moreover, the researchers point out that the majority of students and faculty expressed support for international activities but failed to participate in these activities.

According to Hayward (2000), enrollments in foreign language courses have dropped from 16 percent in the 1960s to less than 8 percent in recent years. Only 6 percent of all language enrollments are in Asian languages, with less than 2 percent in Arabic and Hebrew combined. Only 3 percent of U.S. college students in 4-year

programs participate in study abroad each year , and those who participate are disproportionately White, female, middle-class, majoring in the humanities or social sciences, and choose European or English-language destinations (Hayward, 2000; NASULGC, 2004). Hayward concludes, “(m)ost graduates are ill-prepared to face the global marketplace of employment and ideas (p. 4)”. Hayward’s rather depressing remark is echoed by John Hudzik (2004) who lamented that “American higher education has failed to meet the challenges and opportunities of globalization, and the American public is ill-prepared.”

A survey of more than 750 colleges and universities nationwide conducted by the American Council on Education in 2001 also suggests that the gap between national rhetoric and institutional policies and practices is considerable (Green, 2005a, 2005b, 2005c, and 2005d). According to the survey results, around 75 percent of four-year institutions highlight their international education programs, activities, and opportunities in their student recruitment literature. However, only 40 percent of the same institutions identify international education as one of the top five priorities in their strategic plans. Moreover, only about 30 percent have formed a campus-wide committee or task force to work solely on advancing campus internationalization efforts. Additionally, the survey reveals that only 40 percent of the institutions required undergraduates to take courses focused on international perspectives, issues, or events as part of their general education requirement. In terms of the language requirements, only 23 percent had a foreign language entrance requirement, and 37 percent had a language requirement for all students in order to graduate. Lastly, only 4 percent of the

institutions surveyed maintain guidelines that specify international work or experience as a consideration in faculty promotion and tenure decisions.

On the whole, the literature indicates that the current status of internationalization in U.S. higher education is discouraging. Despite the low profile of internationalization, however, a number of studies examined the variation of internationalization among different institutions by assessing the degree of which the institutions are internationalized. Some selected studies are reviewed in the following section, focusing on the methodology used to assess internationalization.

Assessing internationalization

There are two different approaches to assessing internationalization in the literature: quantitative and qualitative. The quantitative approach allows for institutional comparisons by specifying the degree to which an institution is internationalized. Therefore, this approach utilizes measurable indicators to assess internationalization (Lian, 2003; Snellman, 1995; Horn, Hendel, and Fry, 2007). For example, Horn, Hendel, and Fry (2007) utilized 19 indicators of internationalization in their study to assess the international dimension of U.S. research universities. The researchers identified the indicators in the areas of student characteristics, faculty and scholars characteristics, research and grants, curriculum, and institutional characteristics. Data for each indicator was collected from various resources such as institutional websites, the Integrated Postsecondary Education Data System, and the Center for Advanced Research on Language Acquisition.

Many assessment studies with quantitative approach utilize the survey method as well, to gather data. ACE's most recent research, which surveyed U.S. higher

education institutions to explore the extent of institutional commitment to internationalization and the strategies used to promote internationalization, is a good example (Green, 2005a, 20005b, 20005c, and 20005d). The survey contained questions regarding the extent of the institutions' international activities, funds to support such activities for both faculty and students, and stated commitment to internationalization. The completed surveys were analyzed to generate the scores or "internationalization index" for each institution. Overall, the internationalization index enables comparisons among similar institutions and allows individual institutions to compare their own practices and policies with those of their peers.

Unlike the quantitative approach, qualitative approaches are used for self-improvement, instead of comparisons with other institutions (Knight, 2002). Therefore, the results of institutional compliance to internationalization evaluated with a qualitative approach usually remains confidential (Horn, Hendel, and Fry, 2007). De Wit (2002) outlines several assessment efforts such as 1) the use of professional codes of practice by numerous education organizations in the United Kingdom (UKCOSA), Canada (CBIE), Australia (AVCC), and the United States (NAFSA); 2) the certification process assessing the quality of transnational education designed by The Global Alliance for Transnational Education (GATE); 3) Total Quality Management; 4) ISO 9000 guidelines, 5) the process of benchmarking, and 6) the International Quality Review Process (IQRP). Among these various efforts, IQRP utilizes a self-assessment exercise and an external peer review which focus on the institution's stated policies for internationalization, the integration of an international dimension into the overall

institution system, and the inclusion of internationalization as a “key theme” within the system (Knight, 2002).

The field of internationalization has been developed based on different needs and rationales, depending on the current national and international trends. The variability of the term, internationalization, is clearly evidenced in its definitions and strategies. Even though the current status of internationalization in the U.S. is not satisfactory, there have been many efforts made to improve the status of internationalization by assessing to the degree which U.S. higher education institutions are internationalized. The next section discusses the issues in quality of higher education focusing on historical development, definitions, and assessment.

Quality of Higher Education

According to Harvey and Green (1993, p. 1), quality is a burning issue in the field of higher education throughout the world because: 1) business demands high quality services; 2) higher education institutions compete intensely for top faculty, best students, and research grants; 3) quality of higher education matters to the government in terms of its international reputation; and 4) quality is often linked with cost effectiveness, which is a key word in the analysis of higher education. The current literature divides the quality issues into two distinct, but not mutually exclusive areas: accountability and academic quality. The following section deals with the various aspects of these two areas, focusing on the U.S. higher education system.

Historical Perspectives

In the late 1970s through the 1980s, the accountability movement emerged within U.S. public higher education (Davis, 2003). During that period, the public

perceived that the quality of undergraduate education in the U.S. was declining (Davis, 2003; Dill, 2003a). Public perception toward the low quality of higher education led state policymakers to mandate public institutions to assess the amount and quality of student learning (Davis, 2003). At first, this assessment was viewed as a tool for institutional improvement (Ibid). However, the national economic downturn and the state governments' funding cutbacks in the early 1990s forced the higher education institutions to compete more aggressively with other state services for the state budget (Ibid). As a result, the assessment results were used to demonstrate higher education institutions' accountability and efficiency (Bogue, Creech, and Folger, 1993).

Even though the assessment movement reduced concerns regarding the quality of higher education, the external stakeholders of higher education still had a skeptical view towards higher education institutions' capacity to regulate themselves (Davis, 2003; Dill, 1997). This skepticism reinforced accreditation agencies to include more criteria requiring all colleges and universities to assess student learning and institutional improvement (Dill, 2000). As a result, 'Performance Indicators' (PINS), a new mechanism to provide various stakeholders with "quick and understandable information" about institutions' effectiveness and accountability were developed and widely used in the U.S. (Ibid, p. 18). Regardless of the initial purpose of PINS, however, pressure for accountability within higher education institutions has led policymakers to increasingly connect PINS results to higher education funding – so called performance funding (Burke, 1997). In the field of higher education, performance funding is in tremendous debate in terms of its effectiveness and its impact on institutions.

While accountability has been, and is, the central quality issue of higher education, pure academic quality is another field of interest for many stakeholders. According to Dill (2003b), academic quality as a new form of evaluating universities was first initiated in France in the early 1980s; more fully elaborated in the U.K. in the late 1980s; and has been spread around the world since then. By the year of 2000 almost all of the European Union countries as well as many countries in Africa, Asia, and South America and a number of the U.S. states were experimenting with new forms of academic quality regulation (Ibid, p. 1). Dill (2003b) asserts that society's interest in academic quality is in "assuring and improving academic standards in research and student learning" (p. 4). In this context, the term, 'academic standards' is related to student learning outcomes, including "the specific levels of knowledge, skills, and abilities that students achieve as a consequence of their engagement in a particular college or university program" (Dill, 2003b, p. 4.).

Originally, the interests in quality of education started within the academy and the public, with studies conducted by and for university leaders and government officials. However, a number of current assessments take the form of rankings and ratings designed by commercial media, driven by profit motives, and targeted to prospective students and parents (Brooks, 2005). Even though these are used pragmatically by the consumers to select the colleges or universities of 'good quality', there are many debates about whether the commercial rankings and ratings represent the quality of higher education institutions at all. Above all, however, the more serious question is "after decades of assessment research, does the higher education community have a better sense of what university quality is?" (Brooks, 2005, p. 1)

Definitions of quality

Quality is a philosophical concept, which results in various definitions and conceptualizations reflecting different perspectives of the individual and society (Harvey and Green, 1993; Harvey and Newton, 2004). According to Harvey and Green (1993), quality is both a relative and absolute term. From the relative perspective, most ideas about quality are value related and judgmental. In addition, quality means different things to different people. As a result, the relative term of quality raises the issue of ‘whose quality?’ because there are a variety of stakeholders in higher education, including students, parents, employees, teaching and non-teaching staff, governments and their funding agencies (Middlehurst, 1992; Burrows and Harvey, 1992). On the contrary, the absolute perspective supports that quality is self evident and uncompromising. Therefore, quality is judged based on absolute criteria that have to be exceeded to obtain a quality rating (Harvey and Green, 1993).

The most commonly cited definitions of quality in the literature are Harvey and Green’s (1993) five distinct, but abstract and interrelated conceptualizations: exceptionalism, perfection, fitness for purpose, value for money, and transformative. First, quality as exceptionalism is viewed as something excellent. In this perspective, an institution that takes the best students and provides them with the best resources is thought to be excellent, regardless of the process. Therefore, quality as exceptionalism is judged by the reputation of the institution and the level of its resources (Astin, 1990).

Second, quality as perfection is considered to be something flawless. This perspective of quality also means that the delivery of goods and services are consistent. Some researchers, however, argue that this conceptualization should be removed from

Harvey and Green's definitions of quality because higher education in the U.S. does not aim to produce standardized graduates with zero defects (Watty, 2003; Lategan, 1997).

Third, quality as fitness for purpose is regarded as something fulfilling the purposes defined by stakeholders. In this approach, quality is judged in terms of the extent to which the product or service fits the purpose or mission of the stakeholders. Even though this approach is extensively used to define the quality of higher education (De Wit, 1997), there are two issues raised by it as well. First, it is difficult to recognize the appropriate stakeholder group among many who can determine the quality of education. Second, it is hard to define the purpose of higher education because different stakeholders in higher education may have different views about the purpose of higher education.

Fourth, quality from the perspective of value for money is seen as something beneficial relative to cost. This concept is related to the demand in the public sector for efficiency and effectiveness (Joseph, 1986; Cave, Kogan, and Smith, 1990). Therefore, at the heart of the value-for-money approach is the notion of accountability (Kogan, 1986). Generally, performance indicators are used to monitor the accountability of higher education institutions in the perspective of value for money.

Finally, quality in the transformative perspective is about enhancing and empowering the learners as well as improving the learning process. This approach measures quality in terms of the extent to which the educational experience enhances the knowledge, abilities and skills of students. This approach also involves empowering students to influence their own transformation through student evaluation or developing critical thinking ability. This empowerment is expected to effect students for life.

Besides Harvey and Green's (1993) conceptualizations of quality, there are other significant definitions either supported or debated by different researchers. Astin (1985) argues that quality of higher education is defined in terms of four different meanings: reputational ratings, available resources, student outcomes, and talent development or value added. The first two meanings are closely related to the concept of quality as exceptionality by Harvey and Green (1993). In the current literature, however, reputation and resources are not considered to be effective quality indicators because they do not consider the learning process. Astin (1985) argues student outcomes are problematic in judging quality as well, because there is little agreement about desired outcomes and the methods for assessing them. The fourth meaning, talent development or value added, is concerned about the specific levels of knowledge and abilities obtained by students through attending a particular college or university program (Pascarella, 2001; Astin, 1985). In this regard, value added is clearly related to Harvey and Green's (1993) transformative perspective in its nature. Astin (1985) considers value added most highly among other meanings because this approach truly measures students' learning experiences in university or college, and also provides consistent results when measuring quality of various institutions with different academic standards. Unfortunately, no literature has provided information on how to measure the value added. This discrepancy is a hurdle for conducting research in measuring quality of education.

Bergquist (1995) defines quality using four sets of criteria: input, output, value-added, and process-oriented. First, input criteria indicate the nature and extent of resources available to the institutions, including characteristics of incoming students,

faculty credentials, size of libraries, physical facilities, and financial reserves. The input criteria are similar to the quality as exceptionality by Harvey and Green (1993) and resources criteria by Astin (1985). Second, output criteria indicate the nature and extent of institutional products, including graduating student characteristics, alumni success, research and scholarly publications, and public service. The output criteria are similar to student outcomes criteria by Astin (1985). Third, value-added criteria mean differences that the institution has made in the growth of all members of the institution, including intellectual, moral, social, vocational, physical, and spiritual development. Finally, process-oriented criteria denote level and manner of participation by all appropriate stakeholders of higher education institutions. The value added and process-oriented criteria are similar to the quality in transformative perspective by Harvey and Green (1993) and talent development and value-added criteria by Astin (1985).

Cleary (2000) investigated multiple stakeholder groups' opinions about which types of quality indicators, among inputs, processes, outputs, and outcomes, are viewed to best capture the provision of quality at a medium-sized community college. The study findings revealed that the stakeholder groups such as students, faculty members, and staff perceived outcome measures to be more relevant and appropriate than the others in regard to defining institutional quality. The outcome indicators identified by the stakeholder groups in the study include customer/client satisfaction, student achievement, and student skill improvement. These outcome indicators, however, are viewed as more related to the value added aspect of the quality of education.

Burrows, Harvey, and Green (1992) conducted a project in 1992 in the U.K to study employers' views on quality of higher education. According to the researchers,

employers judge quality in terms of the extent to which higher education produces future employees with both subject-specific knowledge and skills, and transferable skills. In this context, transferable skills mean “generic capabilities which allow people to succeed in a wide range of different tasks and jobs” beyond the class settings (Ibid, p. 2). Given the rapidly changing nature of industry, employers are looking for higher education graduates who can learn new knowledge and skills quickly and adapt to different situations appropriately. Harvey, Geall, and Moon (1997, p. 7) further argue that employers want employees who can be ‘adaptive’ (readily fit in to the workplace), ‘adaptable’ (use their initiative to develop new ideas) and ‘transformative’ (help the organization evolve by inspiring others and leading changes). In order for graduates to be ‘adaptive’, ‘adaptable’ and ‘transformative,’ higher education needs to develop a set of attributes that employers see as desirable within graduates and to ensure that their curriculum address the needs for the students in this regard.

As seen in this section, quality of higher education is defined in a number of different ways. Despite the variability, it is noticeable that there are also common themes agreed among researchers in the field. For example, even though reputation and resources are commonly used to represent the quality of education in practice, a number of researchers argue that those two factors fail to define quality because of their lack of relevance to students’ learning experiences. Overall, researchers believe that quality should be defined based on students’ learning experiences, learning outcomes, and value added. As there are different ways to define quality, there have been empirical efforts to measure the quality of education to compare institutions’ differences and/or to

enhance self-improvement. The next section reviews the various issues of quality assessment.

Quality Assessment

Before discussing quality assessment, it is relevant to distinguish the term quality assessment from other quality related terms such as quality assurance, quality control, quality audit, and Total Quality Management (TQM). Quality assessment is “the process of external evaluation of the quality of teaching and learning in higher education” (Patrick and Stanley, 1998, p. 20). Quality assurance refers to “the policies, systems, and processes directed toward ensuring the maintenance and enhancement of the quality” in higher education (Ibid). Quality control is a term used to describe “the operational techniques or systematic procedures” (Ashworth and Harvey, 1994, p. 7) carried out to verify that teaching and learning take place in a satisfactory manner (Patrick and Stanley, 1998). Quality audit is “the process of ensuring that the quality control arrangements in an institution are satisfactory” (Patrick and Stanley, 1998, p. 20). Total Quality Management (TQM) is a “system that seeks to realign the mission, culture, and working practices of an organization by means of pursuing continued quality improvement” (Ashworth and Harvey, 1994).

Reputation and resource models have commonly been utilized as tools for measuring institutional quality (Ruben, 1995; Seymour, 1992; Sims and Sims, 1995). Reputational ratings along with institutionally reported data have been used to produce institutional rankings by magazines or college guide publishers, such as *U.S. News and World Report*, *Money magazine*, and others. The published rankings are widely used by parents and students as tools for comparing institutional quality and determining

preferred institutions. However, a number of scholars argue that the institutional rankings and reputations do not convey the quality of higher education because the criteria employed are irrelevant to the core meaning of quality (Jones, Lindzey, and Coggeshall, 1982; Astin, 1985; Pascarella, 2001; Ruppert, 1995; Dometrius, Hood, Shirkey, and Kidd, 1998; Hossler, 2000; Donald and Denison, 2001; Brooks and June, 2002; Dey, Hurtado, Rhee, Inkelas, Wimsatt, and Guan, 1997; NPEC 2000).

One of the quality assessment processes in the U.S. is through institutional accreditation performed by six regional accrediting agencies (Dill, 2003b). The role of institutional accreditation is to provide evidence that institutions or programs meet specified minimum requirements and criteria, and to encourage institutional quality improvement (Patrick and Stanley, 1998). Accreditation processes normally utilize a combination of performance indicators, self study, and peer review, but do not lead to a ranking of institutions or programs (Dill, 2003b; Patrick and Stanley, 1998). Even though the institutional accreditation system is widely implemented in the U.S., it is perceived as inefficient to assure academic quality, because it fails to address the students' learning outcomes (Patrick and Stanley, 1998). In general, institutional accreditation is thought to be too comprehensive in its scope and not systematically reviewing the academic experience of students (Dill, 2003b). Furthermore, accreditation practice is considered to be overly costly, requiring too much administrative and faculty time, while providing little information on added value (Ibid).

Recently, more emphases have been placed on assessing the outcomes of college education including student learning and development (Bennett, 2001; Patrick and Stanley, 1998; Haworth and Conrad, 1997; Gray and Banta, 1997). Some outcome

indicators include program or degree completion rates, retention rates, the proportion of undergraduates admitted to graduate education, and alumni satisfaction ratings (Donald and Denison, 2001; Bennett, 2001). Despite the increased emphasis on outcome assessment, there are concerns regarding whether the outcome indicators actually measure the true outcomes of student learning experiences. According to Brooks (2005), many assessments fail to capture the multidimensional facets of quality because they often favor one aspect of a university's activities as a standard of quality. For example, retention rates imply "what percentage of an institution's students were satisfied enough to continue at a college, and what percentage received the benefit of the institution's full program" (Bennett, 2001, p. 4). However, the retention rates fail to provide information about what students actually learned or attained while attending a college or university (Ibid). Supporting Brooks' argument, Chun (2002) also maintains that some indicators fail to measure student learning because those indicators tend to measure what is easier to measure instead of what should actually be measured.

In an attempt to avoid being narrow-sighted, many institutions and researchers use multiple indicators reflecting inputs (resources), processes (student experiences and institutional practices), and outcomes to assess institutional quality (Quality Indicators Group, 1988). Even though recent discussions about assessment in higher education have focused on the need for more outcome assessments, the Quality Indicators Group (1988) emphasizes that all three variables should be included in a comprehensive set of quality indicators, because looking at outcome measures has value only if the inputs and process to achieve particular outcomes are simultaneously taken into account. Ashworth and Harvey (1994) also list quality indicators including staffing, accommodation,

equipment, teaching and learning, standards achieved, and management and quality control. Among these, staffing, accommodation, and equipment are related to inputs. Teaching and learning are related to process. Standards achieved are related to outcomes.

Another approach to assess quality of higher education is through student surveys asking students directly about their collegiate experiences, satisfaction with their coursework and school, improvement in their academic abilities, and educational as well as employment plans (Chun, 2002). The National Survey of Student Engagement (NSSE), an annual student survey designed to assist colleges and universities in enhancing student learning, is a good example (Kuh, 2001). NSSE attempts to assess the extent to which students from the participating colleges and universities are associated with learning and development.

According to Chun (2002), the student survey approach is based on the assumption that students can describe their current abilities and learning gains or improvements over time. While individual institutions collect such data to gather feedback about their institution, researchers collect data nationally from a number of institutions to study the effects of higher education in general as well as between-college impacts (NCHEMS, 1994). Moreover, such self-reported information is used in an attempt to assess institutional effectiveness (Astin, 1993; Pace, 1990; Terenzini and Wright, 1987). Although student surveys can be and have been used in an attempt to link educational quality with student learning, Chun argues (2002) that their use is problematic in assessing student learning because of the indirect measure of learning given the reliance on student self-assessment.

The flaw in some of the approaches discussed above is that they do not suggest how improvements in quality of learning could be made (Donald and Denison, 2001). In order to assess the quality of higher education, a number of researchers argue that what students actually learned or attained as a consequence of attending a college or university has to be assessed. Approaching this issue, direct assessment of student learning is another way of measuring quality. Some direct assessment methods include “analyzing course grades, administering standardized tests, performance tasks, and special multiple-choice or open-ended tests to assess general academic skills or subject matter knowledge; and obtaining data from other measures, such as evaluations of student projects, portfolios of student work” (Chun, 2002, p. 23).

Although the direct assessment approach may seem to be the most obvious way to assess the quality of higher education, the use of direct measures of student learning is uncommon. According to Chun (2002), the reasons for the rare use of direct assessment include 1) being cost-prohibitive to implement; 2) obstacles to making institutional comparisons; and 3) the difficulties in having institutions agree on what should be measured.

As mentioned earlier, quality is a burning issue in the field of higher education throughout the world (Harvey and Green, 1993). In the U.S., almost all the higher education institutions are making tremendous efforts to enhance their quality of education. Since there are numerous ways of defining quality, there also are a number of ways to improve and measure the quality of education. Throughout the literature, researchers clearly denounce reputation and resources as quality attributes. However, the literature also shows that various stakeholders of higher education, including the

institutions themselves, use reputation and resources to measure and rank the quality of higher education institutions. The following section discusses various issues regarding college rankings.

Summary

This chapter reviewed the literature on the various issues of internationalization and quality of higher education. Even though the topic of this study is the relationship between internationalization and quality of higher education, there were nearly no resources available that directly addressed the research topic. Thus, the first section examined the historical development, rationales, definitions, strategies, and assessment of internationalization of higher education. The second section explored the historical perspectives, definitions, and assessment issues of quality of higher education. The next chapter discusses the research methods including research design, data sources, population and sample, study variables, and data analysis process.

CHAPTER 3. METHODOLOGY

Introduction

The purpose of the study is to investigate the relationship between internationalization and quality of higher education. Chapters One and Two described the problems under study, significance of the research, relevant literature, and theoretical framework. This chapter provides additional information on the study methods including research design, data sources, population and sample, the study variables, the regression models, the study hypotheses, and data analysis.

Research design

This study employed a cross-sectional and quantitative analysis of the relationship between internationalization and quality of higher education, using the simple correlation study and the multiple regression analysis. The simple correlation study was necessary to answer the first research question: ‘What is the relationship between internationalization and quality of higher education?’ Since the first research question is concerned with two variables that may or may not relate in this study, the study needed to find out the Pearson-Product Moment correlation coefficient (r), which determines the direction and the magnitude of relationship between two variables (Gall, Gall, and Borg, 2003). In addition, the square of a correlation coefficient yields the explained variance (r^2) that tells how much percent one variable explains the variance in the other variable (Ibid).

For the second research question, “To what extent and in what ways are internationalization variables related to quality variables?” I used the multiple regression analysis to examine the relationships among the dependent variables (quality

variables) and the independent variables (internationalization variables). In other words, the multiple regression analysis was used to predict the variance in a dependent variable based on linear combinations of independent variables (Howell, 2002). The quality variables were considered as dependent variables because the purpose of the second research question is to examine if internationalization variables have any significant and positive effects on quality variables, as is assumed in academic rationale (Knight, 1997).

Data sources

The data for the study were drawn from three different sources: 1) Lombardi et al's (2005) report, *The Top American Research Universities*; 2) Horn, Hendel, and Fry's (2007) study, *Ranking the International Dimension of Top Research Universities in the United States*; and 3) *the U.S. News and World Report (USNWR)'s America's Best Colleges 2003*. Although these datasets were collected for different purposes, they provided rich potential sources of data for this research. Each set contained data on U.S. higher education institutions, with identifiers that enabled me to link the datasets to create an analytic file for the study. Even though all three articles were published at different times, their data represent the similar time period of 2003-2005.

Following is more specific information on each data source.

The datasets in the Lombardi et al's report, *The Top American Research Universities* (2005) provide comprehensive information on the nine performance indicators for 87 U.S. research universities (53 public and 34 private universities). The authors identified the 87 research universities by 1) their federal research activities that have more than \$20 million in annual federal research expenditures in fiscal year 2003;

and 2) their rank on the nine performance indicators (Lombardi et al, 2005, p. 43). According to Lombardi et al (2003), the most useful measures of a university's competitiveness mark "the institution's success in securing quality research, a quality student body, and quality faculty" (p. 18). Based on the core characteristics of highly performing research universities, the researchers identified nine indicators grouped into five categories as shown in Table 1. Table 1 also shows the data sources used by the researchers.

Table 1

Categories, Indicators, and Data Resources for Research Universities' Competitiveness Identified by Lombardi et al (2005)

Category	Indicators	Data Sources
Research Competitiveness	1. Total research expenditures	National Science Foundation (NSF)/Science and Engineering Statistics (SRS) Survey of R and D Expenditures at Universities and Colleges, FY 2003
	2. Federal research expenditures	National Science Foundation (NSF)/Science and Engineering Statistics (SRS) Survey of R and D Expenditures at Universities and Colleges, FY 2003
Private Support	3. Endowment assets	National Association of College and University Business Officers (NACUBO) Endowment Study as reported in <i>The Chronicle of Higher Education</i> , endowment market value as of June 30, 2004
	4. Annual giving	Council for Aid to Education's Voluntary Support of Education (VSE) Survey, FY 2004

Table 1 (Continued)

Category	Indicators	Data Sources
Faculty Distinction	5. Faculty members in the National Academies	National Academy of Sciences, National Academy of Engineering, and Institute of Medicine membership directories for 2004
	6. Faculty awards in the Arts, Humanities, Science, Engineering, and Health	Directories or Web-based listings for multiple agencies or organizations
Advanced Training	7. Doctoral degrees	The National Center for Education Statistics (NCES) Integrated Postsecondary Education Data System (IPEDS) Completions Survey, doctoral degrees awarded between July 1, 2001, and June 30, 2004.
	8. Postdoctoral appointees	NSF/SRS Survey of Graduate Students and Postdoctorates in Science and Engineering, Fall 2003
Undergraduate Quality	9. Entering freshmen SAT scores	The Annual Survey of Colleges of the College Board and Data Base, 2004-05.

Lombardi et al (2005) used measures that identify institutional performance relevant for a top research university. I could imagine other measures as well, such as students' learning outcomes and value added, but in most cases, the data for more complex evaluations did not exist in a reliable form. I chose the datasets used by Lombardi et al (2005) for several reasons: 1) Although imperfect, the measures used in the report can be used as quantifiable indicators of quality of higher education; 2) the report is based on objective data; and 3) research universities have actually used the ranking identified by Lombardi et al. in their marketing and institutional strategic planning processes.

Horn, Hendel, and Fry (2007)'s study, *Ranking the International Dimension of Top Research Universities in the United States* attempts to measure internationalization of 77 U.S. research universities. The authors utilized the same research universities identified in Lombardi et al's report, excluding two institutions that do not provide undergraduate programs and eight institutions with missing data. Based on the literature review and the process of reducing data complications, the authors created 19 indicators grouped into five categories as shown in Table 2.

Table 2

Categories, Indicators, and Data Sources for Research Universities'

Internationalization Identified by Horn, Hendel and Fry (2007)

Category	Indicators	Data Sources
Student Characteristics	1. Percentage of international students on campus	IPEDS database
	2. Number of Marshall and Rhodes scholars	Respective website
	3. Number of student Fulbright Fellows	Fulbright website
	4. Number of Peace Corps volunteers	Peace Corps Database
	5. Percentage of study abroad participants	IPEDS database
	6. Percentage of foreign language graduates	IPEDS database
Faculty and Scholar Characteristics	7. Number of faculty who have been Fulbright scholars	Fulbright website
	8. Number of Fulbright scholars from other countries	Fulbright website

Table 2 (Continue)

Category	Indicators	Data Sources
Faculty and Scholar Characteristics	9. Percentage of international faculty, instructors, and research associates on campus	IPEDS database
	10. Number of Title VI centers	U.S. Department of Education's website
Research and Grants	11. Number of Ford Foundation grants	Ford Foundation Website
	12. Number of FIPSE international education grants	FIPSE database
	13. Number of campus centers focused on international research.	Institutional websites
Curriculum	14. Number of Least Commonly Taught Languages (LCTL)	Database hosted by the Center for Advanced Research on Language Acquisition (CARLA) at the University of Minnesota
	15. Language requirements for the bachelor's degree	Institutional websites
	16. International perspective requirements for the bachelor's degree	Institutional websites
Institutional Characteristics	17. Visibility of international content on institutions' websites	Institution's home page on website
	18. Presence of a senior administrator for international activities	Institution's home page on website
	19. Number of books in the university library's international collection	WorldCat database

Horn, Hendel, and Fry (2007) constructed the weights for each indicator from a panel of eight experts in the field of internationalization of higher education in the U.S. aiming to add the practical strengths to the study. After that, the authors calculated the internationalization index scores for each institution based on the institution-specific data for 19 indicators and weights derived from the panel of experts. Finally, the authors rank ordered the institutions using the internationalization index scores.

I chose Horn, Hendel, and Fry (2007)'s research because: (a) this is the only research in the field that created a set of indicators to measure internationalization; and (b) the researchers measured the internationalization indicators for 77 research universities identified in Lombardi et al.'s (2003) report. I did not use the weights identified in the Horn, Hendel, and Fry (2007)'s study because other datasets I used for my study did not employ the weights system. Hence, with the authors' permission, I calculated the internationalization index scores based on the unweighted data.

The *U.S. News and World Report (USNWR)* produces college rankings annually based on a number of indicators in the areas of academic reputation, student selectivity, faculty resources, retention rates, financial resources, alumni giving, and graduation rate performance. Table 3 provides information on the ranking categories and their weights as well as indicators for each ranking category and indicator weights. As seen in Table 3, institutional reputation as a ranking category and a single indicator is weighed highest (25%), which shows *USNWR*'s priority in judging an institution's quality of education.

Table 3

Categories, Indicators, and Weight in U.S. News and World Report for the 2000 College Rankings^a

Ranking Category	Category Weight	Indicator	Indicator Weight
Institutional Reputation	25%	1. Academic Reputation Survey	100%
Student Selectivity	15%	2. Acceptance Rate	15%
		3. Yield	10%
		4. High School Standing— Top 10%	35%
		5. SAT/ACT Scores	40%
Faculty Resources	20%	6. Faculty Compensation	35%
		7. Faculty With Top Terminal Degree	15%
		8. Percent Full-time Faculty	5%
		9. Student/Faculty Ratio	5%
		10. Class Size, 1-19 Students	30%
		11. Class Size, 50+ Students	10%
Retention Rate	20%	12. Average Graduation Rate	80%
		13. Average Freshmen Retention Rate	20%
Financial Resources	10%	14. Educational Expenditures Per Student	100%
Alumni Giving	5%	15. Alumni Giving Rate	100%
Graduation Rate Performance	5%	16. Graduation Rate Performance	100%

Source: Clarke (2002)

^aThese indicators and weights are for the national liberal arts and national university rankings only.

USNWR is generally regarded as the most authoritative and commercially successful of all college rankings (Webster, 1992; McDonough, Antonio, Walpole, and Perez, 1998). *USNWR* places schools into different categories such as mission, region, and type of education so that colleges within each category are ranked separately (Clarke, 2002). Then, *USNWR* collects data from each school on various quality indicators mentioned above. Each indicator is assigned a pre-defined weight that reflects *USNWR*'s judgment about the importance level of selected quality indicators. Finally, *USNWR* standardizes and sums the data of each indicator to produce the overall scores for each school, which determine the college rankings.

For the purpose of the research, I used the academic reputation for a quality indicator because, although controversial, the reputation has been commonly used to represent the quality of education in practice (Astin, 1990; Ruben, 1995; Seymour, 1992; Sims and Sims, 1995). Moreover, some researchers maintain that reputation has a mutual relationship with quality and internationalization of higher education. According to Knight (2004), effectively internationalized institutions tend to gain national and international reputations which will attract more research opportunities and diversity on campus. Knight (2004) argues that the research opportunities and diversity on campus gained by reputation will eventually enhance the quality of higher education. Similarly, Biddle (2002) also maintains that if the university meets the challenge of internationalization, it would "enhance its visibility and stature internationally, and this in turn would put it in a stronger position to recruit international students and faculty, and develop collaborative partnerships with overseas universities" (p. 7).

Population and Sample

The population of the study is the U.S. research universities. Research universities are defined as doctorate-granting universities that are regionally accredited, compete for federal research funds, and award at least 20 doctoral degrees¹ per year (The Carnegie Foundation for the Advancement of Teaching, 2006). According to The Carnegie Foundation for the Advancement of Teaching (2006), there are 282 research universities in the U.S., which are divided into three different categories: 1) RU/VH: Research Universities with very high research activity; 2) RU/H: Research Universities with high research activity; and 3) DRU: Doctoral/Research Universities. The institutions are categorized depending on their relative levels of research activities.

Among the pool of 282 research universities, 77 institutions were selected for the study. As explained earlier, 87 institutions were identified by Lombardi et al (2003) that reported nine performance indicators and databases. Among these institutions, Horn, Hendel, and Fry (2007) selected 85 universities to identify 19 internationalization indicators and measure them. These 85 institutions became my sample units. Among them, 77 institutions were chosen because they were the only ones with the complete datasets. Beside the availability of the data, the pool of institutions was chosen because: (a) they included both public and private institutions; and (b) they were considered to constitute the most prominent set of research universities in the United States. See APPENDIX A for a complete list of the 77 institutions.

¹ Doctoral-level degrees that qualify recipients for entry into professional practice, such as the JD, MD, PharmD, DPT, etc. are excluded. Also, excluded are Special Focus Institutions and Tribal Colleges (The Carnegie Foundation for the Advancement of Teaching, 2007).

Specification of Variables

The first research question utilized two variables: internationalization and quality of higher education, while the second research question is concerned with a number of dependent and independent variables. Table 4 presents the list of the variables used in the study.

Table 4

A Chart of Study Variables

Research Questions	Variables
RQ1	<ol style="list-style-type: none">1. Internationalization2. Quality of higher education
	<u>Independent Variables (Internationalization Variables)</u> <ol style="list-style-type: none">1. International students2. U.S. study abroad3. Internationalized faculty and scholars4. International research activities5. Internationalized curriculum6. Organization support for internationalization
RQ2	<u>Dependent Variables (Quality Variables)</u> <ol style="list-style-type: none">1. Research competitiveness2. Faculty competitiveness3. Undergraduate competitiveness4. Advanced training competitiveness5. Financial stability6. Constituents' satisfaction7. Institutional reputation

Internationalization Internationalization of research universities is defined as “the process of integrating an international, intercultural or global dimension into the purpose, functions or delivery of post-secondary education” (Knight, 2003, p. 2). This definition is comprehensive enough to relate every possible international dimension to all aspects of higher education (Ibid). At the same time, the comprehensiveness of the definition makes it hard to measure internationalization and compare the results among institutions. In the current study, I calculated the internationalization index scores for each institution by summing the standardized scores of the 17 internationalization indicators used by Horn, Hendel, and Fry (2007). Originally, there were 19 indicators as shown in Table 2. However, Horn et al. (2007) combined the number of Ford Foundation grants with the number of FIPSE international education grants in their analysis. Also, the data on the visibility of international content on institutions’ websites were unavailable to use for this study. Hence, I calculated the internationalization index scores using only 17 indicators.

Quality of Higher Education The quality of higher education is defined as the extent to which the educational experience at a particular college or university program enhances the knowledge, abilities and skills of students (Harvey and Green, 1993; Astin, 1985) or the differences that the higher education institution has made in the growth of all members of the institution, including intellectual, moral, social, vocational, physical, and spiritual development (Bergquist, 1995). As in the case of internationalization, it is extremely difficult to fully measure quality of higher education. In the current study, I calculated the quality index scores for each sample institution by summing the standardized scores of the nine quality indicators used by

Lombardi et al (2005) and institutional reputation indicator used in *USNWR* (2003). See Table 1 and 3 for the quality indicators.

For the second research question, a set of independent variables and dependent variables were identified. Six independent variables included: 1) international students, 2) U.S. study abroad, 3) internationalized faculty and scholars, 4) international research activities, 5) internationalized curriculum, and 6) organizational support for internationalization (see Table 4). I have identified and measured these variables based on the 17 internationalization indicators developed and modified by Horn, Hendel, and Fry (2007). See Table 2 for more information on the indicators.

Seven dependent variables include: 1) research competitiveness, 2) faculty competitiveness, 3) undergraduate competitiveness, 4) advanced training competitiveness, 5) financial stability, 6) constituents' satisfaction, and 7) institutional reputation. I have identified and measured these variables based on the nine quality indicators developed by Lombardi et al (2005) and the indicator of institutional reputation used by *USNWR* (2003). See Table 1 and 3 for more information on the indicators.

It should be noted that some important attributes of educational quality such as student outcomes and output, learning experiences and value added are difficult to measure. No study has been conducted to measure those critical quality attributes, nor is it the purpose of the current study to measure them or create the testable indicators. Therefore, the quality variables identified above are used as proxy measures of quality in this study.

The following section specifies the independent and dependent variables included in the study. Each variable is described in some detail, and the collection methods are specified.

Independent variables

International Students An international student is defined as “anyone who is enrolled in courses at institutions of higher education in the U.S. who is not a U.S. citizen, an immigrant (permanent resident) or a refugee. These may include holders of F (student) Visas, H (temporary worker/trainee) Visas, J (temporary educational exchange-visitor) Visas, and M (vocational training) Visas” (Institute of International Education [IIE], 2007). According to Open Doors 2006, there were about 560,000 international students enrolled in U.S. higher education institutions in 2005-06. The presence of international students has been considered essential to achieve internationalization of higher education institutions (Knight and de Wit, 1997; Mestenhauser and Ellingboe, 1998). Horn, Hendel, and Fry (2007) measured the presence of international students by calculating the percentage of international students (both undergraduate and graduate) on campus using the IPEDS database to obtain 2001-02 data for total full-time undergraduate and graduate enrollment, and total full-time undergraduate and graduate international student enrollment. In the current study, I used the standardized scores of the percentage of international students on campus.

U.S. study abroad participants U.S. study abroad participants are defined as only “those students who received academic credit from a U.S. accredited institution of higher education after they returned from their study abroad experience²” (IIE, 2004).

² Students who travel and take courses without credit transfers or are enrolled overseas for degrees from non-U.S. institutions are not included in the Open Doors database (Open Doors, 2004).

According to IIE (2006), the number of U.S. study abroad participants has increased steadily and reached about 206,000 in 2005-06, which is about an 8% increase of the previous year.

The U.S. higher education institutions who want to internationalize their campus have put emphases on increasing the number of study abroad participants (ACE, 2002) because the students who studied abroad are believed to have not only international awareness and intercultural sensitivity (Jenkins and Skelly, 2004) but also intellectual and personal development (Cummings, 2001, Dwyer, 2004; Davis and Mellow, 2003). The percentage of study abroad participants was calculated using the number of 2001-02 undergraduate study abroad participants at each institution obtained by Open Doors (Horn et al, 2007). In the current study, I used the standardized scores of the percentage of U.S. study abroad participants.

Internationalized faculty and scholars The current literature supports that the faculty engagement is key to institutional transformation and successful internationalization because they directly impact the teaching, research and service missions of higher education institutions (Carter, 1992; Goodwin and Nacht, 1983; National Association of State Universities and Land Grant Colleges, 1993; Welsh, 1997; Bond, 2003; Cleveland-Jones, Emes, and Ellard, 2001; Welsh, 1997). In particular, faculty has the ability and authority to decide whether or not to incorporate international perspectives into their curricula, to draft grant proposals for international research, or to participate in international projects (Green and Olson, 2003). Therefore, international perspectives and experiences of faculty are essential sources to achieve the goal of internationalization.

Horn, Hendel, and Fry (2007) measured the international dimension of an institution's faculty and scholars using the number of U.S. faculty who has been Fulbright scholars; the number of Fulbright scholars from other countries; and the percentage of international faculty and scholars on campus (Horn, Hendel, and Fry, 2007). The authors obtained information pertaining to 2001-02 international Fulbright faculty and scholars from the Fulbright website. Also, the authors derived the 2001-02 number of full-time international staff occupied in instruction, research, or public service from the IPEDS database. I calculated the internationalized faculty and scholars by summing the standardized scores of the number of U.S. Fulbright scholars, the number of international Fulbright scholars, and the percentage of international faculty, instructors, and research associates on campus.

International research activities To evaluate the extent to which research activities conducted are focused on the international areas, Horn, Hendel and Fry (2007) collected data pertaining to the number of Title VI centers, the number of Ford Foundation grants for international research, the number of FIPSE international education grants, and the number of campus centers focusing on international research. The authors obtained the number of Title VI National Resource Centers and Foreign Language and Area Studies Fellowships Programs for Fiscal Year 2000 to Fiscal Year 2002 from the U.S. Department of Education's website. They also obtained information regarding 2002 Ford Foundation grants for international research and FIPSE international education grants (combined 2001 and 2002) from the corresponding websites. The authors obtained the number of campus research centers with an international concentration from each institutional website. I calculated the scores for

international research activities by summing the standardized scores of each dataset mentioned above.

Internationalized Curriculum Internationalized curriculum constitutes another dimension of internationalization, playing a significant role of developing graduates' intercultural competence (Biddle, 2002; Ellingboe, 1998; Harari, 1992). Horn, Hendel, and Fry (2007) measured internationalization of the curriculum through the number of Less Commonly Taught Languages (LCTL)³ offered on campus, non-English language credit requirements for the bachelor's degree, and international perspective credit requirements for the bachelor's degree. The authors obtained LCTL data through a database hosted by the Center for Advanced Research on Language Acquisition (CARLA) at the University of Minnesota-Twin Cities. Moreover, the authors obtained information pertaining to curricular requirements from each institution's website. I calculated the degree to which the curriculum is internationalized by summing the standardized scores of the datasets collected by Horn, Hendel, and Fry (2007)⁴.

Organizational Support for Internationalization Many researchers argue that administrative leadership is a crucial element for achieving the goal of internationalization (Goodwin and Nacht, 1991; Mestenhauser, 2000; Bartell, 2003). According to Siaya and Hayward (2003), the majority of research universities have strengthened administrative structures with international offices, upper-level administrators overseeing operations, and a range of funding programs for students and faculty.

³ LCTL is operationally defined by the Center for Advanced Research on Language Acquisition (CARLA) as all languages excluding German, Spanish, French, and English (Hendel et al, 2004).

⁴ I used LCTL and foreign language requirement data only because international perspective data were unavailable.

To measure organizational commitment and academic resources for internationalization, Horn, Hendel, and Fry (2007) collected data regarding the visibility of international content on institutions' websites, the presence of a senior administrator for international activities, and the number of books in the university library's international collection. According to the authors, they evaluated the institutions' home page to determine the level of visibility of international programs and activities based on the selected evaluation categories. Unfortunately, the visibility data were not available to use.

Horn, Hendel, and Fry (2007) used each institution's home page to identify the presence and level of a campus administrator in charge of international programs and services. In determining the level of administrative leadership, the authors used the following five-point scale: 1=No apparent administrator; 2= Department-level administrator for international programs and services noted; 3= Dean level position noted, often an academic unit responsible for international programs across the institution; 4=Vice-provost or similar position reporting to campus provost or similar position; and 5=Vice-presidential level position, typically part of the president's cabinet (p. 20). Horn, Hendel, and Fry (2007) also used the WorldCat database to obtain the number of books in the international collection of each university library. I calculated the level of organizational support for internationalization by summing the standardized scores of the two datasets mentioned above.

Described so far were six internationalization variables and the data collection methods used in the current study. Following is the description of the variables used to measure the quality of higher education. According to Lombardi et al (2001), quality

elements are scarce, and universities acquire them through competition against other institutions. As a result, competition for students, faculty, and research defines the performance of the research university; hence, the researchers argue that the most useful measure of a university's competitiveness is the institution's success in securing quality research, a quality student body, and quality faculty (Ibid). The majority of the quality variables in the current study were derived from Lombardi et al's (2001) report which originally intended to measure the institutional performance of research universities.

Research competitiveness Lombardi et al (2001) maintain that competition for research defines the research competitiveness of the research university. The authors measured the competition for research using the research expenditure of each university. According to the authors, the research expenditure reflects the judgment of the active scientific community on the faculty's research competitiveness at each institution and also indicates the effectiveness of the institution in supporting research (Ibid). I used the total research expenditures in 2003 including the federal and non-federal research expenditures as an indicator of research competitiveness.

Lombardi et al (2000) point out that the research expenditure is not a complete measurement of the university's research because the dollar amounts for total research expenditures do not reflect many other kinds of significant university research (p. 11). The data used in Lombardi et al (2005)'s report came from the National Science Foundation Annual Survey of Scientific and Engineering Expenditures at Universities and Colleges, which exclude non-science and engineering research in such fields as law, education, humanities, business, fine arts, and journalism (Lombardi et al, 2000, p. 11). Moreover, the research expenditure used in their study does not involve research

activities that compete in an external marketplace (Ibid). Despite the problems, the research expenditures serve as a good measure of an institution's overall commitment to and success in research because the numbers help us to understand the strength of each research university and provide an element for grouping institutions (Ibid, p. 12). I calculated the research competitiveness by obtaining the standardized scores of the total research expenditures in 2003.

Faculty competitiveness Teaching is one of the most important aspects of the research universities. Lombardi et al (2001) assert that quality of education is related to the quality of teaching performed by quality faculty. Therefore, it is extremely important to maintain a high quality body of faculty. To measure faculty competitiveness, Lombardi et al (2005) used the numbers of National Academy memberships and prestigious faculty awards in the field of the sciences, the humanities and social sciences, as well as most other fields of academic scholarship. I calculated the faculty competitiveness by summing the standardized scores of the above mentioned two variables in 2004.

Undergraduate competitiveness According to Lombardi et al (2001), the perceived quality of a university's undergraduate program depends on the quality of its student body. Therefore, while the research competition focuses on the acquisition of scarce faculty research talent, undergraduate programs compete for the limited number of top quality students (ibid). Lombardi et al (2001) asserts that the high quality of existing students attracts high-quality applicants, which enable the university to select an even higher-quality student body (Ibid). The researchers used the median SAT scores of the entering freshmen at each institution as an indicator of success in the

undergraduate competition. According to Lombardi et al (2005), the median SAT is relatively standard, while not a complete measure of student quality, because most institutions use it as part of the admission process, and it is also less influenced by differences in undergraduate population size or financial aid practices. I calculated undergraduate competitiveness of each institution by obtaining the standardized scores of the median SAT scores in 2003. For those institutions that used ACT instead of SAT as an admission requirement, I converted their ACT scores to SAT scores using “SAT–ACT Score Comparisons” table created by the College Board (2007).

Advanced training competitiveness Lombardi et al (2001) indicate that research universities not only produce research, but also make a major contribution to the education and training of the next generation of researchers, including doctoral students and postdoctoral appointees. Therefore, the researchers counted the number of doctorates awarded and the number of postdoctoral appointees as an indicator of a university’s commitment to advanced study. These measures serve as indicators of the strength of an institution’s graduate and post-graduate education and research training activities. Therefore, I calculated advanced training competitiveness by summing the standardized scores of the number of doctorates granted in 2004 and the postdoctoral appointees in 2003.

Financial stability According to Lombardi et al (2001), the institutions’ quality of higher education depends heavily on their ability to generate money because “(a)ll things being equal, the more money the university can invest effectively in the competition for quality, the better it will become” (p. 10). When a university has large amounts of revenue, the researchers argue that it can afford high quality faculty and

different research initiatives that will bring returns on the investment in the form of discoveries, publications, grants, contracts, and scholarly reputation (Ibid). Moreover, Lombardi et al (2001) point out that the large amounts of revenue allow universities to attract high quality student population by improving their learning environment such as facilities and student-teacher ratio. The bottom line argument is that the financial stability is strongly related to the quality of education in general. Lombardi et al (2005) used the amount of endowment as an indicator of financial stability because 1) endowment represents the university's permanent fund that constitutes to generate income each year; 2) endowment assets capture a stable and common element in the financial resources of all research universities, both public and private; and 3) endowment provides a significant source of revenue in support of research and quality education (Ibid). I calculated the financial stability of each institution by obtaining the standardized scores of endowment amounts in 2004.

Constituents' satisfaction Measuring constituents' satisfaction is another way to measure the quality of education because the better quality of education the university or college provides, the more satisfied the constituents would be with their institution. (Lombardi et al, 2000). Lombardi et al (2005) used the amount of annual giving to measure the constituents' satisfaction with higher education. In this context, annual giving includes the total gifts received by the university in the most recent years (Ibid). I calculated the constituents' satisfaction with the quality of higher education by obtaining the standardized scores of the annual giving amounts received in 2004.

Reputation USNWR's peer assessment scores in 2005 are used to measure the institutional reputation. According to the USNWR (2007), the peer assessment

survey allows the top academics they contact such as presidents, provosts, and deans of admission, to account for intangibles such as faculty dedication to teaching. Each individual is asked to rate peer schools' academic programs on a scale from 1 (marginal) to 5 (distinguished). Those who don't know enough about a school to evaluate are asked to mark "don't know". I obtained the standardized scores of the peer assessment results to calculate the institutional reputation for the study.

Data analysis

The computer software package, Statistical Package for Social Sciences (SPSS), was used for data management and analysis. Following is the specific information of the data analysis for the two research questions.

First Research Question

To address the first research question concerning the relationship between internationalization and quality of higher education, I conducted the simple correlation analysis using the overall internationalization index scores and the overall quality index scores for each research university. In addition, the square of a correlation coefficient was analyzed as the explained variance (r^2) to examine how much percentage internationalization explains the variance in quality of higher education. The null hypothesis for the first research question is as follows:

H_{01} : There is no relationship between internationalization and quality of higher education ($r = 0$).

Second Research Question

I conducted the multiple regression analysis to answer the second research question concerning the predictive value of the independent variables. I created seven

regression models shown below using six internationalization and seven quality variables to identify which aspects of internationalization elements predicted the quality indicators in the regression models. In the models below, β s are the beta weights which represent the relative predictive power of the independent variables (Howell, 2002).

$$Y_1 = \beta_{11}X_1 + \beta_{12}X_2 + \beta_{13}X_3 + \beta_{14}X_4 + \beta_{15}X_5 + \beta_{16}X_6$$

$$Y_2 = \beta_{21}X_1 + \beta_{22}X_2 + \beta_{23}X_3 + \beta_{24}X_4 + \beta_{25}X_5 + \beta_{26}X_6$$

$$Y_3 = \beta_{31}X_1 + \beta_{32}X_2 + \beta_{33}X_3 + \beta_{34}X_4 + \beta_{35}X_5 + \beta_{36}X_6$$

$$Y_4 = \beta_{41}X_1 + \beta_{42}X_2 + \beta_{43}X_3 + \beta_{44}X_4 + \beta_{45}X_5 + \beta_{46}X_6$$

$$Y_5 = \beta_{51}X_1 + \beta_{52}X_2 + \beta_{53}X_3 + \beta_{54}X_4 + \beta_{55}X_5 + \beta_{56}X_6$$

$$Y_6 = \beta_{61}X_1 + \beta_{62}X_2 + \beta_{63}X_3 + \beta_{64}X_4 + \beta_{65}X_5 + \beta_{66}X_6$$

$$Y_7 = \beta_{71}X_1 + \beta_{72}X_2 + \beta_{73}X_3 + \beta_{74}X_4 + \beta_{75}X_5 + \beta_{76}X_6$$

X_1 : International students

X_2 : U.S. study abroad

X_3 : Internationalized faculty and scholars

X_4 : International research activities

X_5 : Internationalized curriculum

X_6 : Organizational support for internationalization

Y_1 : Research competitiveness

Y_2 : Faculty competitiveness

Y_3 : Undergraduate competitiveness

Y_4 : Advanced training competitiveness

Y_5 : Financial stability

Y_6 : Constituents' satisfaction

Y_7 : Institutional Reputation

Based on the seven regression models, I posed the following 42 null hypotheses

H_{02} : International students have no effect on the research competitiveness.

H_{03} : U.S. study abroad has no effect on the research competitiveness.

H_{04} : Internationalized faculty and scholars have no effect on the research competitiveness.

H_{05} : International research activities have no effect on the research competitiveness.

H_{06} : Internationalized curriculum has no effect on the research competitiveness.

- H_{07} : Organizational support for internationalization has no effect on the research competitiveness.
- H_{08} : International students have no effect on the faculty competitiveness.
- H_{09} : U.S. study abroad has no effect on the faculty competitiveness.
- H_{010} : Internationalized faculty and scholars have no effect on the faculty competitiveness.
- H_{011} : International research activities have no effect on the faculty competitiveness.
- H_{012} : Internationalized curriculum has no effect on the faculty competitiveness.
- H_{013} : Organizational support for internationalization has no effect on the faculty competitiveness.
- H_{014} : International students have no effect on the Undergraduate competitiveness.
- H_{015} : U.S. study abroad has no effect on the Undergraduate competitiveness.
- H_{016} : Internationalized faculty and scholars have no effect on the Undergraduate competitiveness.
- H_{017} : International research activities have no effect on the Undergraduate competitiveness.
- H_{018} : Internationalized curriculum has no effect on the Undergraduate competitiveness.
- H_{019} : Organizational support for internationalization has no effect on the Undergraduate competitiveness.
- H_{020} : International students have no effect on the advanced training competitiveness.
- H_{021} : U.S. study abroad has no effect on the advanced training competitiveness.
- H_{022} : Internationalized faculty and scholars have no effect on the advanced training competitiveness.
- H_{023} : International research activities have no effect on the advanced training competitiveness.
- H_{024} : Internationalized curriculum has no effect on the advanced training competitiveness.
- H_{025} : Organizational support for internationalization has no effect on the advanced training competitiveness.
- H_{026} : International students have no effect on the financial stability.
- H_{027} : U.S. study abroad has no effect on the financial stability.
- H_{028} : Internationalized faculty and scholars have no effect on the financial stability.
- H_{029} : International research activities have no effect on the financial stability.
- H_{030} : Internationalized curriculum has no effect on the financial stability.
- H_{031} : Organizational support for internationalization has no effect on the financial stability.
- H_{032} : International students have no effect on the constituents' satisfaction.
- H_{033} : U.S. study abroad has no effect on the constituents' satisfaction.

- H_{034} : Internationalized faculty and scholars have no effect on the constituents' satisfaction.
- H_{035} : International research activities have no effect on the constituents' satisfaction.
- H_{036} : Internationalized curriculum has no effect on the constituents' satisfaction.
- H_{037} : Organizational support for internationalization has no effect on the constituents' satisfaction.
- H_{038} : International students have no effect on the reputation.
- H_{039} : U.S. study abroad has no effect on the reputation.
- H_{040} : Internationalized faculty and scholars have no effect on the reputation.
- H_{041} : International research activities have no effect on the reputation.
- H_{042} : Internationalized curriculum has no effect on the reputation.
- H_{043} : Organizational support for internationalization has no effect on the reputation.

Due to a number of variables used in this study, I checked the extent of multicollinearity of the independent variables before conducting the regression. Multicollinearity exists when there is a strong correlation between two or more predictors in a regression model (Field, 2000). According to Field (2000), it becomes impossible to obtain unique estimates of the regression coefficients if two of the variables included in the regression model are essentially measuring the same thing. Consequently, high levels of collinearity increase the probability that a good predictor will be found non-significant and rejected from the model (Ibid).

To ensure that redundant variables were not a problem, I assessed the collinearity diagnostics by examining tolerance and the Variance Inflation Factors (VIF) in the SPSS outputs. The literature recommends the acceptable limits of tolerance levels above .2 and VIFs below 5.0 in order to avoid the problems with multicollinearity (Field, 2000; Neter et al, 2004). As shown in Table 5, VIF levels and tolerance levels all fell within acceptable limits. This implies that multicollinearity is of no concern for the regression analysis in this study.

Table 5

Collinearity Statistics

Independent Variables	Tolerance	VIF
International Students	.847	1.181
U.S. Study Abroad	.855	1.170
Internationalized Faculty and Scholars	.616	1.625
International Research Activities	.503	1.989
Internationalized Curriculum	.781	1.280
Organizational Support	.661	1.514

Several statistics were used to test for regression models' "goodness of fit" and significance. The coefficient of determination (R^2) was used to report the proportion of the variance in the dependent variable that is explained by the independent variables in each model. The significance of each model was tested with F statistics. The significance level of the overall F of the model was .05. Therefore, the model was considered good at predicting a set of quality variables if the significance level was .05 or less. The significance of independent variable β coefficients was tested using the t statistic. Significance was reported at the levels of $p = .001$, $p = .01$, and $p = .05$.

According to Tabachnick and Fidell (2001, p. 117), a rule of thumb for the sample size in multiple regression is that there must be at least 20 times as many cases as independent variables. In this study, there are six independent variables, which require at least 120 institutions for the valid results. However, there were only 77 institutions available to use for the current study. As a result, I used *adjusted* R^2 instead

of R^2 because *adjusted* R^2 is required when the number of independent variables is high relative to the number of cases (Howell, 2002).

In addition to explaining the predictive value of the overall model, I used multiple regression analysis to establish the relative predictive power of the independent variables on each dependent variable by comparing β weights. Again, significance level of .05 was used to indicate whether the particular independent variable is a significant predictor of the dependent variable, over and above the other independent variables. After examining the significance of the predictor, I determined the direction of the relationship between the two variables by looking at the signs of β weights associated with each independent variable used in the model. There were no missing data in this study.

Summary

This chapter reviewed the research methods employed in the study. In sum, the current study is a quantitative research using the correlation and multiple regression analysis. The study utilized the publicly available data for 77 research universities in the U.S. With six independent variables and seven dependent variables, the study proposed seven regression models and 43 hypotheses. The process of data analysis and limitations and delimitations were discussed in detail in the current chapter. The next chapter reports the results of the study.

CHAPTER 4. RESULTS

This chapter presents the results from the correlation analysis and the multiple regression analysis to examine the relationship between internationalization and quality of higher education. The chapter consists of four sections. The first section presents the descriptive analysis of the research universities included in the study. The second section presents the results of the correlation analysis. The third section presents the results of the regression analysis for the seven models that examined the relationship between internationalization variables and quality variables. The final section presents the summary of the results.

Descriptive Analysis

This section presents the descriptive analysis of the sample of research universities in the U.S. for the internationalization, quality of higher education, 17 indicators used to measure internationalization, and 10 indicators used to measure quality of higher education. Table 6 shows the descriptive statistics of internationalization and quality index scores. The mean of each variable is zero because this study used the standardized data of the indicators to calculate both index scores. It is notable that the median values for both variables are smaller than zero, which suggests that the distributions are positively skewed. In fact, the positive values of the skewness statistics in Table 6 clearly indicate that the sample data for both internationalization and quality of higher education have positively skewed distributions.

Table 6

Descriptive Statistics of Internationalization and Quality

	N	Minimum	Maximum	Mean	Median	SE	Skewness	Kurtosis		
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	SE	Statistic	SE
Internationalization	77	-14.89	24.19	.0000	-1.1811	7.87629	.828	.274	.647	.541
Quality	77	-9.83	28.71	.0000	-2.7708	7.03079	1.573	.274	3.250	.541

Figure 1. Standardized Distribution of Internationalization Index Scores

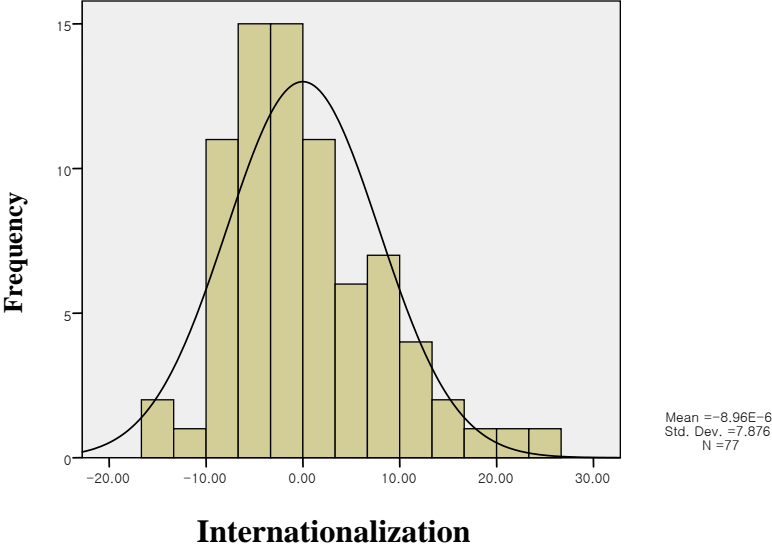


Figure 2. Standardized Distribution of Quality Index Scores

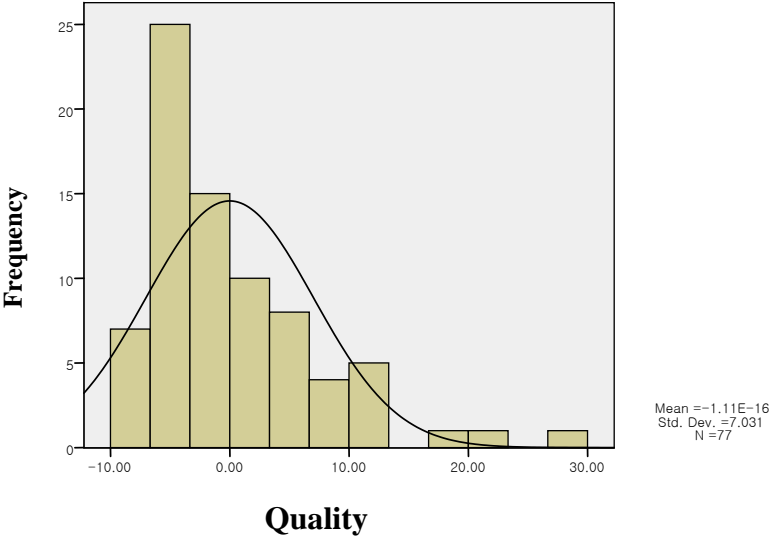


Figure 3. Scatter Plot of Standardized Internationalization Index Scores for Private and Public Universities

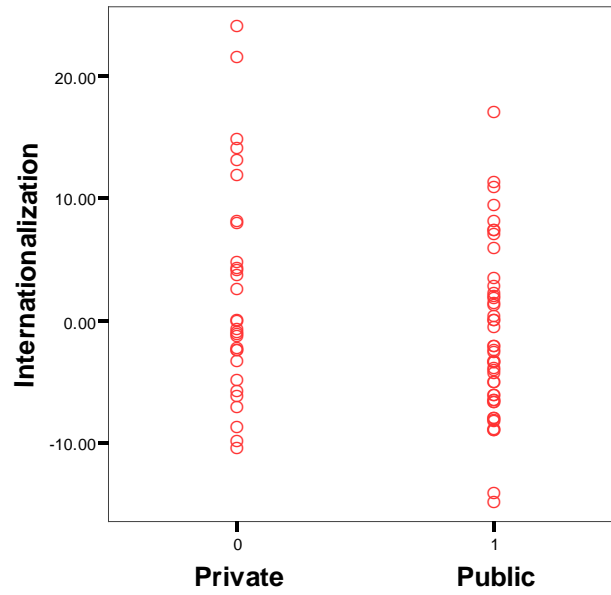


Figure 4. Scatter Plot of Standardized Quality Index Scores for Private and Public Universities

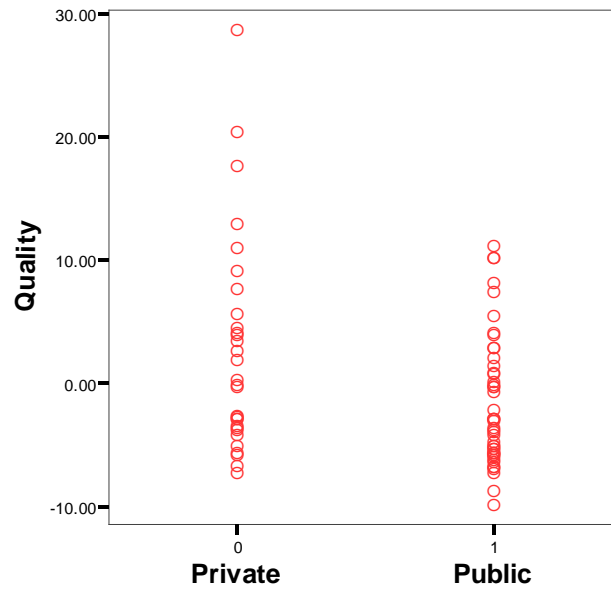


Figure 1 and 2 show that there are more disparities in quality than internationalization among the sample institutions due to the outliers. It is apparent that there are a few top institutions performing extremely well in quality indicators. In addition, Figure 3 and 4 illustrate the different levels of quality and internationalization of private and public institutions. Overall, the private universities seem to outperform the public universities in the both areas of quality of education and internationalization even though the majority of the universities in both groups fall in the same index scores range. For the purpose of the current study, any further analysis in terms of the difference between private and public institutions will not be made.

Table 7 shows the descriptive statistics of the internationalization indicators used to measure the internationalization index scores of the sample research universities. Unlike the statistics in Table 6, I used the raw data for each indicator to describe the real scene of internationalization of the sample research universities in this study. Some important statistics are highlighted as below.

On average, there were 10.23% of international students on campus in the sample universities in 2001. Considering the lower national enrollment rates (4.3%) of international students in the same year (IIE, 2007), it is obvious that the sample research universities hosted more international students than other types of higher education institutions. This phenomenon was simply because the majority of international students were enrolled at the graduate programs at research universities (Hayward, 2000).

In terms of study abroad, 19.38% of the U.S. undergraduate students in the sample research institutions participated in study abroad programs in 2001. This rate of study abroad participants in research universities is remarkably higher than the national

Table 7

Descriptive Statistics of Sample Research Universities on Internationalization Indicators

	N	Minimum	Maximum	Mean	SD	Skewness	Kurtosis		
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	SE	Statistic	SE
International students (%)*	77	1.77	26.51	10.23	5.67	1.03	.274	0.62	.541
Foreign languages graduates (%)	77	.31	7.74	2.04	1.34	1.89	.274	6.15	.541
Marshall and Rhodes scholars (#)**	77	0	5	0.65	1.05	1.88	.274	3.84	.541
Student Fulbright Fellows (#)	77	0	26	6.47	6.36	1.25	.274	0.83	.541
Peace Corps volunteers (#)	77	1	123	34.79	22.80	1.23	.274	2.03	.541
Study abroad participants (%)	77	2.19	58.95	19.38	12.37	1.17	.274	1.03	.541
U.S. Fulbright faculty (#)	77	0	10	2.99	1.98	0.70	.274	0.88	.541
Int'l Fulbright scholars (#)	77	0	36	6.40	7.11	2.76	.274	8.95	.541
Int'l faculty and scholars (%)	77	.00	28.54	7.24	5.19	1.90	.274	5.57	.541
Title VI centers (#)	77	0	8	1.69	2.17	1.13	.274	0.16	.541
Ford Foundation and FIPSE grants (#)	77	0	5	0.79	1.03	1.69	.274	3.51	.541
Int'l campus centers (#)	77	0	32	5.12	4.66	2.95	.274	14.20	.541
Least Commonly Taught Languages (#)	77	0	101	28.99	22.26	1.20	.274	0.90	.541

Table 7 (continued)

	N	Minimum	Maximum	Mean	SD	Skewness	Kurtosis		
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	SE	Statistic	SE
Language requirements for the bachelor's degree (# of credits)	77	0	12	2.01	3.76	1.58	.274	1.01	.541
Int'l perspective requirements for the bachelor's degree (# of credits)	77	0	9	1.17	2.07	1.76	.274	2.50	.541
Presence of a senior administrator (1-4)***	77	1	4	2.62	1.00	-0.07	.274	-1.06	.541
International books (#)	77	46734	2229063	363332.74	337788.75	2.79	.274	11.54	.541

* % denotes the percentage.

** # denotes the number.

*** 1-4 indicates the degree of the presence of senior administrators for internationalization

rate in 1997–98 (3%) (Hayward, 2000). From this comparison, it can be concluded that the study abroad participation has significantly increased from 1997 to 2001. At the same time, it can also be seen that there are more study abroad participants in the sample research universities than other types of higher education institutions.

The average number of the U.S. Fulbright faculty and scholars who have been overseas to either teach or conduct research (2.99) is much less than the Fulbright foreign faculty and scholars on campus (6.4). It is apparent that the number of the faculty exchange between the U.S. and other countries is unbalanced. It is also notable that on average, 7.24% of the faculty and scholars on campus are international.

The average degree of the presence of senior administrators for international activities (2.62) fell between the minimal visibility (i.e., something highlighted that had an international flavor- such as an international conference on campus- but with no indication of its relevance to the institution) and the focused emphasis (i.e., something highlighted that was of particular relevance, such as an option for non-English translations or admission for international students) (Horn et al., 2007, p. 342).

Table 8 shows the descriptive statistics of the quality indicators used to measure the quality index scores of the sample research universities. As in the case of Table 7, I used the raw data to describe the real picture of quality of the sample research universities in the study. Some important statistics are highlighted as follows. The skewness statistics in Table 8 suggest that all the quality indicators, except for the SAT scores, are positively skewed, which means that the majority of the sample research universities were scored lower than the means of the most quality indicators. In particular, endowment and postdoctoral appointees show great disparities between the

Table 8

Descriptive Statistics of Sample Research Universities on Quality Indicators

	N	Minimum	Maximum	Mean	SD	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	SE	Statistic	SE
Total research expenditures (\$)*	77	32158	1244132	323694.31	207582.89	1.56	0.27	4.23	0.54
Federal research expenditures (\$)	77	22907	1106971	206000.40	160483.76	2.67	0.27	12.13	0.54
Endowment assets (\$)	77	57849	22143649	2040131.83	3258619.40	4.02	0.27	20.23	0.54
Annual giving (\$)	77	22586	582584	139158.19	107994.11	1.82	0.27	4.23	0.54
Faculty members in the National Academies (#)**	77	0	267	39.43	54.41	2.86	0.27	8.63	0.54
Faculty awards (#)	77	1	55	19.82	12.89	0.92	0.27	0.16	0.54
Doctoral degrees (#)	77	35	775	337.78	174.44	0.48	0.27	-0.43	0.54
Postdoctoral appointees (#)	77	27	3852	431.08	492.76	4.72	0.27	30.48	0.54
Entering freshmen SAT scores	77	985	1495	1257.55	122.59	0.05	0.27	-0.80	0.54
Reputation (1-5)***	77	2.7	4.9	3.800	0.57	0.33	0.27	-0.75	0.54

* \$ denotes the dollar amounts.

** # denotes the number.

*** 1-5 denotes the level of reputation.

top and the bottom groups of the sample universities. It is also notable that the average reputation scores were 3.8 out of 5. The high reputation scores were due to the fact that the sample research universities used in the study were top research universities in the U.S. identified by Lombardi et al (2003).

Correlations

The Pearson's Product Moment Correlation was computed to assess relationships among the variables in the study. Table 9 presents the correlations among internationalization index scores, quality index scores, six internationalization variables, and seven quality variables. The correlation matrix indicates that a number of correlations were significant at 0.01 and 0.05 levels. In addition, the correlation matrix showed no large values (>0.945) that might suggest corrective action needed to be taken to correct for the effects of identical multicollinearity or the elimination of any variables from further analysis (Hair et al. 1987)⁵.

As shown in Table 9, the degree of internationalization was found to be significantly correlated with that of quality of higher education ($r=.66$). The correlation was significant at the 0.01 level in a two tailed test. Furthermore, *adjusted R²* was .43, which can be translated as 43% of the variance in quality is explained by internationalization. As a result of the significance, the null hypothesis H_{01} that there is no relationship between internationalization and quality of higher education ($r = 0$) was rejected.

The Pearson's correlation matrix also indicates that the institutions with higher degree of internationalization tended to have a greater degree of faculty competitiveness

⁵ Note that the high correlation coefficient (.95**) between faculty competitiveness and quality is because faculty competitiveness is one of the quality indicators. In other word, faculty competitiveness was used to calculate the quality index score.

Table 9

Correlation Coefficients of Internationalization and Quality Variables

	I	Q	IS	SA	IF	IR	IC	OS	RQ	FQ	UQ	AQ	FS	CS	R
Int'lization (I)	1														
Quality (Q)	.66**	1													
Int'l Students (IS)	.41**	.54**	1												
U.S. Study Abroad (SA)	.28*	-.02	.14	1											
Int'lized Faculty (IF)	.63**	.45**	.23*	-.19	1										
Int'l Research (IR)	.83**	.55**	.31**	.14	.53**	1									
Int'lized Curriculum (IC)	.64**	.28*	.20	.12	.32**	.40**	1								
Org. Support (OS)	.68**	.51**	.04	.04	.36**	.53**	.36**	1							
Research Comp. (RQ)	.39**	.76**	.21	-.20	.25*	.43**	.12	.37**	1						
Faculty Comp. (FQ)	.62**	.95**	.50**	-.06	.45**	.50**	.24*	.47**	.66**	1					
Undergraduate Comp. (UQ)	.50**	.61**	.73**	.51**	.14	.34**	.20	.14	.21	.56**	1				
Adv. Training Comp. (AQ)	.62**	.89**	.28*	-.25*	.57**	.54**	.31**	.60**	.70**	.82**	.30**	1			
Financial Stability (FS)	.51**	.72**	.54**	.11	.35**	.28*	.24*	.43**	.18	.68**	.62**	.59**	1		
Constituents' Satisfaction (CS)	.65**	.90**	.54**	.07	.40**	.53**	.34**	.48**	.58**	.81**	.55**	.78**	.70**	1	
Reputation (R)	.70**	.79**	.65**	.32**	.33**	.51**	.29*	.41**	.45**	.78**	.85**	.54**	.65**	.71**	1

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

(.62**), undergraduate competitiveness (.50**), advanced training competitiveness (.62**), financial stability (.51**), constituents' satisfaction (.65**), and institutional reputation (.70**). On the other hand, the institutions with high quality tended to have more international students (.54**), internationalized research activities (.55**), and organizational support for internationalization (.51**).

Based on Table 7, the statically significant correlations among the internationalization and quality variables are highlighted as follows. International students had positive and strong relationship with undergraduate competitiveness (.73**), institutional reputation (.65**), financial stability (.54**), and constituents' satisfaction (.54**). U.S. study abroad had a strong relationship with undergraduate competitiveness (.51**).

Internationalized faculty and Scholars characteristics were strongly related to advanced training competitiveness (.57**) and international research activities (.53**).

Internationalized research characteristics were strongly related to advanced training competitiveness (.54**), organizational support (.53**), faculty competitiveness (.53**), constituents' satisfaction (.53**), reputation (.51**), and faculty competitiveness (.50**). Internationalized curriculum had relatively weak relationship with the other internationalization variables and the quality variables. Organizational support for internationalization was strongly related to advanced training competitiveness (.60**) and internationalized research activities (.53**). The implications of the results are discussed in the next chapter.

Research competitiveness was strongly correlated with advanced training competitiveness (.70**), faculty competitiveness (.66**), and constituents' satisfaction (.58**). Faculty competitiveness was strongly related to international research activities

(.50**) and all the quality variables. Undergraduate competitiveness had a strong relationship with institutional reputation (.85**), international students (.73**), financial stability (.62**), faculty competitiveness (.56**), constituents' satisfaction (.55**), and U.S. study abroad (.51). Advanced training competitiveness was strongly correlated with organizational support (.60**), internationalized faculty and scholars (.57**), internationalized research activities (.54**), and the quality variables except for undergraduate competitiveness. Financial stability was highly correlated with international students (.54**) and all the quality variables except for the research competitiveness. Constituents' satisfaction was highly correlated with international students (.54**), international research activities (.53**), and all the quality variables. Finally, institutional reputation had a strong relationship with international students (.65**), internationalized research activities (.51**), and the quality variables except for research competitiveness.

Regression Results

Multiple regression analyses were conducted to predict the impact of internationalization variables on the quality variables and also to test 42 null hypotheses previously presented in this study. This section addresses the findings of the linear regression analyses of the seven regression models. For each model, I will first report the results of overall model fit and then turn to the details of the individual coefficients.

Table 10

Model One: Regression Analysis for Research Competitiveness

Variables	Unstandardized		Standardized	
	B	Std. Error	β	Sig.
(Constant)	3.85E-016	0.099	0.000	
International Students	0.159	0.108	0.159	
U.S. Study Abroad	-0.296	0.108	-0.296	**
Internationalized Faculty and Scholars	-0.058	0.069	-0.107	
International Research Activities	0.170	0.063	0.381	**
Internationalized Curriculum	-0.042	0.060	-0.079	
Organizational Support	0.162	0.085	0.234	
<i>R</i>	<i>R</i> ²	<i>Adjusted R</i> ²	<i>Sig. F</i>	
0.55	0.30	0.24	***	

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

Model One was created to learn which internationalization variable(s) have a significant effect on the research competitiveness. Model One explained 24% of the variance of the research competitiveness, meaning that 24% of the variability in research competitiveness was accounted for by the internationalization predictors utilized in the model. The F statistic for Model One was significant at the level of $p < .001$.

In Model One: Regression Analysis for Research Competitiveness, two variables were statistically significant, including U.S. Study Abroad ($\beta = -0.296$, $p < .01$) and International Research Activities ($\beta = 0.381$, $p < .01$). The findings indicate that the two variables are significantly predictive of the research competitiveness of research

universities. In particular, U.S. Study Abroad is negatively predictive, whereas International Research Activities are positively predictive.

The finding that international research activities ($\beta=0.381, p<.01$) are positively predictive of research competitiveness is not surprising due to the similar characteristics of the variables and their high correlation coefficient ($r = 0.427, p<.001$). However, it is interesting that the U.S. Study Abroad ($\beta=-0.296, p<.01$) is negatively predictive of the research competitiveness in the model. Possible reasons and implications of these results are further explored in the next chapter.

The null hypotheses H_{02} to H_{07} suggest that internationalization variables have no significant effects on research competitiveness. The results of Model One rejected H_{03} and H_{05} but failed to reject H_{02} , H_{04} , H_{06} , and H_{07} .

H_{02} : International students have no effect on the research competitiveness.

H_{03} : U.S. study abroad has no effect on the research competitiveness.

H_{04} : Internationally experienced faculty and scholars have no effect on the research competitiveness.

H_{05} : International research activities have no effect on the research competitiveness.

H_{06} : Internationalized curriculum has no effect on the research competitiveness.

H_{07} : Organizational support for internationalization has no effect on the research competitiveness.

Table 11

Model Two: Regression Analysis for Faculty Competitiveness

Variables	Unstandardized		Standardized	
	B	Std. Error	β	Sig.
(Constant)	1.07E-015	0.157		
International Students	0.809	0.172	0.429	***
U.S. Study Abroad	-0.233	0.171	-0.124	
Internationalized Faculty and Scholars	0.144	0.109	0.142	
International Research Activities	0.125	0.099	0.149	
Internationalized Curriculum	-0.069	0.095	-0.069	
Organizational Support	0.458	0.134	0.353	**
R	R^2	<i>Adjusted R²</i>	Sig. <i>F</i>	
0.71	0.51	0.47	***	

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

Model Two was formed to see which internationalization variable(s) have a significant effect on the faculty competitiveness. Model Two explained 47% of the variance of the faculty competitiveness, meaning that 47% of the variability in faculty competitiveness was accounted for by the internationalization predictors utilized in the model. The F statistic for Model Two was significant at the level of $p < .001$.

In Model Two: Regression Analysis for Faculty Competitiveness, two variables were statistically significant, including International Students ($\beta = 0.429$, $p < .001$) and Organizational Support for Internationalization ($\beta = 0.353$, $p < .01$). The findings indicate that the two variables are significantly and positively predictive of the faculty competitiveness of research universities. It is surprising that the internationalized

faculty and scholars are found not to be significantly predictive of the faculty competitiveness.

Hypotheses H_{08} to H_{013} indicate that internationalization variables have no effect on faculty competitiveness. The results of Model Two rejected H_{08} and H_{013} , but failed to reject H_{09} , H_{010} , H_{011} , and H_{012} .

H_{08} : International students have no effect on the faculty competitiveness.

H_{09} : U.S. study abroad has no effect on the faculty competitiveness.

H_{010} : Internationalized faculty and scholars have no effect on the faculty competitiveness.

H_{011} : International research activities have no effect on the faculty competitiveness.

H_{012} : Internationalized curriculum has no effect on the faculty competitiveness.

H_{013} : Organizational support for internationalization has no effect on the faculty competitiveness.

Table 12

Model Three: Regression Analysis for Undergraduate Competitiveness

Variables	Unstandardized		Standardized	
	B	Std. Error	β	Sig.
(Constant)	-3.8E-015	0.063		
International Students	0.659	0.069	0.659	***
U.S. Study Abroad	0.420	0.069	0.420	***
Internationalized Faculty and Scholars	0.019	0.044	0.035	
International Research Activities	0.013	0.040	0.029	
Internationalized Curriculum	-0.017	0.038	-0.031	
Organizational Support	0.054	0.054	0.078	
R	R^2	<i>Adjusted R²</i>	Sig. <i>F</i>	
0.85	0.72	0.70	***	

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

Model Three was used to learn which internationalization variable(s) have a significant effect on the undergraduate competitiveness. Model Three explained 70% of the variance of the undergraduate competitiveness, meaning that 70% of the variability in undergraduate competitiveness is accounted for by the internationalization predictors in the model. The F statistic for Model Three was significant at the level of $p < .001$.

In Model Three: Regression Analysis for Undergraduate Competitiveness, two variables were statistically significant, including International Students ($\beta = 0.659$, $p < .001$) and U.S. Study Abroad ($\beta = 0.420$, $p < .001$). Both international students and U.S. study abroad participants have a positive effect on undergraduate student competitiveness. The results show how important student factors of internationalization are in improving the quality of higher education. Surprisingly, internationalized curriculum did not have a significant impact on undergraduate competitiveness. The current issues of internationalized curriculum and its relationship with undergraduate education are discussed in detail in the next chapter.

Hypotheses H_{014} to H_{019} suggest that internationalization variables have no effect on undergraduate competitiveness. The results of Model Three rejected H_{014} and H_{015} , but failed to reject H_{016} , H_{017} , H_{018} , and H_{019} .

H_{014} : International students have no effect on the Undergraduate competitiveness.

H_{015} : U.S. study abroad has no effect on the Undergraduate competitiveness.

H_{016} : Internationalized faculty and scholars have no effect on the Undergraduate competitiveness.

H_{017} : International research activities have no effect on the Undergraduate competitiveness.

H_{018} : Internationalized curriculum has no effect on the Undergraduate competitiveness.

H_{019} : Organizational support for internationalization has no effect on the Undergraduate competitiveness.

Table 13

Model Four: Regression Analysis for Advanced Training Competitiveness

Variables	Unstandardized		Standardized	
	B	Std. Error	β	Sig.
(Constant)	-2.8E-016	0.127		
International Students	0.324	0.138	0.192	*
U.S. Study Abroad	-0.461	0.138	-0.273	**
Internationalized Faculty and Scholars	0.204	0.088	0.224	*
International Research Activities	0.123	0.080	0.163	
Internationalized Curriculum	0.008	0.076	0.009	
Organizational Support	0.507	0.108	0.436	***
R	R^2	<i>Adjusted R²</i>	Sig. F	
0.78	0.60	0.57	***	

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

Model Four was set to learn which internationalization variable(s) have significant effect on the advanced training competitiveness of the research universities. Model Four explained 57% of the variance of the advanced training competitiveness, meaning that 57% of the variability in advanced training competitiveness is accounted for by the internationalization predictors utilized in the model. The F statistic for Model Four was significant at the level of $p < .001$.

In Model Four: Regression Analysis for Advanced Training Competitiveness, four variables were statistically significant. They include International Students ($\beta = 0.192$, $p < .05$), U.S. Study Abroad ($\beta = -0.273$, $p < .01$), Internationalized Faculty

and Scholars ($\beta=0.224, p<.05$), and Organizational Support ($\beta = 0.436, p<.001$). The findings indicate that the three variables are significantly and positively predictive of the advanced training competitiveness of research universities, while one variable is significantly but negatively predictive of the dependent variable. It is understandable to find out that the faculty portion of the internationalization has a positive effect on the Ph.D. and postdoctoral training. However, it was unexpected that study abroad program would have a negative effect on advanced training. These results will be further analyzed in the next chapter.

Hypotheses H_{020} to H_{025} suggest that internationalization variables have no effect on the advanced training competitiveness. The results of Model Four rejected H_{020} , H_{021} , H_{022} , and H_{025} but failed to reject H_{023} and H_{024} .

H_{020} : International students have no effect on the advanced training competitiveness.

H_{021} : U.S. study abroad has no effect on the advanced training competitiveness.

H_{022} : Internationalized faculty and scholars have no effect on the advanced training competitiveness.

H_{023} : International research activities have no effect on the advanced training competitiveness.

H_{024} : Internationalized curriculum has no effect on the advanced training competitiveness.

H_{025} : Organizational support for internationalization has no effect on the advanced training competitiveness.

Table 14

Model Five: Regression Analysis for Financial Stability

Variables	Unstandardized		Standardized	
	B	Std. Error	β	Sig.
(Constant)	-3.2E-016	0.084		
International Students	0.547	0.091	0.547	***
U.S. Study Abroad	0.087	0.091	0.087	
Internationalized Faculty and Scholars	0.118	0.058	0.218	*
International Research Activities	-0.119	0.053	-0.266	*
Internationalized Curriculum	-0.005	0.050	-0.009	
Organizational Support	0.320	0.071	0.465	***
	R	R^2	<i>Adjusted R²</i>	Sig. <i>F</i>
	0.71	0.50	0.46	***

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

Model Five was created to learn which internationalization variable(s) have significant effects on the financial stability. Model Five explained 46% of the variance of the financial stability, meaning that 46% of the variability in financial stability is accounted for by the internationalization predictors utilized in the model. The F statistic for Model Five was significant at the level of $p < .001$.

In Model Five: Regression Analysis for Financial Stability, four variables were statistically significant. They include International Students ($\beta = 0.547$, $p < .001$), Internationalized Faculty and Scholars ($\beta = 0.218$, $p < .05$), International Research Activities ($\beta = -0.266$, $p < .05$), and Organizational Support ($\beta = 0.465$, $p < .001$). The findings indicate that the three variables are significantly and positively predictive of the financial stability of research universities, while one variable is significantly but

negatively predictive of the dependent variable in Model Five. Further analysis of the results is provided in the next chapter.

Hypotheses H_{026} to H_{031} suggest that internationalization variables have no significant effects on financial stability. The results of Model Five rejected H_{026} , H_{028} , H_{029} , and H_{031} but failed to reject H_{027} and H_{030} .

H_{026} : International students have no effect on the financial stability.

H_{027} : U.S. study abroad has no effect on the financial stability.

H_{028} : Internationalized faculty and scholars have no effect on the financial stability.

H_{029} : International research activities have no effect on the financial stability.

H_{030} : Internationalized curriculum has no effect on the financial stability.

H_{031} : Organizational support for internationalization has no effect on the financial stability.

Table 15

Model Six: Regression Analysis for Constituents' Satisfaction

Variables	Unstandardized		Standardized	
	B	Std. Error	β	Sig.
(Constant)	4.60E-016	0.081		
International Students	0.455	0.089	0.455	***
U.S. Study Abroad	-0.023	0.089	-0.023	
Internationalized Faculty and Scholars	0.041	0.056	0.076	
International Research Activities	0.064	0.051	0.143	
Internationalized Curriculum	0.023	0.049	0.043	
Organizational Support	0.239	0.069	0.346	**
R	R^2	<i>Adjusted R²</i>	Sig. F	
0.73	0.53	0.49	***	

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

Model Six was formed to see which internationalization variable(s) have significant effect on the constituents' satisfaction measured by annual giving. Model Six explained 49% of the variance of the constituents' satisfaction, meaning that 49% of the variability in constituents' satisfaction is accounted for by the internationalization predictors utilized in the model. The F statistic for Model Five was significant at the level of $p < .001$.

In Model Six: Regression Analysis for Constituents' Satisfaction, two variables were statistically significant, including International Students ($\beta = 0.455, p < .001$) and Organizational Support ($\beta = 0.346, p < .01$). The findings indicate that the two variables are significantly and positively predictive of the constituents' satisfaction with research universities. It is interesting to learn that the presence of international students and organizational support and leadership for internationalization have a positive effect on the satisfaction level of the constituents at research universities. Hypotheses H_{032} to H_{037} suggest that internationalization variables have no significant effects on constituents' satisfaction. The results of Model Six rejected H_{032} and H_{037} but failed to reject H_{033} , H_{034} , H_{035} , and H_{036} .

H_{032} : International students have no effect on the constituents' satisfaction.

H_{033} : U.S. study abroad has no effect on the constituents' satisfaction.

H_{034} : Internationalized faculty and scholars have no effect on the constituents' satisfaction.

H_{035} : International research activities have no effect on the constituents' satisfaction.

H_{036} : Internationalized curriculum has no effect on the constituents' satisfaction.

H_{037} : Organizational support for internationalization has no effect on the constituents' satisfaction.

Table 16

Model Seven: Regression Analysis for Reputation

Variables	Unstandardized		Standardized	
	B	Std. Error	β	Sig.
(Constant)	-9.5E-016	0.072		
International Students	0.559	0.078	0.559	***
U.S. Study Abroad	0.237	0.078	0.237	**
Internationalized Faculty and Scholars	0.049	0.050	0.090	
International Research Activities	0.047	0.045	0.107	
Internationalized Curriculum	-0.018	0.043	-0.034	
Organizational Support	0.205	0.061	0.297	**
R	R^2	<i>Adjusted R²</i>	Sig. <i>F</i>	
0.80	0.64	0.61	***	

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

Model Seven was set to learn which internationalization variable(s) have a significant effect on the institutional reputation of research universities. Model Seven explained 61% of the variance of the reputation, meaning that 61% of the variability in reputation is accounted for by the internationalization predictors utilized in the model. The F statistic for Model Five was significant at the level of $p < .001$.

In Model Seven: Regression Analysis for Reputation, three variables were statistically significant. They include International Students ($\beta = 0.559$, $p < .001$), U.S. Study Abroad ($\beta = 0.237$, $p < .01$), and Organizational Support ($\beta = 0.297$, $p < .01$). The findings indicate that the three variables are significantly and positively predictive of the reputation of research universities. The results show that the reputation of an

institution is affected by the student factors of and institutional leadership for internationalization.

Hypotheses H_{038} to H_{043} suggest that internationalization variables have no significant effects on reputation. The results of Model Seven rejected H_{038} , H_{039} , and H_{043} , but failed to reject H_{040} , H_{041} , and H_{042} .

H_{038} : International students have no effect on the reputation.

H_{039} : U.S. study abroad has no effect on the reputation.

H_{040} : Internationalized faculty and scholars have no effect on the reputation.

H_{041} : International research activities have no effect on the reputation.

H_{042} : Internationalized curriculum has no effect on the reputation.

H_{043} : Organizational support for internationalization has no effect on the reputation.

Summary

This chapter has reported the results of the statistical analyses employed to answer the research questions: 1) what is the relationship between internationalization and quality of higher education?, and 2) to what extent and in what ways are internationalization variables related to quality variables? The correlation analysis indicated that there was a positive relationship between internationalization and quality of higher education. In other words, the institutions with a higher level of internationalization tend to have a better quality of education.

In terms of the second research question, several of the results were particularly interesting. Among the seven models in the study, Model Two: Regression Analysis for Undergraduate Competitiveness had the highest variance explained (69%) by the six internationalization variables. This finding was mainly due to the significant effects of internationalization's two student variables, international students and U.S. study

abroad participants. Another high variance explained for was found in Model Seven: Regression Analysis for Reputation. In this model, internationalization variables explained 61% of the variability in institutional reputation. This finding was also affected by the two student variables and organizational support.

As noted above, overall, the student variables of internationalization had significant effects on the quality variables. In particular, the presence of international students was found to have statistically significant and positive effects on all the quality variables except for the research competitiveness. However, U.S. study abroad participants showed the contrary results. While they were statistically significant and positive predictors of undergraduate competitiveness and institutional reputation, they had statistically significant but negative effects on research competitiveness and advanced training competitiveness.

Another interesting finding is that the organizational support for internationalization played a significant role in institutional quality enhancement. The regression analyses of the seven models indicated that the organizational support for internationalization was significantly and positively predictive of faculty competitiveness, advanced training competitiveness, financial stability, constituents' satisfaction, and institutional reputation. Lastly, it was surprising that internationalized curriculum was found to have no effect on any quality variables. These results will be further discussed in the following chapter.

CHAPTER 5. DISCUSSION AND CONCLUSIONS

Introduction

This chapter discusses the research findings and presents the conclusions of the study. The chapter consists of six sections. The first section presents a summary of the study. The second section discusses the major findings. The third section presents the implications and suggestions. The fourth section presents the limitations of the study. The fifth section makes recommendations for future research. Finally, the chapter concludes with a discussion of the importance of improving the quality of internationalization and practicing outcome assessments of the internationalization efforts.

Summary of the Study

This study examined the relationship between internationalization and quality of higher education at U.S. research universities with very high research activity. The purpose of the study was to provide clear evidence of whether internationalization enhances the quality of higher education. The findings of the study could guide higher education institutions in developing efficient and effective strategies for improving not only the quality of education but also the quality of internationalization.

The study addressed two research questions: 1) what is the relationship between internationalization and quality of higher education?; and 2) to what extent and in what ways are internationalization variables related to quality variables? The internationalization variables were international students, U.S. study abroad, internationalized faculty and scholars, international research activities, internationalized curriculum, and organizational support. The quality variables were research

competitiveness, faculty competitiveness, undergraduate competitiveness, advanced training competitiveness, financial stability, constituents' satisfaction, and institutional reputation. The primary research methods in this study included the cross-sectional and quantitative analysis using simple correlation and multiple regression analysis. The study used the pre-existing data collected originally by Horn et al (2007), Lombardi et al (2003), and *U.S. News World and Report* (2003).

Major Findings and Discussion

Research Question One

The first research question was “what is the relationship between internationalization and quality of higher education?” As shown in Table 9, there was a statistically significant and positive relationship between internationalization and quality of higher education with a moderately high correlation ($r=.66$, $p<.01$). This finding suggests that the higher education institutions- in this case, the research universities- with a higher level of internationalization tend to have a better quality of education, and vice versa. The results provide a strong and positive ground for international educators supporting the academic rationale for internationalization which assumes that there is value added to the quality of higher education systems when enhancing the international dimension of teaching, research and service (Knight, 1997).

One of the reasons for the positive relationship between internationalization and quality of higher education can be the worldwide globalization phenomenon.

Universities are now global institutions, and globalization has added a new element to national competition and stratification of the universities (Marginson, 2007).

Universities try to achieve high quality education nationally and internationally. From

an institutional perspective, the chief benefit of internationalization is that institutions become better equipped to function in a global society, achieving international standards, and competing successfully with institutions around the world (Knight, 1997).

The positive relationship between internationalization and quality of higher education creates a positive cycle in the dynamics of higher education institutions. A higher national and international profile of internationalized institutions is likely to 1) competitively attract researchers, faculty and students to the institution; 2) bring new opportunities for scholarship and research; 3) support a more diversified population on campus; and 4) provide enhanced job mobility for students (Ellingboe, 1998; Knight, 1999b). These benefits will improve the quality of higher education by fostering international research and publications, developing students' vocational competencies, and making institutions more competitive.

Similarly, the positive circle of the dynamics of higher education institutions can also be explained with their resources and knowledge productivity. According to Cooper (2007), a wealthy university can attract the top academics from all over the world by offering top salaries and top-class facilities. The competitive scholars and the affluent environment will contribute to the increased research activities, which will help institutions gain or maintain a higher level of reputation nationally and internationally. Subsequently, more bright international students will be attracted to these highly ranked research universities and that will help the institutions generate more research productivity with better quality (Marginson, 2007). This will help the institutions be ranked highly again and secure more funding (Cooper, 2007).

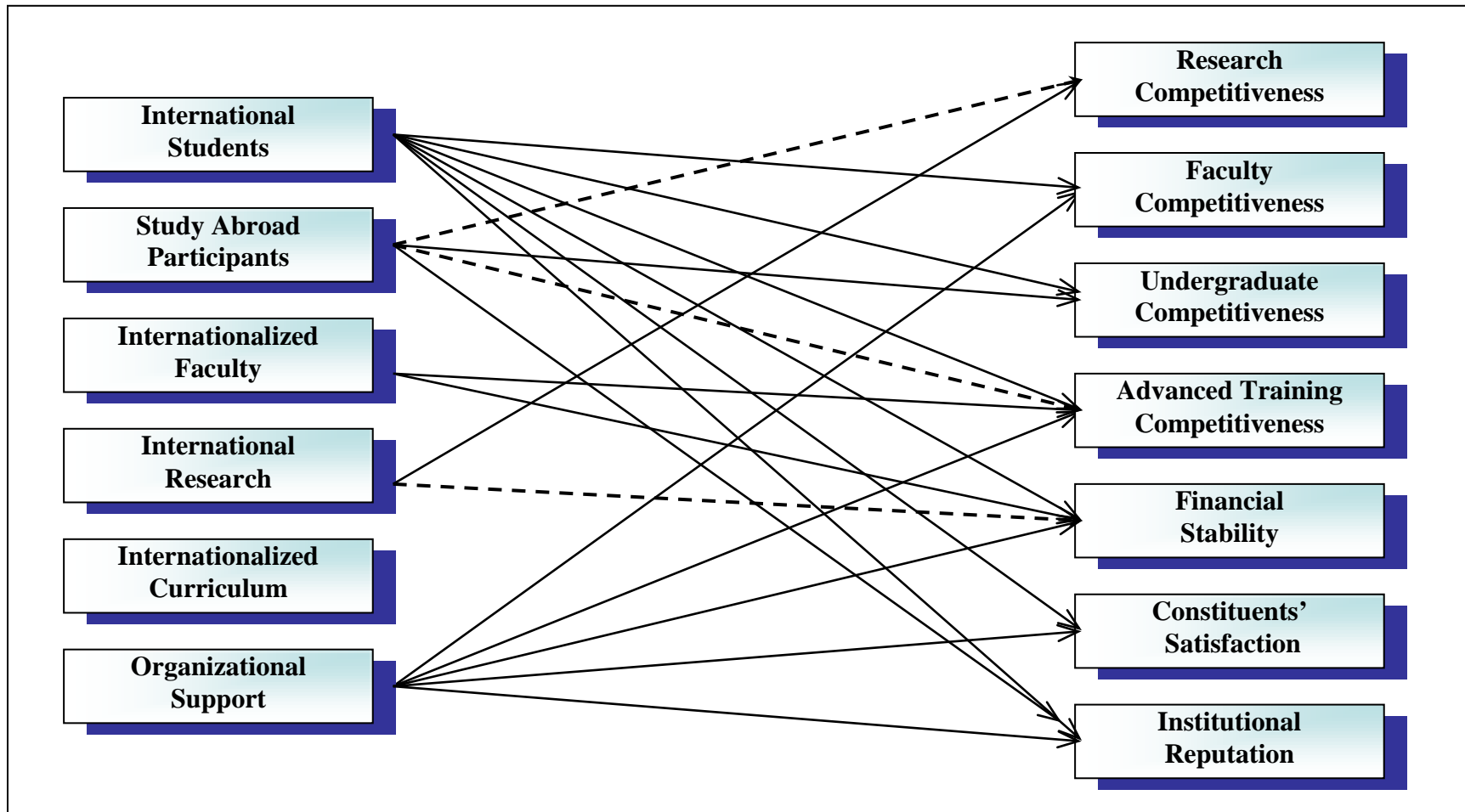
This section discussed the overall positive relationship between internationalization and quality of higher education. The next section will provide more detailed information about their relationship based on the seven models developed in this study.

Research Question Two

The second research question was “to what extent and in what ways are internationalization variables related to quality variables?” Seven models were developed to identify the relationships, if any, between the set of internationalization variables and that of quality variables. In the seven models, internationalization variables including international students, U.S. study abroad, internationalized faculty and scholars, international research activities, internationalized curriculum, and organizational support were independent variables. The dependent variables were, then, the quality variables including research competitiveness, faculty competitiveness, undergraduate competitiveness, advanced training competitiveness, financial stability, constituents’ satisfaction, and institutional reputation. Figure 5 presents the diagram of the results.

Overall, all models were significant in predicting quality variables. Among the seven models in the study, Model Two: Regression Analysis for Undergraduate Competitiveness had the highest variance explained for (69%) by the six internationalization variables. This finding was mainly due to the significant effects of internationalization’s two student variables such as international students and U.S. study abroad participants. Another remarkable variance explained for was found in Model Seven: Regression Analysis for Reputation. In this model, internationalization variables

Figure 5. Diagram of the Relationship between Internationalization variables and Quality variables



* - - - - - indicates a negative relationship.

explained 61% of the variability in institutional reputation. This finding was also affected by the two student variables and organizational support.

International Students

Among the internationalization variables, the student variables of internationalization had significant effects on the quality variables. Particularly, the presence of international students was found to have statistically significant and positive effects on all the quality variables except for the research competitiveness. International students are believed to enrich university campuses and bring a positive educational effect on the domestic students in the host university by enhancing international understanding (Mestenhauser, 1976; Bond and Bowry, 2002; McCollow, 1989). The basis for these claims is that international students bring unique perspectives shaped by different cultures, laws, politics, economics, and natural environments (Mestenhauser, 1976; Bond and Bowry, 2002). Moreover, exposing domestic students to these perspectives and experiences will promote a greater awareness of world affairs, global issues, and greater sensitivity to cultural differences (Bond and Bowry, 2002).

Similarly, the presence of international students brings diversity in classrooms and on campus, which enhances the educational experiences of all students (Umbach and Kuh, 2003). According to Gurin (1999), students with more diversity experiences show greater relative gains in critical and active thinking. Experience with diversity also appears to be positively associated with retention rates and degree aspirations (Chang, 1999), more frequent participation in community service (Bowen and Bok, 1998; Gurin, 1999), and higher levels of civic engagement, cultural awareness, and commitment to improving racial understanding (Milem, 1994).

The international students are expected to have the potential to change both the content and the process of education by bringing an international perspective to classroom discussions and challenging teachers to consider new methods of instruction that are more consistent with their previous learning experiences (Ward, 2001). Also, the international students bring financial gains to the universities by paying the full fee of their academic expenses (Cunningham, 1991). Furthermore, the host country gains increased international exposure and strengthened long-term commercial, trade, and diplomatic linkages with other countries (Prieto, 1995).

In addition, there are strong arguments in the literature that international students play a critical role in developing research endeavors particularly in the science and engineering fields. In the U.S., 44.6% of international students are in the graduate programs, which comprise 13.5% of the total number of graduate students in the U.S. (Institute of International Education, 2001a, 2001b; National Center for Education Statistics, 2001). Also, 32.1% of the international graduate students are in the Science, Technology, Engineering, and Mathematics (STEM) fields. It is argued that U.S. universities, particularly in their science and engineering programs, have grown heavily dependent on attracting the best and brightest from around the world as graduate students, teaching assistants, and post doctoral associates (Hser, 2003; Stohl, 2007). As a result, researchers assert that a serious decline in the numbers or quality of these international students will create tremendous difficulties for the maintenance of excellence in these STEM areas (Stohl, 2007; Sefa Dei, 1993).

Despite the asserted expectations of having international students on campus, some researchers argue that the mere presence of international students is insufficient in

itself to foster intercultural interactions, to develop intercultural friendships, and to result in international understanding (Ward, 2001). The researchers believe that intercultural encounters do not automatically increase the intercultural competence of students (Otten, 2003; Paige, 1993) unless the individuals have a chance to reflect on the intercultural encounters with people from other cultures (Brewer, 1996; Gaertner, Dovidio, and Bachman, 1996). At present, it appears that the attainment of intercultural competence depends upon directed policy development and implementation rather than the mere presence of an international body of students (Bond and Bowry, 2002).

U.S. Study Abroad

While international students had significant and positive effects on most quality variables in the study, U.S. study abroad showed the mixed results. The U.S. study abroad was statistically significant and positive predictors of undergraduate competitiveness and institutional reputation. However, it had statistically significant but negative effects on research competitiveness and advanced training competitiveness. It is unclear why there are unfavorable relationships between study abroad and research activities. One possible explanation is that the characteristics of the two events are completely different among the studied institutions; study abroad is implemented mainly at an undergraduate level while the research activities and advanced research training are conducted at a graduate level. Therefore, the research universities with a high focus on undergraduate education may end of placing less resources on graduate level research projects. However, this is just an assumption that needs more investigation.

There is a large body of literature arguing strongly that international or intercultural experiences abroad have numerous benefits for undergraduate college students, which explain the positive impact of study abroad on undergraduate students' competitiveness. Much of the literature is concerned with outcomes for individual students and alumni, including language acquisition, intercultural and cross cultural competence, personal growth, academic outcomes, and professional development (Opper, Teichler, and Carlson, 1990; Freed, 1995; Shannon, 1995; Wagner and Magistrale, 1995; Whalen, 1996; Jurasak, Lamson, and O'Maley, 1996; Akande and Slawson, 2000; Douglas and Jones-Rikkens, 2001; Cummings, 2001; Bacon, 2002; Allen and Herron, 2003; Davis and Mellow, 2003; Dwyer, 2004; Jenkins and Skelly, 2004; Van Hoof and Verbeeten, 2005).

Studies report that students who participate in study abroad have improved language skills (Opper, Teichler, and Carlson, 1990). A longitudinal study that surveyed 17,000 alumni who participated in study abroad between 1950 and 1999 indicates that participants benefited significantly from the academic, language and intercultural results of an education abroad experience (Dwyer, 2004). According to Teichler and Janson (2007), the temporary study period for European students in another European country undertaken in the framework of ERASMUS is considered to be professionally valuable. For example, the authors argue that former ERASMUS students and other internationally mobile students felt three times stronger in foreign language proficiency than formerly non-mobile students. Moreover, the majority of former ERASMUS students were convinced that temporary study in another country was helpful in getting

to know the culture and society of the host country and in understanding other cultures and getting along with persons from different cultural backgrounds (Ibid).

Some researchers claim that study abroad experiences enhance the participants' academic ability. One survey conducted in the mid 1980s found that students who participated in study abroad programs exhibited higher knowledge levels (Barrows, 1981). Similarly, a study conducted by the Institute for the International Education of Students (IIES) in 2002 revealed that more than 80% of the participants said that the study abroad experience enhanced their interest in academic study and influenced their subsequent educational experiences.

It is argued that Study abroad experiences contribute to students' intellectual and personal development (Cummings, 2001, Dwyer, 2004; Davis and Mellow, 2003). The survey results from a study by IIES (2002) revealed that more than 90% of the participants indicated that studying abroad influenced their intercultural competencies as well as personal and social growth to a significant degree. According to Davis and Mellow (2003), students returning from overseas develop a greater self-awareness, which is a critical element of an institution's mission to help students develop to their full potential.

Study abroad experiences are believed to have an impact on students' professional development. According to IIES (2002), about 60% of the participants reported that studying abroad allowed them to acquire skills sets that influenced their career path. More recent study regarding the professional value of the ERASMUS program in Europe indicates that the majority of former ERASMUS students are convinced that the ERASMUS experience was helpful for them to obtain their first job

(Teichler & Janson, 2007). According to Teichler and Janson (2007), foreign language proficiency and international experience turn out to be important assets for many former ERASMUS students in their job search, even though the academic knowledge and the personality play more important roles in the employer's recruitment decision.

The literature reviewed above on the impact of study abroad successfully explain the positive impact of study abroad on undergraduate students' competitiveness because much of the literature is concerned with language acquisition, intercultural and cross cultural competence, personal growth, academic outcomes, and professional development of the college students and alumni. However, the current literature fails to explain the relationship between the study abroad and the institutional and research aspects of higher education such as institutional reputation, research competitiveness, and advanced training competitiveness. These unexplained areas need more investigation. As Vincenti (2001) points out, research on study-abroad policy, programs, and student participants is relatively limited in comparison to other areas of higher education. It is imperative to expand the scope of the research on study abroad to include all the units of analysis including departments, institutions, and nations.

Internationalized Faculty and Scholars

In the current study, internationalized faculty and scholars had statistically significant effects on advanced training competitiveness and financial stability among seven quality variables. It is understandable that the faculty and scholars predicted the advanced training competitiveness measured by the number of doctoral and postdoctoral students because the work of faculty and scholars in the research universities are directly related to the work of doctoral and postdoctoral students. Also,

it is interesting that internationalized faculty and scholars predicted the financial stability of the institutions in this study. One possible explanation is that international characteristics of faculty and scholars tend to bring more opportunities in research collaboration as well as external funding sources. This is partly because the scarce sources and funding at higher education institutions force the faculty and scholars to pursue external resources to support their research (Taylor, 2004). This might have impacted the positive relationship between the internationalized faculty and the financial stability. However, this needs more investigation.

The literature fully supports that internationally experienced faculty on campus such as Fulbright scholars are significant assets for both internationalization and quality of education because they are believed to bring rich learning materials into class as well as internationally focused research projects. University and college administrators who have placed internationalization in their mission statements believe international scholars represent educational and cultural resources which increase the level of internationalization (Kuhlman, 1992). Evans (1995) argues that the internationalized body of faculty and scholars play a significant role in enriching students' learning experiences by improving the pedagogy in classroom activities with their international experience. The presence of international scholars on campus is believed to be an important component for promoting understanding of other cultures (Robinson and Colenso-Semple, 1999). Paige (2003) asserts that internationally competent faculty can model the international mindset; include international students as learning resources in their courses; use international examples, readings, and resource persons in their classes; encourage students to do international research and to study abroad; and model

alternative behaviors such as intellectual parochialism, ethnocentrism, and disinterest in international learning (p. 58).

Internationalized characteristics of faculty and scholars improve the faculty competitiveness and foster international research and scholarly publications. According to Evans (1995), American Fulbright Visiting Scholars made a positive impact on internationalizing their institutions with regard to scholarly, personal, pedagogical, political, and international activities. The majority of respondents (91%) of the nationwide survey reported that the Fulbright Program enhanced their professional and scholarly activities. More than 70% increased their publications and found new professional opportunities due to the Fulbright experience. About 50% of the respondents felt that the Fulbright experience influenced pedagogical changes with regard to incorporating international elements to curriculum.

International Research Activities

International research activities were found to have positive effects on research competitiveness but negative on financial stability. It is naturally understood that international research activities will have positive effects on research competitiveness. Researchers argue that internationalization encourages researchers to pursue their research in the international area which makes their work internationally competent (Taylor, 2004). Internationalization also helps researchers as well as students expand their perspectives internationally which results in more research products. Some possible research activities with an internationalization focus include joint research projects, international conferences and seminars, international publications of articles and papers, international research partners in academic and other sectors, and research

conducted abroad (Knight, 1999). These activities help the universities to fulfill their intrinsic mission: conducting research and creating knowledge. As reiterated throughout the paper, international research and publications certainly help higher education institutions develop their quality of education.

It is unclear why international research activities had a negative impact on financial stability. One possibility is a measurement issue. In this study, international research activities were measured using the number of Title VI centers, the number of Ford Foundation grants for international research, the number of FIPSE international education grants, and the number of campus centers focusing on international research, as originally used by Horn, Hendel, and Fry (2007). The measurement issue is an ongoing dilemma not only in this study but also in the field of internationalization and quality of higher education. The indicators used in this study provide only a segment of the research activities as a whole. Therefore, it is possible that international research activities predicted financial stability incorrectly. Consequently, the relationship between international research activities and financial stability needs further investigation.

Even though the international research activities failed to predict the other quality variables such as faculty competitiveness and reputation, the literature provides theoretical framework to make connections between internationalized faculty and quality variables. International collaboration has always been a feature of research activity in leading universities throughout the world (Taylor, 2004). According to Taylor (2004), institutions encourage the international funding and research collaborations. The research collaborations among scholars across the countries help

institutions to develop more advanced international cooperation focusing on sustainable partnerships, which will improve the visibility and reputation of the institutions. From this perspective, it is possible to assert that international research activities have a positive impact on institutional reputation, even though the relationship was not discovered in this study.

Furthermore, the international research activities will expand opportunities for graduate students, both international and domestic, to participate in research activities as research assistance and to pursue their career as researchers. Therefore, the development of the international research activities will foster the development of graduate and postgraduate research programs and eventually will have a strong and positive impact on the advanced training competitiveness of research universities.

Internationalized curriculum

Surprisingly, internationalized curriculum was found to have no effect on any quality variables. Again, this finding may have resulted from the measurement issue. The internationalized curriculum was measured through the number of Less Commonly Taught Languages (LCTL) offered on campus, non-English language credit requirements for the bachelor's degree, and international perspective credit requirements for the bachelor's degree. These indicators are too limited to provide the holistic aspects of the internationalized curriculum.

Another problem associated with the internationalized curriculum is that the current institutional efforts to internationalize their curriculum are fragmented and shallow. Brustein (2007) clearly states that most of the institutions address the need for global competence by adding a diversity or international course(s) requirement or by

offering degree, minor, or certificates in area or international studies. The author laments that students too often complete these programs without any competency in a foreign language or any knowledge of or any specific grounding in the culture of a society outside of the United States.

Many leading scholars believe that internationalizing the curriculum improves, enhances, and benefits higher education (Knight, 1994). One of the earliest definitions of internationalized curriculum is “Curricula with an international orientation in content, aimed at preparing students for performing (professionally and socially) in an international and multi-cultural context, and designed for domestic students as well as foreign students” (OECD, 1995). Current literature emphasizes that internationalizing curriculum is not simply an adjustment, but rather a transformation of the curriculum to provide a unique world perspective that affects students’ view of their field of study and the world itself (Green and Olson, 2003). Moreover, an internationalized curriculum attempts to avoid parochialism and academic ethnocentrism in scholarship and research, and to stimulate critical thinking and inquiry about the complexity of issues and interests that bear on the relations among nations, regions and interest groups (Knight and de Wit, 1995; Picht, 1996; Spizzica’s, 1997).

Even though the internationalized curriculum failed to predict quality variables in this study, the literature maintain that internationalized curriculum develops college students’ intercultural competencies and learning process as well as faculty members’ teaching strategies. One of the primary benefits of internationalized curriculum is that the college or university will make graduates more competitive in the global community, capable of meeting world standards, able to work in cross cultural contexts,

and sensitive to the needs of international customers and partners (Ellingboe, 1998; Knight, 1994). In addition, the quality of teaching is expected to be enhanced as studies of cross-cultural comparisons and international dimensions are included in the curriculum (Ellingboe, 1998). Furthermore, internationalized curriculum could promote students' self-development in a changing world by enhancing mutual understanding and cooperation as a basis for the solution of global problems (Knight, 1994).

Foreign language proficiency of students, a possible outcome of internationalized curriculum, helps higher education institutions enhance the level of internationalization as well as quality of education. According to Ashwill (2001), multicultural sensitivity cannot readily be gained through academic instruction alone. Efforts to learn a second or third language provide evidence of interest in other cultures and form a basis for understanding them (Ashwill, 2001). Knowing other languages also brings opportunities such as a job advantage and providing a competitive edge in the globalized society (Ibid). Some other values of studying another language offered by Frantz (1996) include 1) liberalizing one's experience by helping expand one's view of the world; 2) exposing the learner to modes of thought outside the native language; 3) building practical skills; and 4) teaching and encouraging respect for other peoples in different cultures.

Organizational support

The organizational support for internationalization played a significant role in institutional quality enhancement. The regression analyses of the seven models indicated that the organizational support for internationalization was significantly and

positively predictive of faculty competitiveness, advanced training competitiveness, financial stability, constituents' satisfaction, and institutional reputation.

According to Ellingboe (1998), internationalization of higher education needs strong visionary leadership at different levels in the academy. Universities are complex organizations whose aims are often unclear and stakeholders are varied and numerous (Taylor, 2004). Moreover, universities face a rapidly changing external operating environment with many conflicting pressures and no clearly agreed-upon priorities (Ibid). This environment places a particular emphasis on leadership in the development of internationalization strategies. According to Bartell (2003), the leadership's role is to foster and link a culture congruent with the internationalization objectives and the management of the universities, including resource allocation and control techniques. Therefore, effective leadership is crucial in the development of a strategy for internationalization (Taylor, 2004).

The organizational support for internationalization was measured through the presence of a senior administrator for international activities and the number of books in the university library's international collection. The first indicator measured the level of leadership and the second, the resources for internationalization. According to Taylor (2004), many universities increasingly shift institutional management to higher level positions such as associate provost or assistant vice president for international affairs because internationalization poses a new challenge to university management, requiring additional cost, long-term investments of its resources, and thus central direction. According to Taylor (2004), a key driver toward centralized leadership on international activities is the need for fund-raising, both short-term and long-term. In this case,

international alumni are commonly identified as generous long-term benefactors for their alma mater (Taylor, 2004). This highlights an important role of recruiting international students and satisfying constituents of the university with increased quality of education and services. This will then increase the amount of annual giving, which will eventually enhance the quality of education.

Implications and Suggestions

In this study, I defined the quality of higher education as the extent to which the educational experience at a particular college or university program enhances the knowledge, abilities and skills of students (Harvey and Green, 1993; Astin, 1985) or the differences that the higher education institution has made in the growth of all members of the institution, including intellectual, moral, social, vocational, physical, and spiritual development (Bergquist, 1995). Unfortunately, the measurement indicators for the quality in the study were closer to the resources and the input elements rather than students' learning experiences because of the difficulty in measuring the value-added of the educational experiences. Ironically, the benefits of internationalization are more closely related to the value-added of students' learning experiences. Thus, it seems relevant to engage internationalization in the discussion of quality improvement of students' learning experiences.

This study argues that the presence of international students on campus can have strategic importance in motivating and contributing to student learning and in shaping college or university's academic and community environment (Burn, 2002). However, despite the positive impact the international students bring to classrooms and on campus, their potential as learning resources is underutilized. Also, enrolling

international students would not necessarily result in their interaction with domestic students. The higher education institutions should fully integrate international students into campus life and encourage them to share their perspectives and cultural expertise in their departments and programs. In addition, the universities should provide global and cross-cultural training for both domestic and international students so that they are aware of the intercultural issues and effectively benefit from each other.

This study also maintains that study abroad is a powerful tool to improve the undergraduate education. Some of the most benefits of study abroad include the enhancement of language acquisition, the development of cross-cultural skills, and the accumulation of knowledge of the host culture (Dwyer and Peters, 2004; Gorka and Niesenbaum, 2001; NAFSA, 2003a). Nevertheless, the number of the study abroad participants is extremely small. NAFSA (2003a) reports that less than 1% of American students are studying abroad each year. There are a variety of reasons why students do not study abroad (NAFSA, 2003b). These include financial constraints, especially concerns about the transfer of financial aid (Curry, 1999). Also, fears about threat of violence against North Americans abroad, particularly in a post-9/11 environment, may inhibit students from going abroad (Institute of International Education, 2000). Another reason students do not study abroad is a perceived or real lack of fit with the academic program or major (NAFSA, 2003a). The University should help the students to overcome these fears through providing incentives such as scholarships and also workshops and trainings such as pre and post departure orientations. In addition, the university faculties and staff should be internationally competent and open minded so that they can provide proper advising to the students with questions.

In the current study, University faculty plays a significant role in enhancing internationalization on campus by developing internationalized curriculum and encouraging students to pursue international experiences. Thus, the universities should hire globally and interculturally competent faculty and/or to provide ongoing global training opportunities for faculty to meet the different needs of a culturally diverse class (Otten, 2003; Olson & Kroeger, 2001). The global training might include globally oriented theme seminars, intensive language summer sessions, a language-across-the-curriculum program, and cross-discipline team teaching (lee Olson & Kroeger, 2001). Semester- or year-long global exchange and fellowships (such as Fulbrights) in other-than-English-speaking countries would provide faculty and staff with the most transformative linguistic and cultural experiences (Ibid).

Faculty can also participate in international education by attending international conferences, teaching and conducting research abroad, working on research and writing projects with international colleagues, and consulting on international projects (Paige, 2003). Also, in a ideal situation, faculty can introduce culturally sensitive teaching methods and integration of different types of course assignments that allow students to apply different skills of knowledge to problem-solving (Otten, 2003).

Despite the benefits of having interculturally competent faculty, it is difficult to entice faculty to become engaged in the efforts to internationalize campus. Brustein (2007) asserts that institutions should create incentives to encourage faculty to become active participants in the efforts to produce globally competent graduates. There are very few universities that explicitly recognize the faculty internationalization contributions as one of the primary measures of research, teaching and service for

promotion, tenure, and merit salary reviews (Stohl, 2007; Brustein, 2007). Thus, it is not surprising that relatively few faculty members participate in international education activities beyond attending international conferences (Brustein, 2007).

Related to the role of faculty in internationalization, internationalized curriculum is considered a top priority in many academic disciplines (Wessel, 2007). Curriculum internationalization is currently done simply by adding international courses or area studies. However, these added classes may or may not increase students' intercultural competences. Thus, several researchers suggest that classes be designed around international topics, international topics and examples be included throughout course materials, and international experience be incorporated in the curriculum (Boyle, Nackerud, and Kilpatrick, 1999; Cushner and Mahon, 2002; A. Roberts, 2003; Lucas, 2003; Dyjack, Anderson, and Madrid, 2001; Foster and Prinz, 1988; Halsey, 1990; Kain and D'Andrea, 1992; Wagenaar and Subedi, 1996). By doing so, students can take the regular classes which are truly transformed to provide unique world perspectives in their own discipline.

Organizational support by highly recognized university leadership can contribute to the process of internationalization through the provision of resources and assistance (Taylor, 2004). According to Taylor (2004), good management should be able to monitor the quality of its strategies for internationalization for future planning. Similarly, Knight (2001) emphasizes the importance of monitoring the process and quality of the internationalization efforts so that the process of internationalization is being evaluated on a regular and consistent basis and that improvements are being made

to ensure that the international dimension of teaching/learning, research, and service is contributing to the relevance and quality of higher education.

Limitations of the Study

Einstein is reported to have said, “Not everything that can be counted counts, and not everything that counts can be counted.” (Cited in McCormick and Zhao, 2005). This statement points to the most serious limitations of the current study: The data used in the study are limited to currently available data and are short of an investment in new data collection. As seen in the literature review chapter, the quality of education is not measurable due to a lack of proper measurement tools. This means that some quality attributes such as student outcomes and output, learning experiences, and value added are difficult to measure. In this study, therefore, the indicators used to identify the top American research universities by Lombardi et al (2005) are used only as proxy measures of quality.

It should also be noted that critical indicators of internationalization such as college students’ international awareness and other attributes are not included in the Horn, Hendel, and Fry’s (2007) study. Due to the current state of possible measurement capability, only measurable indicators were addressed and analyzed in the study. As a result, the internationalization indicators used in my study are limited as proxy measures.

I did not differentiate between public and private institutions in the analysis even though the differences in missions and funding structures between the two entities clearly exist (Lombardi et al, 2003). This is because that the goal of the current study is to understand the overall picture of the research universities. Moreover, this study treats

the undergraduate and graduate programs as the same unit of analysis because both areas are essential to measure internationalization and quality of education even though the degree of internationalization and quality in both areas may be different. These limitations lead to the needs for future studies to investigate the differences in internationalization and quality of education among institutions with different types.

Recommendations for Future Research

This study provided a big picture of the relationship between internationalization and quality of higher education using a number of indicators and variables. Because of the broad scope of the study and also the lack of proper measurements, there were several areas that needed further investigations. For the future research, it would be important to examine the relationships more closely between each internationalization variable and quality variable. The findings of the suggested study will be valid only if the collected data encompass the complex nature of internationalization and quality of higher education. In order to collect the meaningful data, it is significant to develop the measurement indicators that capture the value added of students' learning experiences and their personal growth.

Related to the measurement issue, it is also imperative that higher education institutions pay more attention to the outcome assessment of their internationalization efforts. We, as researchers, need to ask practical questions such as whether we are doing an adequate job of demonstrating to others that internationalization is adding value to higher education and whether the interest and investment in internationalization are making a difference to students, teachers, and services of higher education (Deardorff, 2006). In order to answer these questions, I would suggest that we conduct evaluation

studies and develop measures for outcome assessment. Also, it would be interesting to conduct comparative studies between the institutions in the U.S. and similar ones abroad. This will help us redefine the meaning of internationalization and quality of higher education from international and global perspectives.

Conclusions

Internationalization is one of the major accomplishments in the history of higher education (Groennings, 1987; Knight, 2001). The growing interest in higher education has created the active development of policies, programs, and infrastructure at institutional governmental levels. The key question to ask ourselves is whether the development of internationalization has influenced the quality of higher education, and if so, what the outcomes are. The current study attempted to answer these questions and it seems there are positive outcomes. Although the expansion and investment in internationalization are increasing, we need to direct more efforts toward monitoring and evaluating the progress, quality, results, and impact of the internationalization efforts (Knight, 2001). As Knight (2001) emphasizes, we must ensure that we are doing the right things in the right way (p. 228).

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APPENDIX: List of 77 Institutions Used in the Study

Arizona State University-Main Campus
Boston College
Boston University
Brandeis University
Brown University
Carnegie Mellon University
Case Western Reserve University
Columbia University in the City of New York
Cornell University-Endowed and State Colleges
Dartmouth College
Duke University
Emory University
Georgetown University
Harvard University
Indiana University-Bloomington
Indiana University-Purdue University-Indianapolis
Iowa State University
Johns Hopkins University
Massachusetts Institute of Technology
Michigan State University
New York University
North Carolina State University at Raleigh
Northwestern University
Ohio State University-Main Campus
Pennsylvania State University-Main Campus
Princeton University
Purdue University-Main Campus
Rice University
Rutgers University-New Brunswick
Stanford University
SUNNY at Buffalo
SUNNY at Stony Brook
Texas A and M University
Tufts University
University of Alabama at Birmingham
University of Arizona
University of California-Berkeley
University of California-Davis
University of California-Irvine
University of California-Los Angeles
University of California-San Diego
University of California-Santa Barbara
University of Chicago

University of Cincinnati-Main Campus
University of Colorado at Boulder
University of Delaware
University of Florida
University of Georgia
University of Illinois at Chicago
University of Illinois at Urbana-Champaign
University of Iowa
University of Kansas Main Campus
University of Kentucky
University of Maryland-College Park
University of Massachusetts-Amherst
University of Miami
University of Michigan-Ann Arbor
University of Minnesota-Twin Cities
University of Mississippi Main Campus
University of Missouri-Columbia
University of North Carolina at Chapel Hill
University of Notre Dame
University of Pennsylvania
University of Pittsburgh-Main Campus
University of Rochester
University of South Carolina at Columbia
University of Southern California
University of Tennessee
University of Texas - Austin
University of Utah
University of Virginia-Main Campus
University of Washington-Seattle Campus
University of Wisconsin-Madison
Vanderbilt University
Virginia Polytechnic Institute and State University
Washington University in St Louis
Yale University