Global Engagement of United States Research Universities in the 21st Century

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Dedication

To my grandfathers who inspired me
not to fear challenges and to live to serve others.
&
To my parents for their great sacrifices and unconditional love.

Abstract

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The global dimensions of knowledge production have shaped internationalization which has greatly impacted U.S higher education. The transformation of higher education heavily influenced by neoliberal globalization, massification, and marketization have diminished the core tripartite mission of the university in teaching, research, and service to the community. In particular, the service component has been often undervalued.

This dissertation research has selected 110 U.S research universities that are classified as Carnegie Classification for Community Engagement to see their engagement beyond their regional boundaries. The main purpose of this study is first, to identify which institutional and human resources characteristics are associate with universities' global engagement. Second, to develop a multidimensional index to operationalize the measurement of global engagement and examine which universities are considering global engagement as part of their civic engagement agenda. The instrument was tested using Exploratory Factor Analysis (EFA) and reliabilities analysis. The final model included eighteen items with six factors that have been confirmed through this study. Third, multiple regression was conducted to see what factors influence US research universities' global engagement. This research provides insights for higher education leaders to view their global agenda

holistically and comprehensively that embraces their commitment toward serving for the global community.

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CHAPTER 1

INTRODUCTION

The world is more interconnected than ever before, and many of the challenges we confront are transnational. In his book *The World is Flat,* Friedman (2005) insists that there are no geographic borders in the process of production and distribution. Globalization is an ongoing process that disrupts the borders of nations. This process integrates the world economy, politics, and cultures through new information communications technology and the international knowledge network (Gibson-Graham, 1996; Rumbley & Altbach, 2016).

However, globalization has two sides. The first side of globalization is that it opens new opportunities across the borders, providing easier access to information technology. On the other side, it also creates inequality and tensions between the local and global and the core and the periphery. This is the same for knowledge as well. knowledge information flows across borders becoming the international weaving of national, regional, local, and institutional levels of economies and cultures into a complex global fabric.

The convergence of globalization and the emergence of a knowledge society (Altbach 2007; Stromquist, 2002) has directly influenced higher education. This has created new priorities and practices for educational institutions. In the competitive globalized era, higher education institutions lean forward in response to the demands of a corporate market, producing selective outcomes for higher recognition in the global ranking. These outcomes include establishing campuses overseas and developing strategic plans to recruit more international students and faculty.

In the creation of cross-cultural knowledge through the international exchange at universities, the university becomes a global community. Thus, development-focused institutions, such as the World Bank and USAID also acknowledge the critical role of higher education in the production of knowledge to solve the global issue. As such, this study will argue that universities have a social responsibility to be globally engaged in producing and disseminating knowledge and for the public good and educate students to be globally competent in the knowledge economy era.

The university's adaptation to the demand of globalization has greatly impacted its ability to accomplish its tripartite mission: to teach, to research, and to serve or engage with the community. Some criticize that the demands of globalization have caused universities to de-emphasize the third mission.

After the completion of the Millennium Development Goals in 2015, the United Nations and multilateral agencies, including the World Bank, announced the UN Sustainable Development Goals (SDGs). The SDGs aim to establish "a common global vision of progress toward a safe, just and sustainable space for all human beings to thrive on the planet" (Osborn et al., 2015, p.2). There are 17 goals that indicate the role of the developed countries to steer "their *own* societies and economies in a more sustainable direction, as well as contributing strongly to the global effort to speed the achievement of sustainable development in developing countries" (Osborn et al., 2015).

In the response to globalization and the global common goals of the SDGs, and with a goal of educating students for global citizenship, research universities have become more actively engaged in leading the world's technological innovation and improving the well-being of the entire nation and also the global community

(American Academy of Arts & Sciences, 2016). Therefore, it is critical for higher education institutions to reflect their purported mission and core activities to support global common goals for the global public good. As Osborn (2015) suggests, they are the key entity to provide knowledge in the era of the knowledge economy.

Purpose of the Study

The U.S institutional strategies for higher education have been transformed by globalization and the global dimensions of knowledge creations have shaped internationalization (Knight 1999; 2004). However, higher education institutions, being the most vital actor in terms of producing knowledge, have been heavily influenced by neoliberal globalization, massification, and marketization. This, in turn, has diminished the fundamental role in teaching, research, and service to the community (Bender and Schorske 1998; Dill, 1997). Now, many universities are struggling to fulfill multiple duties at once. For example, a land-grant university is now juggling to be the world's best research university so that they can expand their international footprint and reputation, while at the same time respond to the needs and fulfil their commitment to serve the local community.

Also, the current university ranking systems have revealed an imbalance in criteria where they heavily emphasized research but valued less on teaching and service.

Efforts have been found in US universities to show commitment toward their community. Such effort can be found from applying for the Carnegie classification on Community Engagement. Classified universities are nationally recognized to be institutions that are committed to serving a regional, national, and global community. Often the scope of community engagement has been limited only to serve vicinity

region, neglecting the importance to serve the greater community. The world is more interconnected than ever before, and higher education institutions must put a collective effort to serve the global society to solve the world's wicked problems.

Therefore, this research aims to examine first, the factors that influence institutions' global engagement agenda. Specifically, it examines external and internal factors that affect institutions' global engagement and how to give more weight to institutions' social impact and service to the greater good beyond their regional boundaries. Secondly, this study is to develop an index for global engagement that can measure universities from a different angle than the existing ranking system by highlighting factors reflecting their global engagement.

Research Questions

This study addresses the following research questions:

1) Which institutional and human resources characteristics reflect and define U.S. research universities' global engagement?
2) What are the factors that influence U.S. research universities' global engagement?

Significance of the Study

This dissertation research is significant in several ways and seeks to make contributions in the field of community engagement and international education. This study attempts to engage scholars in re-thinking the fundamental purpose and mission of the university as they pertain to develop strategies around internationalization, global engagement, and public engagement.

This research examines the trends of higher education and the distortion and ongoing transformation of the purported central mission of higher education: teaching, research, and in particular, engagement through service. Also, this investigation examines the universities' global engagement in ways that further and facilitate the global public good. Since universities, especially research universities, are engines for research and evidence-based problem solving, they must take up research power to support the global public good which in the study will be interpreted as knowledge production.

In sum, this study places a new lens on measuring the influential factors that impact a university's global engagement by creating an index designed to measure the current ranking systems differently. This new index will incorporate the external and internal factors that matter for universities to commit to their global engagement agenda. It can be used as a diagnostic that provides information on how universities conceptualize and implement internationalization strategies and a global agenda through public and community engagement practices. This information can be useful to institutional leaders and educational researchers to better understand how to change or re-direct internationalization policies and public/community engagement strategies so that global engagement can be embedded across all parts of their mission.

CHAPTER 2

LITERATURE REVIEW

This chapter focuses on a review of important literature on key theoretical and empirical studies to understand global engagement. Four areas will comprise the literature review: 1) the rise of globalization, and internationalization of US higher education 2) the trends of US public engagement and global engagement; 3) the positive and negative impacts on the global engagement of higher education, and 4) the role of dependency theory. This chapter serves as an overview that informed the entire study and it defines some of the important concepts on which the study is designed.

Globalization and Internationalization in U.S Higher Education

The first section will examine to understand the comprehensive meaning of global engagement. To begin with, it is important to understand globalization and how higher education interacts with internationalization.

Often, the terms globalization and internationalization are incorrectly or used interchangeably, and in fact, they are hard to distinguish. Therefore, distinguishing both terms and understand why 'global engagement' is more appropriate to use than 'internationalization, or international engagement is import for this study.

Many scholars have interpreted globalization in many ways. As such, globalization is a complex phenomenon that goes beyond traversing national borders and conducting international work (Daun, 2015). Robinson & Harris (2000) described globalization as "the transition from the capitalism of national-state to a

new transnational phase, creating “a period of fundamental change in the social order” (p. 16). Held (1991) explained globalization as “the intensification of worldwide social relations which connects distant localities in a way that phenomena in the local area can be shaped by incidents in the remote place and vice versa” (p.141). Similarly, Albrow (1993) defined globalization as “the movement where the population of the world is becoming bonded into a single society” (p, 151). Stiglitz (2002) indicated globalization has brought opportunities for trade, great accessibility to markets, and technology and advanced health systems and the promotion of democracy and greater social justice.

There are multiple sides to globalization. Thacker (2001) pointed out that the process of globalization is not always fair or equal. In line with Thacker’s idea, Pieterse (2015) agreed that because globalization is led by technological advances, states, regions, and institutions are impacted unevenly.

In contrast, Rao (1999) observed globalization with a binary lens that it is creating new opportunities and also threatening in some ways, especially for underprivileged groups. He asserts that globalization has made it impossible for each nation to sustain independence in economies, politics, and social structures. Whether a society favors the changes or not, it is inevitable to ignore or push globalization that has transformed every sector in society and has influenced the role of national and local boundaries.

Globalization had considerably impacted society at large, and tremendously in higher education and unquestionably brought advantages.

Traditionally, many scholars have identified four different rationales for globalization and internationalization of higher education; economic, political, academic, and social/cultural (de Wit, 1995; Knight & de Wit, 1997; Van de Wende, 2003). These

rationales are practiced at the national institutional, and program levels with different strategic purposes.

First, the economic rationale for globalization was due to the decrease in public support for higher education institutions in which their survival institutions had to seek other sources of revenue. Also, for students, globalization has cultivated new opportunities and jobs, which made institutions reshape their education programs to meet the demands of the employer; to train with appropriate skills and knowledge which in the end will bring more wealth creation to the country (Clarke, 2003). In addition, emphasis on competition and the importance of international reputation is greatly recognized to attract more qualified international, fee-paying students and enhance global partnerships. As Knight summarized, the economic growth and competitiveness, changes in the labor market, financial incentives have been the major economic rationale.

The major political rationales for internationalization were national-building, national security, mutual understanding, social harmony, and maintaining or expanding global power. Marijk van der Wende (2002) explained political rationale as the means for 'nation-building and economic and democratic reform through cooperation. In addition, internationalization facilitates the transfer of expertise and skills that will enhance the international level of the local community.

There are multiple rationales for academic purposes. The major benefit of internationalization is the enhancement of educational quality. Global partnership and research cooperation have provided innovation, research outcomes, and creativity across the disciplines. Moreover, internationalization around the globe has set a certain standard for the higher education institution and upgraded the standards for accreditation which in all enhanced the overall quality of education.

Lastly, is the social/cultural aspect of internationalization, which is for the development, of intercultural competency and global citizenship of students, faculty, and the local community. The social/cultural rationale is important as it creates a more diverse and inclusive culture within the region or institution.

However, globalization has always been tightly intertwined with neo-liberal trends and policies were developed upon the values of neoliberalism and this phenomenon naturally permeated higher education (Eggins, 2003). As a result, the wave of globalization, neoliberalism, marketization ideologies in the combination of potential good has shaped higher education around the entire globe. (Stiglitz, 2002; Eggins, 2003). Greater impact by globalization has raised more interaction with other institutions and lowered the barriers to exchange and interact with different actors and become the knowledge hub in the global knowledge economy.

Rhoads and Szeleyi (2011) identified three distinctive impacts of globalization in higher education at different levels. First, globalization has increased student and scholar mobility. Second, the explosion of knowledge and information exchanges. Third, acceleration of intervention of diverse entities including for-profits and non-profit sectors that would enhance the quality of education and serve the student and faculty.

Over the past several decades, U.S. universities have changed significantly in size, investment, student composition, and overall numbers. In particular, the convergence of globalization and the emergence of knowledge economies has directly influenced higher education (Stromquist, 2002; Altbach, 2007). As a consequence of globalization, higher education has also adopted the global agenda as one of its core values. As Scott (2000) mentioned all universities go through a similar

process of globalization. At times as objects or even victims but at most times they play a key role as the actors of globalization.

The emergence of globalization has created new priorities in higher education. At the university level, globalization is demonstrated by "internationalization", which is embedded across every sphere in higher education from academic programs, research, faculty, students, administrative governance (Stromquist, 2007). However, universities responded differently to globalization and adopt it in a way that is appropriate for its kind. Based upon each institutions' interpretation and conceptualization of internationalization, the tripartite mission of teaching, research, and service has been shaped accordingly (Maringe & Foskett, 2012)

Along with the globalization phenomenon, internationalization is carried out through international activities that have closely intertwined with marketization that has been the biggest major driving force in higher education which transformed institutions' mission statements.

Jean Knight (2004) noted, there will never be a true universal definition of internationalization, and the complex factors of internationalization will be interpreted differently in various ways (Knight 2004). However, there is a widely understood definition of internationalization in higher education. Knight (1999; 2004) has defined internationalization as the process of integrating an international, intercultural, or global dimension into the purpose, functions, or delivery of postsecondary education.

Internationalization has become the basic measure for universities on a global level and is focusing on the mobility of resources and the exchange of ideas between and among nations (Knight, 2004, 2015; Niland 2008). In contrast, globalization is a

more comprehensive phenomenon that stimulates universities to fundamentally exchange in a borderless world. “Concepts of space and location are no longer constraining factors to either the process of production or the process of exchange…. (globalization)…can apply quite easily to many areas of human endeavor, including knowledge production and dissemination” (Marquez, 2002, UNESCO, 2003).

Universities have responded to the demands of a market, producing selective outcomes in pursuit of higher recognition and presence at the global level. This phenomenon is widespread in such an effort to gain recognition in the global rankings (Giroux 2002; Marginson 2007; Orphan & O’Meara, 2016). For many institutions, internationalization has been an instrumental endeavor to pursue individual, institutional, and national economic competitiveness (American Council on Education 2002; Bolen, 2001; Duckett, 2004; Frolich, 2006).

According to the American Council on Education’s study on mapping internationalization on U.S Campuses, seven out of ten research institutions have reported that their mission statements and strategic plans (Helms et al., 2018). Institutions reported internationalization as their top five priorities in their strategic plans. Institutions’ top priority activities for internationalization were 1) increasing study abroad for U.S students, 2) recruiting international students, and 3) partnership with institutions abroad. The concentration of internationalization on campuses was significantly seen in doctoral-level institutions. Internationalizing campuses is an inevitable task for universities in the 20th century. In response to internationalization, across the globe institutions embraced isomorphic trends; expanding English as the primary foreign language or teaching, research, and scholarly publication (Altbach, 2007; Wächter & Maiworm, 2002, 2008).

However, at many times the interpretation of internationalization is often narrow and shallow. One of the public flagship universities proudly posted an article announcing itself as “A top school for global engagement”, ranking in the top ten in the nation, by hosting nearly 10,000 international students and 1,500 scholars (PennState news, 2017). The article only captured the number of international students and scholars as an indication of their achievement of being a globally engaged university. This is a typical announcement of how higher educations have framed their internationalization activities. As internationalization of higher education is viewed in a linear way, some scholars insist internationalization must include ethical principles because international engagement brings new opportunities and benefits for individuals, institutions, regional communities, and the nation.

The market-driven and commercialization of higher education at a global level created a competitive environment that generated winners and losers (Deardorff et al., 2012). Bolsmann and Miller (2008) describe internationalization as “a continuation of former imperial and political connections that have evolved into financially beneficial markets and sources of income for western universities” (p.80).

These phenomena lead directly to the question of whether internationalization of higher education is contributing to the public good, despite many private goods objectives. What requires to be an ethically built internationalization? As a foundation, internationalization in higher education must be built upon, transparency, respect for other cultures, ensure educational quality, mutually beneficial, equally accessible, and support services.

Public Engagement in US Higher Education

As mentioned earlier, many higher education institutions claim to be leading global universities, and institutions have used global engagement to describe their agenda promoting their international activities. Such activities include global rankings, student numbers and faculty mobility, branch campuses, and research contributions. These activities are important for universities because they attract national and global attention that signals their prominence in the world.

This study explores the term and concept of global engagement for broader purposes that are more related to the concept of engagement with the community. Therefore, it is important to understand the concept of community engagement and redefine what global engagement is. This will help to understand the scope of global engagement and know why this study preferred to use global engagement than internationalization. As mentioned earlier, internationalization is undeniable is critical for higher education and the consequences of internationalization in all levels horizontally and vertically across the campus. While universities seek to be a globalized campus internally and externally, the depth and scope of their global society must be examined.

The history of public engagement in higher education began with the aim to make good citizens for the emerging democracy (Hollander & Saltmarsh, 2000). During colonial times, higher education opportunities were open to seminary leaders, and liberal arts colleges were limited to the elites and wealthier group (Bringle, et al.,2009). In the earlier years, teaching was the major task for the universities at leading institutions such as Harvard University and this has continued for several hundred years (Boyer, 1996).

In the 1800s, there were significant shifts when state universities were established. The purpose of a state university was to promote "social improvement and individual happiness" and made noticeable shifts since then. The major shift was the establishment of 'The Morrill Act' in 1862. Which land-grant institutions were built upon the aim to foster economic development, focusing on the teaching of practical agricultural, engineering, and military science. Most of the land-grant universities became large research public universities and became the flagship institution within the region. The Morrill Act became the watermark in establishing the university's mission of public service spreading "the educational good". (Boyer, 1996; Brubacher & Rudy, 1958; Hofstadler & Smith, 1961; Johnson,1981; Rudolph, 1990; Thompson & Lamble, 2000; Veysey, 1965).

Also, the establishment of the land-grant universities became a declaration of commitment to education in a democracy (Bonnen, 1998). Further, it also built public trust by extending opportunities in higher education, creating social and economical benefits to people. By the end of the Civil War, sixty-seven land-grant institutions had been built (Bender & Schorske, 1998). One critical achievement of the Morrill Act was that educational opportunities were opened to students of color.

Overall, the land-grant idea in education included elements of citizenship, service, utility, diversification, and specialization (Lee,1963). The government continuously supported land-grant universities. However, in 1914, the Smith-Lever Act gave permanent funding for universities for the purpose of distributing the results of research to the public (Thompson & Lamble 2000). Due to the widespread support of research and scientific inquiry (Richardson 1996), the land-grant tradition of service declined substantially.

As the land-grant universities concentrated on research outcomes, they also became an ivory tower being more competitive, striving for more resources, recruiting quality faculty, and students, and competing for more federal and state funding. Soon, indicators such as a number of publications became the core indicator of overall academic success.

In the midst of the ivory tower trend, the public began to view universities as "elitist and irresponsible" (Bender & Schoske, 1998). Further debates arose with the perception that universities were becoming more corporatist; many considered higher education as a private good rather than a public good.

However, in the late 1980s, the Carnegie Foundation and Dr. Ernest L. Boyer stood at the forefront of advocating a third mission for the university. Boyer insisted "…linkages between the campus and contemporary problems must be strengthened." He also emphasized that "… a new vision of scholarship is required, one dedicated not only to the renewal of the academy but ultimately, to the renewal of society itself" (Boyer, 1990). This pointed to a new direction for higher education and added a new word "engagement" to encompass service, extension, outreach, and other similar roles (Roper & Hirth, 2005). Further, the traditional concept of 'service' which emphasized unidirectional approaches in delivering knowledge and service to the public, gradually changed to a bidirectional approach (Boyer, 1996; Kellogg Commission, 1999).

The Kellogg Commission raised awareness of the need for educational reform in public institutions of higher education. The commission emphasized seven elements of higher education's covenant with society: access, excellence, participation in democratic processes, research for public needs, the connection

between research and application of expertise to solve problems, accountability, and monitoring (Kellogg Commission, 2001).

Carnegie Classification for Community Engagement

Later in the early 1900s, the Carnegie Foundation was established by an American industrialist and philanthropist Andrew Carnegie. Historically the foundation is committed to serving for the improvement of various areas including higher education. Since 1971, the foundation has developed a classification system to classify colleges and universities by mission, degree level, and specialization. This classification system became a significant framework that classified all accredited two-year and four-year institutions in the US which intended to support research and policy in higher education.

In 2006, the Carnegie Foundation for the Advancement of Teaching created a new elective classification, the “Carnegie Classification for Community Engagement” which is voluntary participation that examines institutions' distinctive commitment in the areas of community engagement (McCormick & Zhao, 2005). This classification aimed to be an evaluative tool rather than a ranking system and every classified institution is recognized nationally.

The first classification including the pilot started in 2006, and the second in 2008, and a third in 2010. From then on, the classification changed to a five-year cycle for classification and re-classification. As of 2020, a total of 359 institutions has been classified. The Carnegie classification defines community engagement as,

> Community engagement describes a collaboration between institutions of higher education and their larger communities (local, regional/state, national, global) for the mutually

> beneficial exchange of knowledge and resources in a context of partnership and reciprocity.

In their application, institutions provide evidence that aligns and best describes their performance. There are several reasons why colleges and universities apply for Carnegie Classification for Community Engagement. The most common reason is that the classification process provides self-assessment and reflecting time on their work. The application process allows institutions to collect dispersed data and establish a cohesive agenda and strategy, since most institutions in the US are decentralized (Saltmarsh & Johnson, 2018). Furthermore, institutions use this opportunity to legitimize their work in community engagement and utilize it to publicly announce their commitment to fulfilling social responsibilities to serve the public good (Saltmarsh & Johnson, 2018).

The classification of institutional engagement concentrates on three areas: *Foundational Indicators*, *Curricular Engagement*, and *Outreach and Partnerships*. The *foundational indicator* consists of institutional commitment and institutional identity and culture. Institutional commitment concentrates on infrastructure, budget, and fund-raising, tracking and documentation, professional development, community voice, faculty recruitment and promotion, student leadership and institutions' strategic plan on community engagement. Institutional identity includes categories such as mission and vision, assessment and data, marketing materials, and leadership priority in community engagement.

On *Curricular Engagement* examines to see to what extent teaching and scholarship and the members on campus and the community are in mutually beneficial partnership. The last area on *Outreach and Partnerships* focuses on resources available for community use.

Higher education institutions redefined scholarship of engagement and began to search for ways to deal with complex social issues in the world, concentrating on engagement that is mutually beneficial for the university and the local and global community partners (Boyer, 1996; Plater, 2011; Weerts & Sandmann, 2008).

Global Engagement in Higher Education in the U.S

There is a lot of literature on the globalization and internationalization of higher education but scarce literature on global engagement that embraces the third mission of the 'service and outreach' component in higher education. Global engagement in this study embraces the concept of engagement with the community that goes beyond their regional boundaries.

Several studies were conducted in regard to global engagement with the focus on study abroad (Jon & Fry, 2021; Millora, 2011; Paige et al, 2009; Shadowen et al., 2015) examined the impact of U.S. long-term study abroad on five dimensions of global engagement: civic engagement, knowledge production, philanthropy, social entrepreneurship, and voluntary simplicity. This study analyzed individuals' undergraduate education experiences abroad and their subsequent participation in global engagement activities. Shadowen et. al., (2015) evaluated study abroad programs and developed a scale to assess campus internationalization, focusing on four specific constructs: cultural engagement; knowledge of the host site; ambiguity tolerance; and diversity openness. Ulrich (2016) explored how the scholarship of engagement encourages different stakeholders on campus to understand the capacities of engaged scholars involved in global engagement in the setting of several rural and urban communities in Africa. Explaining global engagement is

complex. This study embraces the following concepts and approaches to explain global engagement.

Table 1. Diverse Concepts and Approaches on global engagement

Term	Definition	Scholars(s)
Global social responsibility	Understanding of and commitment to improve the welfare of the global community.	Chickering & Braskamp (2009)
University social responsibility	A group of principles or values that guide the organization's mission and activities and considered universities to place a fundamental role in the transmission of ethical principles and moral values to society.	Quezada (2011)
Global perspective	Five dimensions-perspective consciousness, state-of-the planet awareness, cross-cultural awareness, knowledge of global dynamics, and awareness of human choices.	Hanvey (1982)
Cosmopolitanism	All people are connected through shared values and humanity. Recognition of an obligation to others, regardless of differences of culture, race, politics or geographic location.	Appiah (2008,2010); Appadurai (1996); Beck (2006)
Civic engagement	A campus-based activity related to an off-campus issue, problem, or organization. Educating responsible citizens and community leaders and contributing to social and community development.	Saltmarsh, Hartley, & Clayton (2009); Talloires Network (2005)
Knowledge production	Creation of new knowledge by sharing ideas through publication in print or other media.	Paige et.al (2009); Bawa & Munck (2012)
Philanthropy	Participation in volunteer activities or donation of money or assets to organization devoted to the arts, community, education, environment, health, human rights, international development, poverty, religion, social justice, and youth organizations.	Lynn &Wisely (2006);
Global citizenship	Beyond individuals own political community that cares of all fellow human beings.	Appiah (2008); Hartman & Kiely(2014)

Defining the characteristics of global engagement and developing a universally accepted definition is challenging. This can be defined differently for each type of institution. In the internationalized environment on campus, engagement

is extended beyond the local context to the global community through scholarship, research, and service. A globally engaged campus prioritizes global objectives and cooperation through the process known as internationalization (Knight, 20062006). Faculty, researchers, and students are encouraged to crosses borders to volunteer or work with the communities through service-learning programs and projects, research, and other forms that "engage professional or academic expertise in partnership with local expertise to address real-world issues" (O'Meara, 2008).

Many universities are engaged globally in various ways in research, teaching, and public engagement. For example, the father of the Green Revolution, the Nobel laureate Norman Borlaug from the University of Minnesota has greatly contributed to the extensive increase in agricultural productivity worldwide especially in developing countries helping the world's hungry people. Also, the University of Minnesota has collaborated with the Master Card Foundation on a youth entrepreneurship project in three countries in East Africa (Kenya, Uganda, Tanzania) for four years. This project was to educate and train youth, staff, and stakeholders from the local community to value skills and prepare them for employment and help to start enterprises (Master Card Foundation, 2016). In addition, organizations such as the Peace Corps, USAID, and the World Bank directly deal with global community issues.

The scale of engagement also differs according to the type of institution. For instance, a research university puts more weight on research activity than other institutions such as vocational or community colleges which concentrate on the teaching component.

Most of the world's top-ranked universities are located in the U.S. Many universities around the world are attempting to become more like U.S universities

where they are the leading hub for research and knowledge production. The impact of higher education institutions in the community and global society is significant. Acknowledging their role and responsibility as a world-leading institution, it is critical for U.S institutions to reflect on their role in society and search for ways to fulfill their social responsibilities in order to contribute to solving pressing global issues.

Though slow there have been efforts to concentrate on the third mission. Since the establishment of the U.S, Campus Compact in 1985, as of 2018 there are 54 networks and organizations mostly based in North America that encourage community engagement scholarship. These networks have expanded to other parts of the world (See Appendix 1). The major networks and organizations include the Global University Network for Innovation (GUNI), an international network created in 1999, supported by UNESCO, the United Nations University and the Catalan Association of Public Universities. In 2017 GUNI released *The 6th Higher Education in the World Report, 'Towards a Socially Responsible University: Balancing the Global with the Local'.* The report analyzed how universities can contribute to global challenges, and also support the UN's Sustainable Development Goals (SDGs).

Talloires Network hosted the first international conference in 2005 and the conference produced the *Talloires Declaration on the Civic Roles and Social Responsibilities of Higher Education* aiming to strengthen the application of university resources to the needs of local and global communities. As such, networks and organizations increase the awareness of community/civic engagement in the global context by bringing leaders attention together.

Positive and Negative Impact of University's Global Engagement

Global engagement is an ambiguous concept where it is important to acknowledge both positive and negative sides. In this section, the positive impact will be addressed within the context of human capital theory, social capital theory. Whereas the negative impact of global engagement will include academic decency theory, academic imperialism, and university ranking system.

Positive Impact of Global Engagement

Human Capital Theory

Beginning from Adam Smith to economists such as Theodore Schultz and Gary Becker have noted the importance of labor force skills for economic development. The human capital theory is knowledge or competencies that individuals can use to produce economic value ty education and training (Becker, 1964). Individuals who had education assume to be more productive and supportive within the society (Psacharopoulos, 1997). Hence, International Organizations such as the World Bank, OECD, UN, EU have been actively promoting the human capital theory of education in developing countries (Karabel & Halsey1977). Among them, the World Bank has been the largest donor to finance education in developing countries setting their foremost priority to invest in human resources development (Ayres, 2000, p.446). In the 1950s, George Psacharopoulos, a World Bank economist, used returns to investment in education based on human capital theory to invest in education. Based on Psacharopoulous' studies, returns of primary education were found to exceed the returns to secondary and higher education (Psacharopoulos, 1985). This idea was maintained for more than twenty years considering higher

education as a negative effect on equity due to the high costs and low rate of return which later was found to be not true.

Similarly, Theodore W. Schultz, in his book The Economic Value of Education used the concept of human capital and evaluation on its returns (Schultz, 1961). He insisted that that, “measurement of labor contribution output, the productive capacity of human beings is vastly larger than all other forms of wealth taken together” (p.313). Later, the theory amplified through education, learning, and skill formation, and people can become much more productive overall contributing to economic growth. (Barro&Sala-I-Martin(1995), Barro, 1996).

Psacharopoulos and Woodhall (1997) also state the basis of the wealth of nations is composed of human resources. As human beings are the active agencies compared to the capital and natural resources, human beings can build, accumulate, disseminate and carry for the national development. Therefore, it is important to reach out and deliver knowledge to the global society for the purpose of development.

In 1990, during the Jomtien conference the World Bank, UNICEF, UNDP, and UNESCO came with an agreement to present the goal of education for all (EFA). Which aimed to focus on basic education to children, youth, and adults to build ‘human capital’ and eradicate poverty. The ‘human development and the concept of human capital development have been the central paradigm rooted in most of the international organization’s agenda. The main idea is investing heavily in people by providing education is critical for the development of the nation.

Social Capital Theory

Social capital theorists stated the social network as a central economic and cultural capital and adds cooperation, trust and reciprocity produces goods and services for the individual and also for a common good. (Bourdieu, 1977; Coleman, 1988; Jacobs, 1961; Putnam, 2001). The basic concept of social capital is that an individual's social network and engagement are important assets. There were controversies on the concept of social capital in the 1950s to the '60s that social capital is an obstacle to economic development. These controversial arguments were supported by the dependency theorists who perceived social capital as a mechanism of capitalist exploitation (Woolcook & Narayn, 2000).

However, at the same time, many scholars addressed the importance of social networks and civic engagement as a great resource, particularly when confronted with societal issues and making related contributions (Jin & Lee, 2013; Moser, 1996; Narayan, 2002; Sommerfeldt & Taylor, 2013). Coleman and Bourdieu focused on the benefits of an individual or small group as the unit of analysis. Putnam's work (1995), Bowling Alone: America's Declining Social Capital, concerned the declining of collective activities. Putnam expanded upon the ideas of Coleman and Bourdieu to see social capital as a 'stock' by communities and nations with effects that are mutually beneficial. He also added "social capital is a source of social cohesion with individuals and groups that can evaluate community's condition and producer of civic engagement." (p. 27).

With regard to the relationship between social capital and education, L. J. Hanifan in a classic work emphasized the importance of community involvement in successful schools:

> those tangible substances [that] count for most in the daily lives of people: namely good will, fellowship, sympathy, and social intercourse among the individuals and families who make up a social unit....The individual is helpless socially, if left to himself....If he comes into contact with his neighbor, and they with other neighbors, there will be an accumulation of social capital, which may immediately satisfy his social needs and which may bear a social potentiality sufficient to the substantial improvement of living conditions in the whole community. The community as a whole will benefit by the cooperation of all its parts, while the individual will find in his associations the advantages of the help, the sympathy, and the fellowship of his neighbors.
>
> –L.J. Hanifan, 1916

The concept of social capital is applicable at the higher education level. Service-learning and study abroad can be good examples of an individual gaining social capital through various activities.

There are limited studies on the relationship between service-learning programs and social capital, but several studies have acknowledged that social capital is developed by engaging in civic activities (Campbell, 2000; Dufour, 2005; Kahne et al., 2006). Also, D'Agostino (2010) measured the effect of service-learning programs on social capital at a university and found that students who took service-learning classes had a positive effect on the social capital factor.

Another example is engaging in technology in university and community partnerships. Dumova & Fiordo (2010) note by utilizing technology, the university leads transformations in human communication, increases social interaction, development social capital through collaboration and partnership between the universities and community (Dumova & Fiordo, 2010).

Negative impact of global engagement

Academic dependency theory

This theory originated in Brazil in the 1950s, after World War II when Western hegemony was pervasive through their economic and educational infrastructures. Alatas (2003) describe academic dependency or academic neo-colonialism as "a condition social sciences of other countries are placed by the growth and developed of the social sciences of other countries dominance." (p.603)

Dependency creates a hierarchical relationship between the core and other peripheral nations, creating dependent linkages to the economy and culture of the Western nations. (Arnove, Altbach, & Kelly, 1992). The academic dependency also has created inequalities between universities in the core and the periphery nations. Altbach (1987) described five elements that influence these inequalities. First, many of the educational institutions were established by Western colonizers, which influenced the curriculum, pedagogical techniques, and norms. Second, language usage created substantial inequality. For example, in most cases, English is predominantly used by elite social groups that segregate them from the local population (Altbach, 1987, 1988). Next, the periphery nations are usually consumers, not producers of knowledge (Altbach, 1987). The majority of the research, funding resources, and research facilities are available in the West. Thus, this hinders developing countries to develop their own research with indigenous knowledge because it is hard to access critically needed resources. (Altbach, 1998).

Lastly, is the hegemony over the means of communication (Altbach,1987). The major academic journals, publishers, bibliographies, libraries, and accessibility to high technologies are in the West which is challenging for periphery nations to meet the needs. The majority of authors, editors, and audiences of the journal are

mainly from the West. Therefore, issues addressed by the developing countries are often ignored. (Subramani &Kempner, 2002) This is repeated in the academic field that is structured under the old colonial international order. Altbach (1987) further elaborated that the peripheral nations are not only influenced by the Western research, academic system, and governance but ironically also for research and knowledge on their indigenous knowledge. By disrespecting culture and indigenous knowledge, the 'development' is enforced on other parties without considering the context (Andrews & Okpanachi, 2012).

Academic imperialism

Education has always been influenced by external forces. Academic imperialism began in the colonial period where colonizers had directly influenced colonies' schools, universities, and research. Alatas (2000) describes this phenomenon as 'the political and economic structure of imperialism generated a parallel structure in the way of thinking of the subjugated people'. He asserted there are six main trains of exploitation, tutelage, conformity, secondary role of dominated intellectuals and scholars, rationalization of the civilizing mission, and the inferior talent of scholars from the home country specializing in studies of the colony. In the past, the colonial powers had direct control over the political, social, and economic system, whereas now, it is influenced by the power of international commercial banks and multinational corporations, international aid organizations, and educational institutions.

In higher education, community service-learning and study abroad programs are one of the major experiential learning programs for students. Despite the benefits they bring some argue that it is important to scrutinize the fundamental structure.

The pedagogy of critical community service-learning points to the power and systemic inequality and its political nature of education (Santiago-Ortiz, 2019). Similarly, this applies to study abroad programs (Taranath, 2019)

University ranking systems

In the midst of neoliberal globalization, one of the notable features in higher education is the recognition of the ranking system. (Dill 2009; Shin and Harman 2009). The Ranking system was created to measure the quality and the effectiveness of higher education. Astin (1993) defined quality and excellence as, to what extent of institutions achieving the intended goal, fulfilling innovation, competitive, productivity, high standards of student and faculty performance, responsiveness to society. In all, measuring the improvement of all kinds.

There is the assumption that top ranked institutions are highly productive, with better quality in teaching, research, and service to the community than lower ranked institutions (Shin & Toutkoushian, 2011).

However, this is not always the case because current ranking measurements are over-weighing on particular easily measured outcomes such as numbers of publications, research resources, and patents (Gould, 19811996). The fundamental dimensions – to teach, research, and service component are not appearing in the current ranking system. Moreover, it is extremely difficult to measure the true quality and effectiveness of the university because the priorities can be different based on the types of the institution. Therefore, many scholars have criticized knowledge production as being the commercialization and marketization of universities (de Sousa Santos, 2006; Marginson, 1997). Also, a ranking system created tension between the needs of a local institution and global trends.

As shown in the Table.2, there are three dominant ranking systems today. Looking closely at the indicators, it clearly shows the imbalance of the measures. All of the ranking systems heavily emphasized the research outcomes. The proportion of research for the Times and the QS was 60% while the Shanghai Jiao Tong being the most extreme counting 100% on research outcomes. None of the ranking systems had indicators on the third mission, service, or engagement to the society.

Table 2. Factors comprising three influential ranking systems

The Times	%	QS	%	Shanghai Jiao Tong	%
Teaching	30	Academic Reputation	30	Quality of Education (Alumni winning Novel Prize)	10
Research (Volume, income & reputation)	30	Employer Reputation	20	Quality of Faculty (Novel Prize & highly cited)	40
Citations (research influence)	30	Student to Faculty Ratio	10	Research Output (Nature & Science, SSCI)	40
International Outlook (staff, students, research)	7.5	International research network	10	Per Capita Performance	10
Industry income (knowledge transfer)	2.5	Proportion of international faculty and proportion of international	5		
		Proportion of inbound exchange students and proportion of outbound exchange students	5		
Total	100		100		100

Sources: *The Times*, QS, Shanghai (2020)

It is extremely challenging for institutions to measure the exact quality of education. For instance, in the case of teaching, all universities use their own course evaluations that cannot be directly compared with other institutions (Shin, 2011). Some use the market mechanism the Times QS rankings use the results of an employer satisfaction

survey to rank for teaching quality. Also, some use student experience surveys like the National Survey of Student Engagement (NSSE), in the U.S, College Student Experience Questionnaire in Australia, and Teaching Quality Assessments in the UK to measure the teaching quality of the institutions.

In the case of measuring the research component, most of the ranking indicators include the number of research publications or citations produced by faculty, or the amount of external research funding obtained for research (Johnes, 1988). This is debated among scholars because the number of publications does not directly reflect the quality of research productivity (Toutkoushian et al., 2003).

The neoliberal globalization impact is easily shown in the ranking systems, for instance, the internationally refereed journals that are monitored by the Institute of Scientific Information (ISI) or SCOPUS, do not include journals from non-English speaking countries (Shin & Harman, 2009; van der Wende & Westerheijden, 2009). It is obvious that there will be great numbers of publications from English-speaking countries mostly from North America. Second, measuring the quantity of the publications does not necessarily reflect the quality or the impact of the research.

Last but most importantly, the quality of the third mission has been devalued and not reflected in the ranking system, even though service and engagement are one of the three main functions of higher education institutions.

Measuring the quality-of-service component is also difficult, while some say that it is partially reflected in teaching and research. However, the current ranking system shows that the third mission of the university is missing which can discourage the university to be actively engaged locally and globally.

Recently, in 2019, the Times Higher Education introduced a new ranking system measuring universities' social impact especially institutions’ performance on

the UN's Sustainable Development Goals. The metrics also included policies on academic freedom, In the first round, 450 universities from around 76 countries were in the ranking. Surprisingly only eight universities were from the US among the top 100 universities.

Conceptual and Theoretical Framework

Conceptual Framework

Fishbone Diagram

For this research, a Fishbone diagram is used to illustrate global engagement. The *Fishbone* diagram or *cause and effect diagram* is also known as an *Ishikawa* diagram. The fishbone diagram was introduced in 1920 and later disseminated in the 1960s by Kaoru Ishikawa to study the quality management process. This diagram is often used in the business and management field to map out the foundational cause of the problem. This diagram is a useful graphic tool to illustrate the relationship between the dependent and independent variables. (Slameto, 2016).

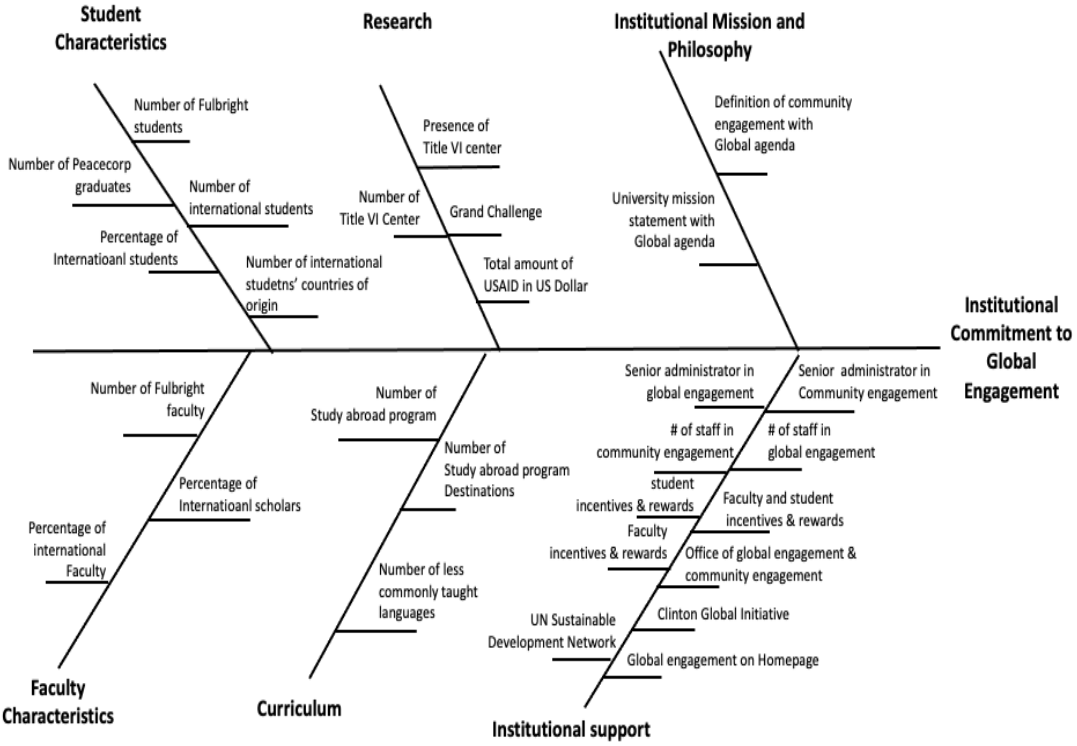
The diagram is named as a fishbone because the shape of the diagram looks like a fish skeleton. The head shows an effect or outcome, and the body in a form of bones shows the causes (Tiann, 2012). This diagram is helpful to understand the cause and effect of an issue and the underlying effect of the process of the cause. Often when this method is chosen, there are multiple factors contributing to the outcome.

As shown in Figure 1, the head of the fish (effect, dependent variable) is categorized as "institutional commitment to global engagement." The large and small

bones of the fish body (causes, independent variables) demonstrate variables at a different level influencing institutions' commitment and factors related to global engagement. However, it is complex to identify the exact cause and effect relationship of factors with global engagement in higher education. Thus, the focus, here is on the identification and examination of statistical associations.

The following section describes each variable that affects institutions' commitment to global engagement to show both the macro and micro components. There are six major dimensions: 1) student characteristics; 2) faculty characteristics; 3) curriculum; 4) research; 5) institutional mission and philosophy; and 6) institutional support along with 28 variables that were developed based on the previous research described in chapter two.

Figure 1. Fishbone diagram



The variables shown above include important factors toward an institutional commitment to global engagement. Most variables were chosen based on the

previous studies focused on the internationalization of higher education (e.g., Knight, 2004, Horn, Hendel & Fry, 2007). However, there are hardly any studies that have considered all of these variables to measure and review the components of global engagement. Therefore, this study is at an exploratory stage and is a first attempt to incorporate the inclusion of variables that previous studies have identified as having a relationship to universities' commitment to global engagement.

Due to the challenges of completing the full data set, variables initially planned to include such as a number of service-learning courses or internal research funding on global engagement had to be eliminated. All above-chosen variables were chosen as they were publicly available.

Student Characteristics

Student engagement is the key to student success (Kuh et al., 2008). The following characteristics include Fulbright students and scholars and capture students' involvement in international education and the diversity within the campus.

For student characteristics, the domain is composed of five variables: number of Fulbright students, number of international students, percentage of international students, number of international students' countries of origin and number of students becoming Peace Corps volunteers. These variables are drawn from Horn, Hendel, and Fry's (2007) study.

(1) Fulbright students

The dominant activities of the Fulbright program include provided grants or contracts for educational or cultural exchanges, student and faculty exchanges, research opportunities, and deliver studying and teaching opportunities. Since 1964, through the Fulbright program, students from undergraduate and graduates in 160

countries and over 390,000 people from the U.S and other countries have participated.

Fulbright has been a leading scholarship program to promote global engagement and train students to be globally competent. The grant is given to support study/research including projects such as English teaching assistant programs for one academic year outside the U.S. The program provides excellent opportunities to experience a different culture. Fulbright is a highly competitive program only given to selective students each year.

Fulbright programs allow students to build intercultural competence, expand social capital, and advanced their language skills. One of the major selection criteria of the program is language preparation and the potential for developing a deeper understanding of the host nation and community.

(2) International students

International students play a significant role in higher education in various ways, politically and economically. For decades, they have been the frontiers enriching intercultural experiences on campus providing abundant resources to U.S institutions. International students' social interaction contributes to diversity in culture in class and enhanced intercultural competency for local students which leads to internationalization in the home environment. On-campus social events, language exchanges and living together in dorms, meeting international students broaden views of local students. The regional community also benefits from international students as they help them to expand their views and bring diverse knowledge and language skills to serve their community.

(3) Peace Corps Volunteers

This program aimed to send American citizens mostly to college students to serve two years in developing countries in the fields of agriculture, environment, community economic development, health, education, and youth development. The Peace Corps experiences provide opportunities for the volunteers to engage deeply and learn about other cultures and develop their intercultural competence and enhance awareness as a global citizen (Glass et al, 2015). Higher education institutions encourage students to take the advantage of Peace Corps opportunity. Some institutions provide a prep program that allows students to build language skills, intercultural competence and global citizenship, professional and leadership development they would need in advance.

Faculty Characteristics

The faculty characteristics domain is composed of two variables: the number of Fulbright faculty and the number of international faculty. These variables are drawn from Horn, Hendel, and Fry's (2007) study.

(1) Fulbright faculty

The Fulbright U.S scholar program provides teaching, research, or for teaching/research combination from two to 12 months. Fulbright Scholar Program provides the opportunity to make a great global impact through their academic expertise. Faculty play an important role to shape students' learning experiences by teaching, developing curriculum, moderating classroom interactions, and advising. Therefore, many scholars emphasize the role of the faculty and the importance of having intercultural competence, experiences, and knowledge on international perspectives (Carter, 1992; Gaudiani, 1998; Goodwin & Nacht, 1991; Green, 2002).

In many cases, faculty engagement in internationalization is not much emphasized at an institutional level but engaged at an individual level. However, opportunities like Fulbright permit faculty to develop international perspectives by teaching and research abroad and build connections with peer scholars in other countries. Faculty with such experience will create a "multiplier effect" on campus and bring abundant resources that will permeate into curricula, teaching and research.

(2) International faculty

Since the 1990s, the number of international faculty in American universities has increased. There are around ten percent of foreign-born faculty in the U.S. International faculty are defined as a person who is non-US citizens. International faculty are mostly found at doctoral or research extensive institutions but are found at all institutional levels. Often, international faculty hired in American institutions are the top elites who bring diverse intercultural consciousness and high levels of talent into the academy. Many earning the Nobel Prize in the U.S. were born outside the U.S. (Abrams, 1988). International faculty are viewed as the key drivers to enhance comprehensive internationalization on campus. Faculty with intercultural experiences support students to be exposed to skills and knowledge to gain global competence. Gopal (2011) emphasizes the role of faculty to teach in a cross-cultural environment. It is important for faculty to obtain intercultural competencies that include openness to other cultures, cultural self-awareness, language abilities, and cross-cultural skills (Gopal, 2011).

Research

The research domain is composed of three variables: the presence of Title VI centers, amount of USAID funding, and participation in Grand Challenges. These variables are drawn from Horn, Hendel, and Fry (2007), and Nowell et al, (2020).

(1) Title VI centers

The VI centers were established by the U.S Department of Education, as part of the Higher Education Act of 1965. The centers were created to strengthen and develop international education including foreign language, area studies, international studies, and research. The initial purpose of this program was to secure national security by educating Americans to understand international relations to better deal with geopolitical issues.

Through these centers, grants were given to undergraduate and graduate students, teachers, faculty, administrators, and higher institutions and gave opportunities for students to expand global competency by connecting their professional disciplines to area studies. This type of program supports people to be exposed to diverse culture and have greater perspectives beyond their territorial boundaries.

(2) USAID funding

For many decades, USAID has been actively engaging with US universities in international development work across the disciplines. This partnership began in 1949 with Truman's Point Four program which is made to deliver technical knowledge particularly in agriculture, education, and public health fields for developing countries (USAID, 2020). In 2006, USAID initiated the Higher Education for Development (HED) which is a model that pairs U.S institutions with

institutions in developing countries to respond to the needs of the developing countries needs by collaborative research, training, educational programs, and community outreach (USAID, 2020). Through this program, more than 350 higher education partnerships have been established in 61 countries in140 US institutions.

USAID grants are usually given for research, community engagement, and capacity building that can be mutually beneficial for both university and developing countries (USAID, 2018). The grant from USAID becomes important external fund for the university and USAID benefits from the university's expertise, knowledge, and technology. USAID provided grants that promote opportunities not only for faculty but students and staff to engage with global society and fulfill responsibilities as global citizens.

(3) Grand Challenge

The Grand Challenge is a research initiative that was first introduced in the 1900s by the German mathematician David Hilbert (Singer & Brook, 2011) to solve 23 unsolved mathematical questions that have been troubling mathematicians for decades. After 100 years later, the National Academy of Engineering (NAE) has announced the "Grand Challenges for Engineering" for the 21st century to tackle societal and global problems. Later in 2012, the scope of the grand challenges extended to other fields including economic and social development, global health, chemistry, environmental sciences, and genetics and genomics.

The grand challenge is sponsored by various organizations such as the National Institutes for Health, the United Nations, the National Institutes for Health, and the Bill and Melinda Gates Foundation. Universities participate in grand challenges initiatives to solve regional and global issues by providing opportunities for different

sectors national research centers, business and civic organizations, and academic institutions to collaborate. Some universities include a regular curriculum so that students have the chance to involve in research projects. For example, the grand challenge for engineering offers the National Academy of Engineering Grand Challenge Scholar Program that is combined with the curricular and extra-curricular programs and a total of US 74 universities participate in the program.

Curriculum

The curriculum domain is composed of three key variables: number of study abroad programs, number of study abroad destinations, and number of less commonly taught languages. These variables are drawn from Horn, Hendel, & Fry (2007)'s study.

(1) Number of study abroad programs and study abroad destinations

Study abroad is defined as an educational program that takes place beyond geographical boundaries (Kitsantas, 2004). Study abroad programs are often offered to both undergraduate and graduate students directly through university or external entities. During the 2017-2018 academic year, the number of U.S students studying abroad for credit was 341,751 students which are about 1.7 percent of all U.S students enrolled at higher education institutions and about 10 percent of U.S graduates (NAFSA, 2020).

Scholars found study abroad programs beneficial, especially the development of global competencies and intercultural skills (Deardorff, 2011; Engle & Engle, 2004; Salisbury, 2011). Stebleton et al. (2013) conducted a study on the impact of study abroad programs and correlations of students' intercultural skills and global competencies using the Students Experience in the Research University (SERU) survey. The study defined intercultural skills and global competencies into five areas:

(1) the ability to work with people of other cultures, (2) understanding the complexity of global issues, (3) being able to apply disciplinary knowledge in a global context, (4) foreign language competency, and (5) being comfortable working with people from other cultures. The study found students who participated in a study abroad program scored higher in all areas.

There are different types of study abroad programs. There are faculty-led programs, student exchange programs, language learning programs, research, internships, service-learning, and third-party sponsored programs. Depending on the type of program, they are in the range of two weeks to one academic year.

While sharing similarities with various types of study abroad programs, service-learning has a different angle that shapes the program. A typical study abroad programs offer opportunities for an individual to develop their skills and experiences while service-learning emphasizes reciprocal learning for both students and faculty and counter community members (Calderon & Farrell, 1996; Jacoby, 1996; Porth, 1997). Also, service learning provides important learning outcomes that enhance civic participation or social responsibility as an important component of learning (Eyler & Giles, 1999; Kolenko et al., 1996; Newmann, 1990). Therefore, this study tried to capture the data for service-learning programs; however, there were data available publicly. Hence, the total number of study abroad programs have been included in the data set.

(2) Less commonly taught languages (LCTLs)

Less commonly taught languages (LCTLs) were designed to offer non-traditional languages in US universities which excludes the “big three languages” Spanish, French, and German. LCTLs are also called critical languages that were initiated to

educate students and teachers for the purpose of national security. LCTLs include languages such as Arabic, Chinese, Dari, Filipino, Hindi, Japanese, Korean, Pashto, Persian, Swahili, and Turkish. Scholars emphasize the importance of learning other languages as a way to develop global competence/intercultural competence (Bennet, 1997; Deardorff, 2011). There is also evidence that suggests that multilingual minds contribute to creativity.

Institutional Commitment

The institutional characteristics domain is composed of ten variables: presence of senior administrators in international affairs and public engagement, a number of staff in international affairs and community engagement, student and faculty incentives, participation of Clinton Global Initiative University Network and US Sustainable Development Solution Network. These variables are drawn from Ball & Olmedo (2011), and Brugman et al, (2019), Horn, Hendel, & Fry (2007)'s, Furco (2010), study.

(1) Presence of senior administrators in international affairs and community engagement

The presence of senior administrators in international affairs and/or global engagement is an important factor to accomplish comprehensive internationalization (Bartell, 2003; Goodwin & Nacht, 1991; Hudzik, 2012, 2015; Mestenhauser, 2011). Senior administrators manage and strategize overall operations around global engagement and strive to institutionalize internationalization on campus. Senior administrators adopt different approaches based on their institutions' mission and priorities on global engagement.

Senior administrators' responsibilities include setting global agenda, overseas from mission statements to international partnerships, research and business collaborations, international student administrations, and sending and receiving students to and from other countries. In many cases, senior administrators closely connect with academic deans across the campus.

Their position has different titles at different institutions– some are titled as directors, deans, assistant or associate vice-presidents or provosts. Having a senior administrator is a way for institutions to demonstrate a commitment to internationalization.

(2) Number of staff in international affairs and community engagement

The role of international affairs varies from international students' academic advising, support visa-related issues, manage various exchange programs, provide training and education to facilitate international education, and analyze and research international education-related issues. They are one of the primary contact points for students and scholars on international education-related issues and play an important role in encouraging students to be successful globally engaged on and off-campus.

Along with faculty, the staff is a key player to strengthen internationalization at the home process (Beelen & Jones, 2011) through both formal and informal curriculum. With the assumption that not every student will be able to travel abroad to have global experience institutions invest in ways to increase opportunities for students to be globally engaged on campus.

Similar to the presence of senior international administrators, the number of staff at international affairs shows the commitment toward global engagement because staffing is directly related to the budget. As the resource dependency theory

shows, the organization structure is much influenced by the allocation of resources (Casciaro & Piskorski, 2005).

It is often true that the number of staff reflects the wealth of the institution as well. Yet, the scope and the depth of international affairs staff's involvement vary upon institutions' perceptions and availability of resources. The number of staff in an organization shows institutions' commitment, and also reflects the usage of universities allocation within the limited resources available.

(3) Student and faculty incentives and rewards

Institutions that are more committed to public engagement offer opportunities to participate in community-based research activities such as "Grand Challenges" and acknowledge them by rewarding civic engagement awards and prizes for their contributions and outstanding leadership. This rewarding system creates a cordial culture for institutions to embed service in their tripartite missions and expand students' capacity for social responsibility, broaden student awareness, and build civic-mindedness beyond their regional boundaries. Student incentives and rewards are given in different formats by providing financial rewards, offer special training and educational opportunities, and being acknowledged in different levels from department level to the president and governor's level.

(4) Faculty incentives and rewards

Faculty are the key drivers to institutionalize both internationalization and public engagement on campus. It is almost impossible for the university to implement strategies without faculty involvement. Many scholars emphasize the role of faculty in implementing global engagement on campus. Boyer (1990) stated the role of faculty has changed over time from managing traditional duties from teaching, and

then to research and to providing service. Faculty now compete with these duties and involvement in public engagement activities in different ways. Some with individual value desiring to serve the community and to fulfill their teaching and research agenda through outreach and service (Holland, 2016). Other faculty participate in outreach related activities due to incentives or rewards available or support institutions' commitment to public engagement (Holland, 2016).

Institutions give different types of incentives and rewards at different levels such as financial incentives; public recognition of their commitment, awards, provide funding for a program or research, etc.

(5) Clinton Global Initiative (CGI) University Network

Established by the Clinton Foundation, this university network is a group of higher education institutions committed to educate and train students to be future leaders to combat wicked issues around the globe. As of 2020, 67 universities were members of the network. Institutions listed in this network show their commitment to foster students to be globally engaged and expand global citizenship.

(6) UN Sustainable Development Solution Network

This network was established in 2012 to achieve the Sustainable Development Goals (SDGs). The main purpose of this network is to gather collective effort of knowledge hub institutions including universities, research centers, and other organizations to (1) support local governments to understand and address sustainable development challenges (2) develop research collaboration and education network to advance sustainable development and (3) review and promote solution initiatives and develop

long-term goals. As of today, 163 U.S institutions have joined the network to play a vital role in committing to achieve SDGs.

Institutional Mission

The institutional mission domain is composed of two variables: definition of community engagement with global agenda and university mission statement with global agenda. These variables are drawn from Furco's study (2010).

(1) Definition of community engagement with global agenda

The Carnegie definition of community engagement is the "collaboration between institutions of higher education and their larger communities (local, regional/state, national, global) for the mutually beneficial exchange of knowledge and resources in a context of partnership and reciprocity" (Carnegie, 2011). In many cases, institutions indicate their initiatives, scope, strategies along with the descriptions differently based on how they define the community. Often, the definition of community engagement is closely aligned with their activities and programs. Many universities define community engagement in their websites to describe their mission and strategies to provide a clearer understanding for different stakeholders on and off-campus. Therefore, it is easy to identify whether universities go beyond their regional boundaries to commit to improving global well-being.

(2) University mission statement with global agenda

Universities and colleges have similar mission statements but differ by their function and roles. Most cases of statements over institutions' commitment to teaching, research, and outreach. The mission statements of universities show their commitment to certain values or strategies to deliver a message to within and outside

communities. Scholars describe mission statement as the strategic planning and future 'vision' for the institutions (Carruthers & Lott, 1981; Keller, 1983; Lenning & Micek, 1976; Martin, 1985; Nanus, 1992; Schwerin, 1980). The major benefits of mission statements are that it helps members in the organization to identify institutional priorities and essentials and share common values and characteristics that motivate and inspire internal and external communities (Morphew & Hartley, 2006). Some criticize the presence of mission statements as being organizational artifacts or ritual mythological that are often vague and obscure. Nonetheless, it is considered as important guidance that directs and shapes institutional identity (Morphew & Hartley, 2006).

All institutions' tripartite mission aims to pursue academic excellence and rigorous research capacity. In the case of outreach, it was relatively clear to determine whether an institution embraces the global community as its boundary to engage (Morphew and Hartley, 2006).

Theoretical Framework

Resource Dependency Theory

For higher education institutions, sustaining balanced revenues and expenses is a big challenge. Some major sources of revenue are state appropriations for public institutions, tuition, research grants, gifts, auxiliary revenues, endowments, public/private partnerships, and partnerships with local government.

Resource dependency is a theory introduced by Jeff Pfeffer and Jerry Salancik that explains internal organizational behaviors and power relations between organizations and external forces (Pfeffer & Salancik, 1978, 2003). Resource dependency theory was often used in organizational management but extended to

sociology to education, health care, public policy, and other disciplines (Davis & Cobb, 2010). Davis and Cobb described three main core ideas that embodied resource dependency theory: "(1) social context matters; (2) organizations have strategies to enhance their autonomy and pursue interest; and (3) power is crucial for understanding internal and external actions of the organization" (Davis & Cobb, 2010, p.23). External constituencies may exert power by pushing organizations to implement such practices and policies by regulating resource allocation (Pfeffer & Salancik, 1978). Contrarily, the organization also works to maintain power and control over its resources, reducing dependency on external forces. Thus, this theory emphasizes the mutual processes of interaction between organizations and environments.

Some scholars in higher education used resource dependency theory to explain the important role and impact state funding plays in U.S higher education (McLendon, Hearn, & Mokher, 2009). The decline in state funding and increase in competition has significantly impacted four-year, public institutions (Duderstadt & Womack, 2003), public support for especially for state institutions has been closely associated with the economic environment of the state (Brown and Gamber, 2002; Duderstadt & Womack, 2003).

Leslie and Slaughter (1997) illustrated resource dependency theory to explain the relationship of decreasing state appropriations and raising state accountability measures for public higher education drives to more concentrated power on college campuses. Titus (2006) also used this theory to explore the impact of students' persistence in institutions' financial context. Mwangi (2013) applied this theory to examine how state funding influences international student enrollment in higher education institutions. Weerts (2014) adopted resource dependency theory to

understand how institutions vary in different levels of state appropriation and how that influences university-community engagement practices and perceptions.

Though it is difficult to identify the direct impact of different types of financial support in higher institutions' global engagement, this theory is relevant to this study to examine the impact of federal, state, and private funding on a university's global engagement agenda.

Summary

The review of the literature focused on summarizing various dimensions of internationalization and global engagement in higher education. Numerous theoretical and empirical studies have been examined to explain the rationale and transformation of internationalization and public engagement over time in US higher education. Also, it is crucial to be aware of both positive and negative impacts on global engagement.

This section has adopted the Fishbone diagram to illustrate the holistic structure and potential factors that might reflect universities' global engagement activities. Also, the resource dependency theory was adopted to examine whether various types of funding is associated with global engagement. The next chapter describes the research design that guides the data collection and analysis processes of this study.

CHAPTER 3

METHODOLOGY

The main purpose of this study is to explore and develop an instrument to measure U.S. research universities' global engagement. For this, the 28 variables associated with global engagement are used to construct the index. This study is significant since the previous research has not explored the relationship among the variables in the literature. Therefore, this study developed a means to newly organize and categorize that the variables. The key features of this instrument will give an idea for institutions to redesign their strategies and agenda if they aim to be an institution committed to a global community.

The index is designed to focus on the global engagement of research universities in the U.S. Three tiers of institutions were selected. The sample of institutions in this study includes 110 research institutions that were classified as a research-intensive institution by the Carnegie Classification. These higher education institutions are nationally recognized to be highly committed to serving the national/state and global community.

The formation of the index is based on a series of analyses. A descriptive analysis was conducted to provide a profile of U.S. research universities' global engagement by ranking institutions by the level of global engagement. A psychometric item analysis was conducted to establish the reliability of a potential index of global engagement. An exploratory factor analysis was conducted to investigate the internal structure underlying the index and to guide the removal of items that load on the wrong factor or cross-loaded on multiple factors. Lastly,

multiple regression analyses (OLS) were conducted to examine the possible variables that influence institutions' level of global engagement.

Methods of Data Collection

Two primary methods are used for this study:

1) A narrative synthesis of the literature related to global engagement and related issues.
2) A quantitative analysis of data from three tiers of research universities in the U.S.

The unit of analysis in this study is composed of research/doctoral institutions in the U.S that have been identified and classified by the Carnegie Foundation. The Foundation identifies three levels of doctoral universities: moderate research activity, higher research activity and highest research activity.

In addition, the Carnegie Foundation also classifies institutions that have a strong commitment to making community and public engagement a central feature of the institution's academic and scholarly priorities.

The Carnegie Foundation classified institutions of higher education since the early 1970s. The classifying was implemented for the improvement of undergraduate education and created the *Carnegie Classification (Basic Classification)* which organized institutions by mission differentiation, degree level, and specialization. In early 2000, the foundation created *'Elective' Classification on Community Engagement* differs from the basic classification. This is voluntary participation focuses on three major areas: foundational indicators (institutional commitment and institutional identity and culture), curricular engagement, and outreach and partnerships. This is not a ranking tool but is evaluative and successful campuses are noted publicly by the foundation (Saltmarsh, & Johnson, 2018).

For this study, the full list of institutions that have secured the Carnegie Classification for Community Engagement was established. Out of total of 359 research institutions that are Carnegie Classified for Community Engagement, 142 are doctoral-granting research institutions. In regard to research intensiveness, the sample includes research universities classified as moderate [n=25], higher [n=53], highest [n=65]. Out of 143 institutions, 29 institutions were re-classified. Also, four institutions (East Tennessee State University, University of Tennessee-UT Institute of Agriculture, Jackson State University, UNC- Charlotte) were dropped due to many missing data. In total 110 institutions comprised the final sample due to missing data.

Data Sources

The data sources included applications submitted by institutions to secure the Carnegie Community Engagement classification, available reports on institutions' public and global engagement, and institutional details pertaining to the 28 variables pertinent to this study. These data sources were collected from multiple websites including applications of Carnegie Classification for Community Engagement, university websites, IPEDS, Peace Corps, Fulbright, and ranking systems.

These data sources were then organized and applied to three existing relevant frameworks: (a) Horn, Hendel, and Fry's (2007) *Ranking the international dimension of top research universities in the United States*, and (b) Furco (2010)'s *Rubric for Assessing the Institutionalization of Community Engagement in Higher Education;* and (c) the Carnegie Foundation's (2015) framework for the *Carnegie Classification for Community Engagement.* Indicators and components from these frameworks that were relevant for use in this study were selected.

Horn, Hendel, and Fry (2007) aimed to measure the internationalization of 77 top U.S. research universities. The authors created 19 indicators of the internationalization pertaining to student characteristics, scholar characteristics, research orientation, curricular content, and organizational support. Based on the literature review the authors created 19 indicators with five subcategories. These data were standardized, weighted by a panel of experts, and used to develop an internationalization index score for each institution (See Table 3).

Table 3. Categories, indicators for research universities' internationalization

Category	Indicators
Student Characteristics	1. Percentage of international students on campus* 2. Number of Marshall and Rhodes scholars 3. Number of student Fulbright Fellows* 4. Number of Peace Corps volunteers* 5. Percentage of study abroad participants* 6. Percentage of foreign language graduates
Faculty and Scholar Characteristics	7. Number of faculty who have been Fulbright scholars* 8. Number of Fulbright scholars from other countries* 9. Percentage of international faculty, instructors, and research associates on campus
Research and Grants	10. Number of Title VI centers* 11. Number of Ford Foundation grants 12. Number of FIPSE international education grants 13.Number of campus centers focused on international research *
Curriculum	14. Number of Less Commonly Taught Languages (LCTL)* 15. Language requirements for the bachelor's degree 16. International perspective requirements for the bachelor's degree
Institutional Characteristics	17. Visibility of international content on institutions' websites 18. Presence of a senior administrator for international activities* 19. Number of books in the university library's international collection

Source: Horn, Hendel & Fry (2007)

Horn, Hendel, and Fry (2007)'s research was selected this important work created a set of indicators to measure internationalization that is different from typical measurements that heavily and narrowly focus on research indicators. The indicators

used in the study are relevant to the current study since they included international characteristics that relate directly to global engagement components. The authors cite Green (2003), who described the internationalization of a university as "an undergraduate education… must produce graduates who will be productive contributors to civic life both locally and globally and understand that the fates of national, individuals, and the planet are inextricably linked" (p. 7). They also emphasize the importance of concentration of undergraduate students' knowledge production that develops intercultural competence for the greater service to society, and for greater social responsibility. Among the 19 indicators, 12 indicators were included that are relevant for this research, such as the number of Fulbright fellows and number of Peace Corps volunteers (see indicators with *).

Furco's (2010) framework illustrates five dimensions needed for the advancement and institutionalization of engagement: philosophy and mission; faculty involvement and support; student leadership and support; community partnership, involvement, and leadership; and institutional support and infrastructure. Built on an initial study of 43 U.S. higher education institutions (Bell et al., 2000), and revised and refined over the course of subsequent studies, the framework's five dimensions, composed of 23 components, identify factors that promote the institutionalization of community engagement within a higher education institution (See Table 4). As Furco (2010) describes, a fully engaged university incorporates community engagement into all aspects its mission (i.e., research, teaching, and service) and it sets standards of excellence and strong support for engaged scholarship within academic departments and disciplinary cultures. Various subsequent studies that have incorporated this framework have verified and validated its components and

dimensions as crucial for the institutionalization of engagement and the building of an engaged campus (Gelmon et al, 2004; Hutson et al, 2019).

The dimensions in Table 4 provide a model for this study as they provide a validated structure of institutionalization of an engaged university. For the purposes of this study, some of the individual indicators, such as the components focus on levels of community participation and partnership (i.e., dimension IV) were eliminated since they are difficult to quantify and measure, and institutional standardized data that allow for cross-institutional comparisons on these components were not available.

Table 4. Five dimensions and 23 components related to global engagement (2010)

Dimension	Components
I. Philosophy and mission of community engagement	- Definition of community engagement* - Strategic planning* - Alignment with institutional mission * - Alignment with educational reform efforts
II. Faculty support for and involvement in community engagement	- Faculty knowledge and awareness - Faculty involvement and support* - Faculty leadership - Faculty incentives and rewards*
III. Student support for and involvement in community engagement	- Student awareness - Student opportunities* - Student leadership - Student incentives and rewards*
IV. Community participants and partnerships	- Community partner awareness - Partnerships built on mutual understandings - Community voice and leadership
V. Institutional support for community engagement	- Coordinating entity - Policy-making entity - Staffing - Funding - Administrator support - Departmental support - Evaluation and assessment - Long-term vision and planning

Lastly, I examined institutional applications that institutions submitted for the Carnegie Classification for Community Engagement. As was described previously, the classification is not a ranking tool, but is an external review of how successful institutions are at making community engagement a central component of their overall academic culture and scholarly endeavors. The following indicators (see Table 5) identify institutions' commitment to community engagement. As noted previously, the foundation does not require institutions to indicate specifically their engagement in a global context. With the word limits to each section (approximately 500 words for each indicator), it is up to the institution to decide their priorities on what to include in the application.

Table 5. Carnegie classification for community engagement framework (2015)

I. Foundational Indicators	
A. Institutional Identity and Culture	- Mission statement - Formally recognize community engagement through campus wide awards and celebrations - Systematic assessment - Marketing materials (website, brochures, etc.) - Leadership of the institution (President, Provost, Chancellor, Trustees etc.) priority
B. Institutional Commitment	- Campus-wide coordinating infrastructure (center, office, etc.) - Internal budget - External budget - Fundraising - Investment in financial resources - Campus-wide tracking or documentation - Impact measurement - Impact on students - Impact on faculty - Impact on community - Impact on the institution - Professional development support for faculty/staff - Input from community - Search/recruitment of faculty with expertise in community engagement - Institutional level policies for promotion - Reward in teaching and learning/scholarship/service - College/school and/or department level policies for promotion

	- Community engagement: - Noted on student transcripts - Connected with diversity and inclusion work - Effort on student retention and success
C. Supplemental Documentation	
II. Categories of Community Engagement	
	- Curricular engagement - Outreach and partnerships

Data Analysis

Phase one: Document review

The review of documents involved an examination of archival, retrospective, and the most recently updated data related to global engagement. Archival data included the applications of 114 Carnegie Classification on Community Engagement of doctoral level research universities. The data were obtained from the Swearer Center at Brown University. Brown University's Swearer Center is the entity that approves national data on the Carnegie Community Engagement classification for research purposes.

The Carnegie Classification on Community Engagement began in 2005 and applications are accepted every 10 years. Once approved to receive the classification, the classification remains valid for ten years. When the institution decided to be re-classified institution, they need to apply again. Re-classified institutional are requested to provide evidence how they have committed to community engagement since their last application (Saltmarsh & Johnson, 2018). For the re-classified universities, the latest applications were reviewed. The documents were reviewed in two ways. First, the Carnegie applications were used to identify to see whether the university emphasizes its community engagement in the global context. In the application, the definition of community engagement is stated on the first page and none of the sections specifically asks to indicate global engagement. The Carnegie

does not require a university to include its global engagement. It is solely decided upon by the university whether to include their global engagement or not. Thus, through the review of applications, the indication of a global-related agenda and activities suggest that such engagement is a priority and therefore, in comparison to an institution that does not include global engagement as one of their prioritized examples, these institutions can be considered to have a more globally engaged institutional agenda.

Second, the accumulated data from other resources (i.e., university websites, IPEDS, and other respective websites) were used for the quantitative analysis. These data are summarized in Table 6 and represent a rather comprehensive data set. These data included a wide variety of variables, namely: background contextual variables, control variables, possible explanatory variables (both exogenous and endogenous), key statistics reflecting an institution's global engagement, and other outcome variables such as institutions' academic rankings.

Table 6 illustrates all the variables that were selected for this study. Variables with * sign were the ones included in the study and variables to conduct research question number one and with ** signs were used to answer the second research question.

Table 6. Potential indicators of global engagement

	Indicators	References	Data Sources
I. Student characteristics	1. Number of international students 2. Percentage of international students 3. Number of international students countries of origin* 4. Number of student Fulbright fellows* 5. Number of Peace Corp volunteers*	Horn, Hendel, and Fry (2007)	- IPEDS database - Fulbright website - Peace Corps Database
II. Faculty characteristics	6. Number of international faculty 7. Percentage of international faculty* 8. Number Fulbright scholars*	Horn, Hendel, & Fry (2007)	- IPEDS database - Fulbright website
III. Research	9. Number of Title VI centers* 10. Presence of Title VI centers 11. USAID Funding 12. Grand Challenge	Horn, Hendel, and Fry (2007), Butterfield et al. (2016), Nowell et al, (2020)	- Department of Education - USAID website - Institutional website
IV. Curriculum	13. Number of less commonly taught languages (LCTL)* 14. Number of study abroad programs* 15. Number of study abroad destinations*	Horn, Hendel, & Fry (2007)	- Institutional websites
V. Institutional Support	16. Establishment of public engagement office 17. Establishment of global engagement office 18. Presence of senior administrator for public engagement 19. Presence of senior administrator for global engagement 20. Number of staff in public engagement office 21. Number of staff in international affairs office* 22. Student incentives and rewards 23. Faculty incentives rewards	Furco (2010), Horn, Hendel, & Fry (2007)	-Respective website -Institutional website -Clinton Global Initiative website -UN Sustainable Development Solution Network website

		24. Clinton Global Initiative (CGI) University Network 25. UN Sustainable Development Solution Network 26. Global engagement presence on homepage		
VI.	Philosophy and mission	27. Definition of global engagement* 28. University plan for global engagement*	Furco (2010)	- Respective website - Institutional website
	Institutional characteristics	University National Ranking ** University Global Ranking** Type (Public/ Private)** Land grant** State appropriations** Government funding** Private funding** Enrollment size** Size of endowment**	Furco (2010) Horn, Hendel, & Fry (2007) Fernhaber, S. A., Gilbert, B. A., & McDougall, P. P. (2008)	-Respective site -Institutional website -IPEDS database -Times HE website

Phase two: Quantitative analysis

The data from the various resources were organized in an Excel format and the four types of analyses mentioned previously were conducted using the statistical program SPSS and R. Specifically, to address the research questions, the analyses include presentation of the descriptive profile, item analysis, exploratory factor analysis, and multiple regression analysis (OLS).

Descriptive analysis

The descriptive was necessary to provide a rich profile of U.S research universities' global engagement, including data such as mean and standard deviation for continuous variables and frequencies and percentages for categorical variables.

Item analysis

Psychometric item reduction and multiple variable analysis techniques assessed the six hypothesized categories that constitute global engagement including student characteristics, faculty characteristics, research, curriculum, institutional commitment and mission. Also, psychometric item analysis was used to establish the reliability of items in order to create a potential index of global engagement. Benson and Clark define reliability as "the consistency of the measurement over time or the precision of the measurement," (p.795). Rodenburg et al. (2012) described the importance of conducting such psychometric analyses. First, it is a way to reduce the number of items in an index by eliminating those with poor data quality. The second is to help establish a good measurement model. These scholars assert that developing a robust reliable index will

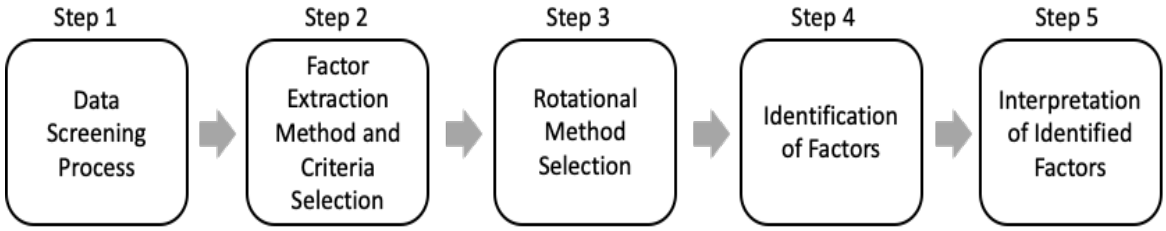
depend on selecting items that are good indicators of factors and ensuring that the factors are well-measured.

To check the reliability of the index, the internal consistency method was employed to obtain the reliability coefficient to assess if items on the scale are contributing consistently to the total score. Items that do not correlate well with the overall construct were eliminated. An item analysis produced a coefficient alpha to assess the psychometric strengths of the index and its construct validity. Those with the highest correlations were used in the next stage, which is exploratory factor analysis.

Factor analysis

An exploratory factor analysis was then conducted for three major purposes: (a) data reduction; (b) to assess and construct (global engagement) validity; and (c) to see if a factor structure of the key components of global engagement emerges and the extent to which that confirms the Furco model. Items with high loadings were included in the analysis to also have perhaps a weighted factor index of global engagement, based on the factor analysis. The factor loadings were used as the dependent variable in the next stage.

Figure 2. EFA protocol



Source: Williams et al.(2010). Exploratory factor analysis: a five-step guide for novices, rerotation item and factor analysis

A major way to determine factor retention is through a Scree test and to examine the size of factor loadings.

Multiple regression analysis

Multiple regression analysis was conducted to examine possible variables that influence an institution's level of global engagement. A final concluding quantitative analysis is aimed to see how global engagement relates to a university's academic ranking, controlling for other variables. Potential key explanatory variables are:

1. Type (Private or Public)
2. Land grant
3. National ranking
4. Global ranking
5. Enrollment
6. Endowment
7. Government funding
8. State appropriations
9. Private funding

University rankings, land-grant, size of the endowment, and source of funding have been suggested as potential influences on universities' prioritization of global engagement (Douglass & Edelstein, 2009; Kellogg Commission, 2001; Mwangi, 2013). For example, ranking is a tool that research universities use as a way to reflect their global reputation, which reflects an interest in having and maintaining a worldwide profile (Giroux 2002; Marginson, 2007; Orphan & O'Meara, 2016). Childress (2010) analyzed Duke

University and the University of Richmond and found larger endowments supported faculty involvement in campus internationalization.

Characteristics of participating institutions

Table 7 provides descriptive statistics for the research institutions that were classified with the Carnegie Classification for Community Engagement in four application rounds taking place between 2008 to 2015. In total, during this period, 114 research universities were classified (excluding re-classified institutions). However, due to the missing data on some of the variables important to this study, only 110 universities are included in this investigation (Appendix 1). The majority of institutions are public universities and non-religious affiliated. In terms of location, institutions were relatively evenly split between coastal and non-coastal regions. One-third of institutions have 10,000-30,000 enrollment and two-thirds are located in larger cities and urban areas.

Summary

The present study uses three frameworks drawn from previous studies to create a foundation for identifying the potential indicators of global engagement. Though there were limitations to gathering a complete set of data, the data are accumulated from various sources and indicators aimed to provide a holistic view of universities' global engagement. Four types of quantitative analysis — descriptive analysis, item analysis, factor analysis, and multiple regression analysis — were conducted to answer the study's two main research questions.

CHAPTER 4

RESULTS

Statistical analyses were conducted to determine which set of items should appropriately be included in a global engagement index based on six possible categories and 25 empirical indicators. Then reliability and validity evidence were conducted to discover key components of global engagement. This chapter presents the results from the descriptive statistics, exploratory factor analysis for assessing construct validity, and the multiple regression conducted to examine factors influencing global engagement. The descriptive results provide background information on U.S. research universities' dimensions and components related to global engagement. The elements include student, faculty, curricula, institutional characteristics, and philosophy and mission of global engagement. The factor analysis provides insight into the structure of the global engagement variables. The multiple regression analysis provides data to address the study's key research questions:

1) Which institutional and human resources characteristics reflect and define US research universities' global engagement?
2) What are the factors that influence US research universities' global engagement?

Treatment of Missing Values

The data were collected from various sources, such as national and global university rankings, and there were several missing data that were publicly unavailable. Some institutions were not on the ranking lists and several of them were at the very end of the ranking range. Dealing with missing data is critical because missing values can cause frequent problems and inaccurate results. There are several ways to deal with missing values and the simplest way is case deletion. However, due to the small sample size of this study, it was important to impute values for missing data. One option for imputing a missing value is using the mean (or median) imputation method. Other more complex options include using parameter estimations such as maximum likelihood and other imputation techniques (Acuna & Rodrigues 2004). Among the several ways to impute missing data, the nearest neighbor imputation method was chosen to fill the missing data for this study. Due to the multidimensional nature of the data, it was challenging to complete this imputation. Therefore, cluster analysis was used to observe variables that are homogeneous and in distinct clusters.

Hierarchical clustering

Initially, in many cases, data sets are not independent of each other, and identifying the possible relationship among variables missing values should be determined (Batista & Monard, 2003). The first step was to impute the missing data by conducting hierarchical clustering in order to see the clusters that are connected. Hierarchical clustering is a method used to determine clusters of similar data points in multidimensional spaces.

A total of 14 complete variables were selected for hierarchical clustering and the Euclidean distance square was selected to measure the distance between the variables. From the dendrogram, all missing data were imputed with the nearest neighbor institution. For example, University of Minnesota and the University of North Carolina at Chapel Hill, University of Notre Dame and University of Pennsylvania, and the University of Vermont and Virginia Commonwealth University came out to be the nearest neighbors after selecting variables such as size of enrollment, endowment, number of international students etc. which nicely indicated face validity. From the result, global and national ranking scores were replaced by looking at the data and characteristics of the nearest neighboring institutions.

The final hierarchical cluster structure is shown by a dendrogram — a tree that shows clusters that were linked at each step. The cluster analysis determines the closest distances to each variable in order to determine the relationships and patterns in the data (Appendix 2).

Descriptive results

Table 7 shows the descriptive statistics of the sample 110 institutions.

Table 7. Information on institutional characteristics (n=110)

	Measurement scale/codes	N	%	*M*	*SD*
Type	Public	81	73.6		
	Private	29	26.4		
Land-grant	Yes	39	35.5		
	No	71	64.5		
Religion Affiliated	Yes	14	87.3		
	No	96	12.7		
Size (Enrollment)	Under 10,000	13	11.8	23113.2	12812.2
	10,000 – 20,000	35	31.8		
	20,001 – 30,000	34	30.9		
	30,001 – 40,000	16	14.5		
	40,001 – 50,000	8	7.3		
	Above 50,001	4	3.6		
Location	Coastal	53	48.2		
	Non-coastal	57	51.8		
Location	City	38	34.5		
	Urban	34	30.9		
	Suburb	22	20		
	Rural	12	10.9		
	Non available	3	2.7		
Carnegie Classified Year	2008	9	8.2		
	2010	32	29.1		
	2015	16	14.5		
	2015(Reclassified)	53	48.2		
National rank	Top 50	18	16.4	137.5	89.8
	51 – 100	23	20.9		
	101 – 200	43	33		
	201– 300	25	23		
	Above 600	1	0.9		
Global rank	Top 100	14	13	442.7	310.5
	101 – 200	14	13		
	201 – 400	34	31		
	401 – 600	16	15		
	601 – 800	12	11		
	Above 800	20	18		

The following analyses are to determine which set of items should appropriately be included in the global engagement measure based on 20 empirical indicators in six categories. Initially, there were 28 indicators but eight were eliminated after factor analysis. Additionally, the reliability and validity evidence of the developed index was employed to measure the key components of global engagement.

Table 8. provides descriptive statistics of the US research universities' indicators used to measure the global engagement index scores. The components include student, faculty, curriculum, institutional characteristics, philosophy and mission of global engagement.

There are several notable points to address. The overall average of international students in sample institutions was higher (9.0%) in 2018 compared to the 5.5% national average in the same year (IIE 2018). This number shows that sample research universities are more likely to attract more international students which reflects the trends of international enrollment, where most of the international students are in doctoral-level institutions.

Over half of the institutions had the presence of senior administration in international affairs and the average number of staff was 24 with a huge range from only three to a maximum of 157. Fitzgerald et al. (2012) note the importance of faculty incentives and rewards systems. Most research institutions had student and faculty incentives to encourage global engagement.

Also, for institutional mission, many institutions had global engagement reference in their on campus-wide mission statement yet, not many had included the definition or mission of community engagement that had global engagement references.

Table 8. Descriptive statistics for each element of global engagement

Categories	Items	*M*	*SD*	Skewedness	Kurtosis	Min	Max
Students	Number of Fulbright students	4.9	6.0	1.89	4.091	0	30
	Number of int'l students	2,536	2535.7	1.82	3.11	15	11,513
	Number of int'l students' countries of origin	93.9	32.0	-0.115	0.10	10	173
	Number of Peace Corps volunteers	21.5	19.4	1.50	2.29	0	95
Faculty	Number of Fulbright scholars	2.3	2.0	0.87	0.42	0	9
	Number of int'l faculty	66.0	98.6	7.42	67.96	0	977
Research	Presence of Title VI centers	0.26				0	1
	Number of Title VI centers	1.1	2.8	3.44	13.56	0	16
	USAID in USD (in thousands)	22,236	73,017	5.70	38.36	0	597,874
Curriculum	Number of study abroad programs	402.5	357.9	1.70	3.33	4	1830
	Number of study abroad destinations	57.4	23.7	0.71	2.03	4	136
	Number of less taught languages	10.0	13.7	2.78	7.54	0	68
Institutional Commitment	Presence of global office	0.99				0	1
	Presence of community office	0.87				0	1
	Presence of senior administrator in int'l affairs	0.63				0	1
	Number of staff in global engagement/int'l affairs	24.3	23.9	3.12	12.67	3	157
	Student incentives & rewards	0.79				0	1
	Faculty incentives & rewards	0.81				0	1
	UN Sustainable Development Solutions Network	0.25	0.44	1.14	-.071	0	1
	Grand Challenge Initiative participation	0.56	0.50	-0.26	-1.97	0	1

	Number of staff in community engagement office	11.56	15.68	5.05	35.48	1	135
	Presence of senior administrator in community engagement	0.56	0.50	-0.26	-1.97	0	1
	Presence of global engagement on main website	0.34	0.48	0.70	-1.54	0	1
Mission	Definition of community engagement with global agenda	0.68				0	1
	University Mission Statement with global agenda	0.73				0	1

As shown in Table 8, other than dichotomous variables, all the indicators are on different scales, and they were converted into standardized values (z-scores) to conduct further analysis (standardized to a mean of zero and a standard deviation of one).

Exploratory Factor Analysis (EFA)

As mentioned previously, an exploratory factor analysis (EFA) was conducted to explore the underlying structure of the key data using the program SPSS and *R*. EFA is to identify a set of unobserved (i.e., latent) factors to reconstruct the complexity of the observed (i.e., manifest) data in the essential form (Matsunaga 2010). Often EFA is conducted when the primary data is collected by a researcher rather than using a secondary database. In addition, EFA is chosen when there is no strong underlying theory and when the number of factors in the data is unclear.

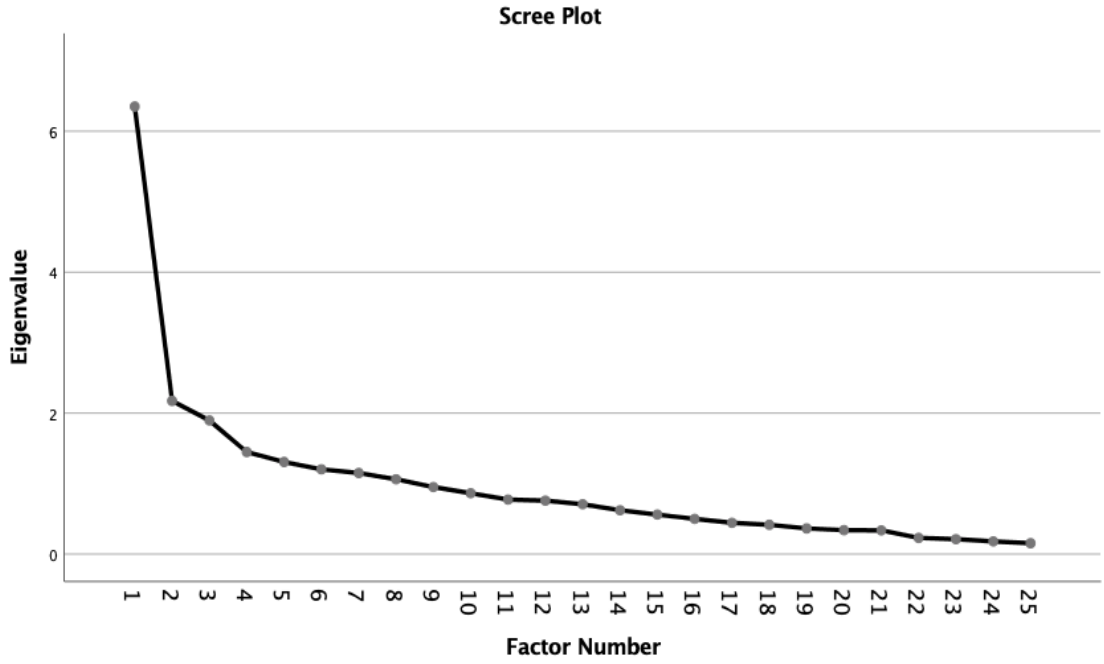
According to Gorsuch (1983), in order to conduct EFA, the sample size must be at least 100. Comrey and Lee (1992) claim that when the sample size is 100 it is poor,

200 is fair, 300 or more is good to excellent. After excluding missing data, the final number of institutions retained was 110 with 17 statistical indicators. The ratio for this EFA was 6:1, which is an acceptable ratio to conduct exploratory factor analysis. In terms of the ratio of sample size, the number of indicators must be at least 10 (Everitt, 1975) while other scholars suggest ratios of 3:1, 4:1, 5:1. (Osborne et al, 2014; Pallant, 2013). An initial analysis was run to ascertain the factor pattern of these data. The Kaiser-Meyer-Olkin Measure verified the sampling adequacy for the analysis.

In this study, six categories — student characteristics, faculty characteristics, research, curriculum, institutional commitment, and philosophy/mission – were anticipated to be factors among the indicators (even though the theory is preliminary) to potentially explain the structural pattern of the preliminary question along with a scree plot and eigenvalues (Thompson, 2004). Kaiser's criterion suggests that number of factors that are above the eigenvalue of one need to be retained (Kaiser, 1960). Principal axis factoring was used because it is recommended when the multivariate normality is severely violated, it is the best option for extracting the data (Fabrigar et al., 1999).

A Scree test was conducted to create a visual graph of the structure of the data used in the factor analysis. The Scree test enabled to determination the breakpoint at which a factor is a major component of the variance in a model (Hayton, 2004; Costello & Osborne, 2005).

Figure 3. Initial Scree plot for the index for global engagement



Next, to clarify the data structure varimax rotation was chosen since the factors are less correlated. Initially, 28 variables were chosen to create an index, but several variables were dropped from the factor analysis, which had low communalities. Those indicators include, for example, being a member of Clinton Global Initiative, the presence of global engagement on university main website, presence of community engagement office, community engagement office with global agenda, Carnegie report with global agenda.

Preliminary ten- factor structure

Initial analysis was conducted with 25 variables to determine which factors need to be extracted and retained. The eigenvalues and the Kaiser-Meyer-Olkin Measure verified the sample for the analysis. The preliminary KMO=.779 which is acceptable

because it is greater than 0.6 as Kaiser recommended. Bartlett's Test of Sphericity, $\chi 2$ (276) = 968.958, $p < .000$, shows that correlations between items were sufficiently large for EFA. In sum, the total ten factors had eigenvalues greater than 1.0 as illustrated in Figure 3.

Table 9. Eigenvalues, total variances explained for a preliminary ten-factor structure

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	6.350	25.402	25.402	5.937	23.749	23.749	3.303
2	2.174	8.695	34.097	1.811	7.243	30.992	2.175
3	1.896	7.585	41.682	1.498	5.992	36.984	1.844
4	1.449	5.795	47.477	1.049	4.194	41.178	1.315
5	1.307	5.228	52.705	0.895	3.579	44.758	1.267
6	1.202	4.809	57.514	0.867	3.467	48.224	1.209
7	1.150	4.600	62.114	0.597	2.386	50.610	1.066
8	1.062	4.248	66.362	0.516	2.064	52.674	0.991

Note: Extraction Method: Principal Axis Factoring.

The initial 25 item structure explained 66.4% of the variance in the pattern of relationships among the items as shown Table 9. The variance explained by factor 1 was 25%; factor 2, 8.7%; factor 3, 7.6%, factor 4, 5.8%; factor 5, 5.2%; factor 6, 5.2%; factor 7, 4.6%; factor 8, 4.2%; respectively.

Table 10. Initial 8 factor structure model

	Factor							
	1	2	3	4	5	6	7	8
Number of title VI centers	0.914							
Number of less taught languages	0.671				0.319			
Presence of title VI center	0.658							
Student Fulbright	0.522	0.434						
UN sustainable network	0.484							
Number of Peace Corps volunteers	0.441	0.390		0.366				
Number of global office staff	0.432	0.416						
Community engagement with global engagement								
Grand challenges Participation		0.721						
USAID in dollars		0.656						
Clinton initiative		0.390						
Number of study abroad countries			0.860					
Number of study abroad programs			0.840					
Number of International faculty				0.928				
Countries int'l students	0.330				0.665			
Number of int'l students	0.463				0.501			
Faculty Fulbright		0.361			0.384			
Student incentives in global activities						0.758		
Faculty incentives in global activities						0.617		
Presence of global office								
Presence of community engagement office								
Community mission with global agenda							0.732	
Global mission with service agenda							0.405	
Presence of senior admin in global engagement		0.338					-0.393	0.392
Presence of senior admin – community engagement								0.763

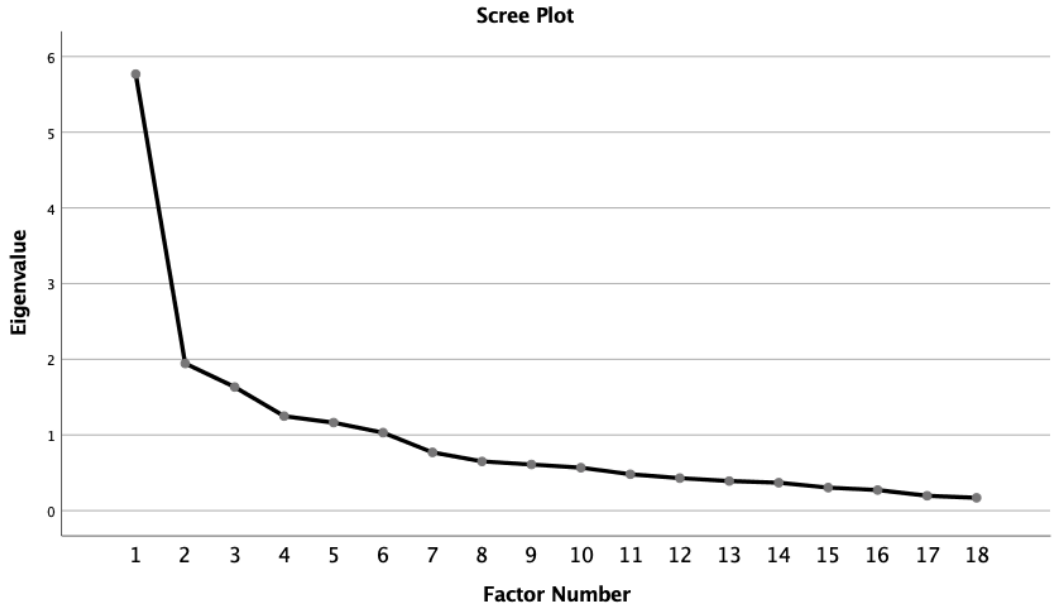
Note: Extraction Methods: Principal Axis Factoring Rotation Method: Varimax with Kaiser Normalization a.Rotation converged in 13 iterations.

The result shows that there were nine items loaded on two or three factors in the eight-factor structure. In total five items were dropped due to low communalities. The communalities show the variance between variables and the main purpose of extraction is to eliminate common variance possible (Child, 2006). Often low communalities (under 0.4) and factor loadings under 0.4 are considered the basis for removal (Bauer & Curran, 2015; Osborne et al, 2014). This process was repeated seven times more, in total dropping seven items including variables (presence of senior administrator in community engagement and global engagement offices, global mission with service agenda, member of Clinton Initiative, Community engagement with global agenda, senior administrator in global engagement, number of community engagement staff).

Final six-factor structure

After deleting all the items with low communalities and low loadings that were less than 0.4, the final matrix was left with 18 items. A Scree test was conducted again to help decide on the final number of factors. The Scree plot leveled off after six factors. Therefore, six factors constituted the final factor model.

Figure 4. Scree plot for the final six-factor structure for the global engagement



The Kaiser-Meyer-Olkin Measure for this structure proved that the sampling is adequate to proceed with the analysis, KMO=.796 which much higher than the threshold of 0.6. Barlett's Test of Sphericity, $\chi 2$ (153) = 801.413, $p < .000$, shows that correlations between items were sufficiently large for EFA.

As shown above, the initial 25 items explained 66.4% of the variance while the final six factors with 18 items explained 71.1%. As shown in Table. 12, the final six-factors, explaining these degrees of variance: 32.0% (culture/language-specific training, research, outreach) for factor 1, 10.8% (strength of study abroad programs), 9.11% (success in attracting international students), 6.9% (applied international research, development work), 6.6% (strength in terms of the presence of international faculty and alumni joining the Peace Corps), 5.7% (incentives supporting global engagement) of the variance respectively. This Scree plot indicates that there is one general global

engagement factor, which provides justification for the development of a single global engagement index. After six factors, the Scree plot levels off, which also provides support for the use of the six-factor structure to provide for a deeper understanding of the structure of global engagement and its key dimensions.

Table 11. Final six-factor structure model

	Factor					
Variables	1	2	3	4	5	6
Factor 1 Culture/language specific training, research, outreach						
Number of Title VI centers	.880					
Presence of a Title VI center	.625		.341			
Number of less commonly taught languages	.609					
Student Fulbright awarded	.557			.313		
Member of UN Sustainable Development Network	.486					
Number of global office staff	.427			.399		
Factor 2 Strength of study abroad programs						
Number of study abroad programs		.890				
Number of study abroad destinations		.831				
Factor 3 Success in attracting international students						
Number of international students' countries of origin			.630			
Number of international students	.369		.629	.306		
Presence of senior administrator in community engagement			.448			
Faculty Fulbright awards			.446	.366		
Factor 4 Applied international research, development work						
Grand challenges participation				.813		
USAID grant	.315			.519		
Factor 5 Strength in terms of presence of int'l faculty and Peace Corps volunteers						
Number of international faculty					.831	
Number of Peace Corp volunteers				.315	.471	
Factor 6 Incentives supporting global engagement						
Faculty incentives in global activities						.714
Student incentives in global activities						.611

Extraction Method: Principal Axis Factoring. Rotation Method: Varimax with Kaiser Normalization. a. Rotation converged in 6 iterations.

Exploratory factor analysis has been criticized for its arbitrary subjectivity despite the methodological decision criteria. At most times, EFA requires the researcher's judgment to make decisions depending on the conditions (Tabachnic & Fidell, 1996; Kieffer, 1999) and need to make a subjective decision considering issues around the number of loadings and cross-loadings. According to Costello & Osborne (2005), cross-loading is an item that is higher than .32 on two or more factors. In the case of the research design, complex variables such as cross-loadings can be retained with the assumption of the latent nature of the variable. It can also be dropped when it is challenging to make clear interpretations (Yong & Pearce, 2013).

As shown in the final factor model, there are several cross-loadings, however, the variables were retained because the variables were meaningful for this study. Scholars suggest retaining at least three items to represent each factor (MacCallum, Widaman, Zhang& Hong, 1999; Raubenheimer, 2004). However, at a time two items can represent one factor, and that is acceptable if there are valid theoretical and practical reasons (Gosling et al., 2003).

It is important to decide which factor to retain, yet there is no consensus on concrete criteria for retaining factors. After many iterations of running factor analysis and based on the previous literature,18 items were retained to identify meaningful factors to help discover the key dimensions comprising US research universities' global engagement.

Item Analysis for Reliability

An item analysis was conducted to test the estimate the reliability of the global engagement index. Blunch (2008) notes the acceptable internal consistency ranges from .6 or higher. The overall coefficient alpha of the index was .69 which indicates an acceptable reliability coefficient.

Development of the Global Engagement Index

Based on the final six-factor analysis, a global engagement index was created. There are several methods to create a composite score (Hair et. al, 2010). Among such methods are: 1) to take the standardized mean of all items comprising each factor; 2) to sum the scores by factors; or 3) to use a dominant item in the factor, for example, by selecting the item which has the highest loading. One of the easiest methods is to compute a score is by summing the raw scores corresponding to all items loaded on a factor (Comrey & Lee, 1992). Scholars suggest the sum score method when the scales are used to "collect the original data untested and exploratory, with little or no evidence of reliability or validity" (Hair et al, 2006 p.140). Further, the variance in the original data is maintained by a summarized factor score (DiStefano et, al. 2009).

Unweighted Sum Score

First, the final six factor scores of standardized raw scores were simply summed up to create a final index of global engagement. This is the simplest way to compute a factor score corresponding to how all items load on a factor (Comrey & Lee, 1992). Scholars

recommend using the sum score method when the original data are "untested and exploratory, with little or no evidence of reliability or validity" (Hair et al, 2006, p.14).

Based on the summed factor scores, the top 20 universities in global engagement are listed below. A higher score indicates greater contribution, participation, and commitment toward global engagement.

Table 12. Unweighted top 20 universities ranked by the global engagement index

	Top 20 institution	Index of Global Engagement
1	Indiana University Bloomington	22.32
2	University of Minnesota, Twin Cities	21.58
3	University of California, Los Angeles	21.47
4	University of Michigan	20.66
5	University of Wisconsin-Madison	19.25
6	Pennsylvania State University	18.79
7	Michigan State University	17.76
8	Ohio State University	16.75
9	Cornell University	16.61
10	University of Southern California	16.38
11	University of North Carolina at Chapel Hill	16.30
12	Arizona State University	15.70
13	University of Pennsylvania	15.67
14	Georgetown University	14.66
15	University of Illinois at Urbana-Champaign	12.66
16	University of Georgia	12.00
17	Purdue University	10.50
18	University of Utah	9.70
19	University of California, Davis	9.67
20	Colorado State University	9.36

The top five universities in global engagement were the Indiana University Bloomington followed by the University of Minnesota – Twin Cities, the University of California, Los Angeles, the University of Michigan, and the University of Wisconsin-Madison. These rankings appear to have excellent face validity in that they show that large public research universities that are already well-known for their global

engagement have a high engagement index as expected (Smuckler, 2003; Wharton, 2015). The correlation of the indexes from the unweighted and weighted models is a high .95.

Among the top 20 institutions, only three institutions are private, and the rest are public or land grant institutions and 19 institutions are Carnegie categorized as the highest research institutions. Also, 10 institutions are land-grant institutions.

Regression weighted scores

There are several alternative ways to compute factor scores. The most common refined way to compute weighted factor scores is regression weighted sum scores. The score of the regression factor predicts each individuals' position on the factor or variable (DiStefano et al., 2009). This method is often used because multiple regression techniques are well known. Measured variables are converted into z-scores then, multiplied by standardized score matrix and the inverse of the matrix of variable correlation (Odum, 2011).

Table 13. Weighted top 20 universities ranked by the global engagement index

Top 20 institution		Index of Global Engagement
1	University of Michigan	7.38
2	University of Southern California	4.71
3	University of Minnesota, Twin Cities	4.67
4	University of California, Los Angeles	4.43
5	Pennsylvania State University	4.37
6	Ohio State University	3.92
7	Michigan State University	3.78
8	Arizona State University	3.78
9	Purdue University	3.42
10	Cornell University	3.36
11	University of North Carolina at Chapel Hill	2.98
12	Georgetown University	2.95
13	Colorado State University	2.88
14	Indiana University Bloomington	2.83
15	University of Pennsylvania	2.72
16	University of Illinois at Urbana-Champaign	2.62
17	University of Wisconsin-Madison	2.60
18	University of California, Davis	2.31
19	University of Utah	2.14
20	University of Massachusetts Amherst	2.09

To see whether the weighted and weighted global engagement index has differences, the factor correlation between non-weighted and weighted regression factor scores was calculated.

As the sensitivity analysis shows, the difference between the two methods is minimal and the order of institutions did not change much. As proof, the factor scores of the two methods showed high correlations, ranging from .87 to .98. Unweighted and weighted factors were highly correlated, r =.95. $p < 0.001$.

In this case, as many scholars have suggested, the non-weighted approach was chosen as it is more appropriate for an exploratory study.

Multiple Regression Results

To answer the second research question — What are the factors that influence US research universities' global engagement? — a multiple regression analysis was conducted to examine the factors influencing universities' global engagement.

Dependent variable

The final sum score of the six non-weighted factors was used as the dependent variable as a global engagement index. The index of global engagement variables includes a commitment to area studies (culture-specific learning), engagement with overseas development, success in attracting international students, active in promoting study abroad, success in attracting international scholars and incentives supporting internationalization were summed as a final global engagement index.

Independent explanatory variables

The independent variables in the regression model include institutional elements (type of institution, land-grant), financial elements (state appropriations, government funding, private funding, enrollment, endowment) and ranking factors (national and global rankings). The independent variables were selected based on literature and conceptual and theoretical importance for examining the impact of factors related to the final global engagement index. Preliminary analyses were performed to ensure there was no violation of key assumptions related to normality and linearity. Data were also checked carefully to ensure that there were no multicollinearity problems.

The results of multiple regression analyses using the global engagement index as the dependent variables are shown in Table 17.

Table 14. Multiple regression results

						Collinearity Statistics	
Variables	b	SE	β		r	Tolerance	VIF
(Constant)	6.158	2.801					
Type (private=1)	-4.999	2.290	-0.230	*	-151	.270	3.705
Land-grant(land-grant =1)	1.094	1.226	0.055		.195	.799	1.252
Endowment	3.160	0.801	0.328	***	.687	.432	2.312
Enrollment	2.810	0.688	0.292	***	.571	.585	1.709
Government funding	0.070	0.088	0.056		.231	.612	1.634
State appropriations	-0.070	0.064	-0.098		-.128	.381	2.626
Private funding	0.100	0.131	0.054		.437	.597	1.675
National rank	-0.030	0.008	-0.278	***	-.509	.536	1.867
Global rank	-0.004	0.002	-0.141	**	-.524	.668	1.497
F (9,100) = 26.112 p<.000; sample size = 110 R^2=.70; Adjusted R^2=.68							

Note: * p < .05, ** p <.01, *** p <.001
r= bivariate correlation

The nine variables together explain 68% of the variance (R-squared) in the index of global engagement. A highly significant regression model was confirmed (F [9, 100] = 26.112, p<.000).

As can be seen in table 17, type of institution (public =0, private = 1), state appropriations, national rank, and global rank are negatively correlated with global engagement score. This means that public institutions and nationally and globally higher-ranked universities are more associated with the global engagement index. Size of enrollment and size of endowment had significant positive regression weights, indicating institutions greater in size of these variables are expected to be more globally engaged, after controlling for the other variables in the model. The variables of land-grant universities, state appropriations, government funding, and private funding did not contribute to the multiple regression model.

In addition, though the global ranking showed a statistical association with the global engagement score, it is weakly associated, whereas the national ranking is more strongly associated. This suggests that the current global ranking systems do not necessarily reflect how the universities are contributing to the global society, but rather are more concerned with assessing research performance. Meanwhile, universities funding from the government, state nor private were not found to be significant. Finally, public universities were found to be more committed to global engagement compared to private universities.

Summary

A major goal of this research was to create for the first time ever an index to assess the global engagement of US research universities. An initial pool of 25 possible empirical indicators was created, based on a review of related literature and my own understanding of the process of the internationalization of higher education. An exploratory factor analysis (EFA) and item analysis were used to accomplish this goal. A major goal of EFA is data reduction. In that regard, the final data set was comprised of 18 indicators. EFA also helped to discover the structure of the elements comprising global engagement. Six factors emerged, namely: 1) culture/language-specific training, research, outreach; 2) strength of study abroad programs; 3) success in attracting international students; 4) applied international research, development work; 5) strength in terms of the presence of international faculty and alumni joining the Peace Corps; and 6) incentives supporting global engagement.

Thus, the final index is comprised of 18 indicators and six factors/dimensions. The coefficient α for the index is .69 indicating sound reliability. The index was created using factor scores. Sensitivity analysis was done comparing unweighted and weighted scores. As expected, the two approaches yielded extremely similar results. Thus, the unweighted index was used since this was exploratory research ((Hair et al, 2006, p.14). The top 20 research universities in terms of global engagement were identified in rank order. Then a regression model was created to ascertain the factors most influencing global engagement. The model developed had nine variables with good explanatory power, explaining about 67.5% of the variance in global engagement. The variables with the most explanatory power were the size of the institution (supporting Simon's theory of economies of scale) and endowment size. Another important finding was that national and global rankings were negatively associated with global engagement, which means the lower number for ranking are higher ranked schools suggesting that both ranking systems do to some extent reflect global engagement, but the size effects are quite modest. especially for global rankings. Going forward, in-depth qualitative research is needed to develop a more nuanced deeper understanding of other important factors that may influence global engagement.

CHAPTER 5

DISCUSSION AND CONCLUSION

Discussion

Based on the quantitative findings, this study utilizes variables, dimensions, and items that are significantly meaningful to measure institutions' global engagement. The results are also used to identify important factors that influence institutions' global engagement. Two key research questions guide this study

1. Which institutional and human resources characteristics reflect and define US research universities' global engagement?
2. What are the factors that influence U.S. research universities' global engagement?

For the first question, initially, 28 items are selected and categorized by six dimensions; student: five items, faculty three items, curriculum three items, research four items, institutional mission two items, and institutional support, 11 items. Next, exploratory factor analysis was conducted, and 20 items remained in the final model and as a result, a final aggregate index of global engagement was created.

Next, multiple regression was conducted to examine possible variables influencing the level of global engagement. As a dependent variable, an unweighted factor index was created and the influence of nine key independent variables was analyzed to answer the second research question. By using the index of global engagement, the top 20 universities were identified and ranked. Large and well-funded public universities and universities with large endowments have scored high compared

to smaller less well-funded research universities. The resulting rankings have excellent face validity.

Research question 1

1) Which institutional and human resources characteristics reflect and define US research universities' global engagement?

Figure 5. Final structure illustrated in fish diagram

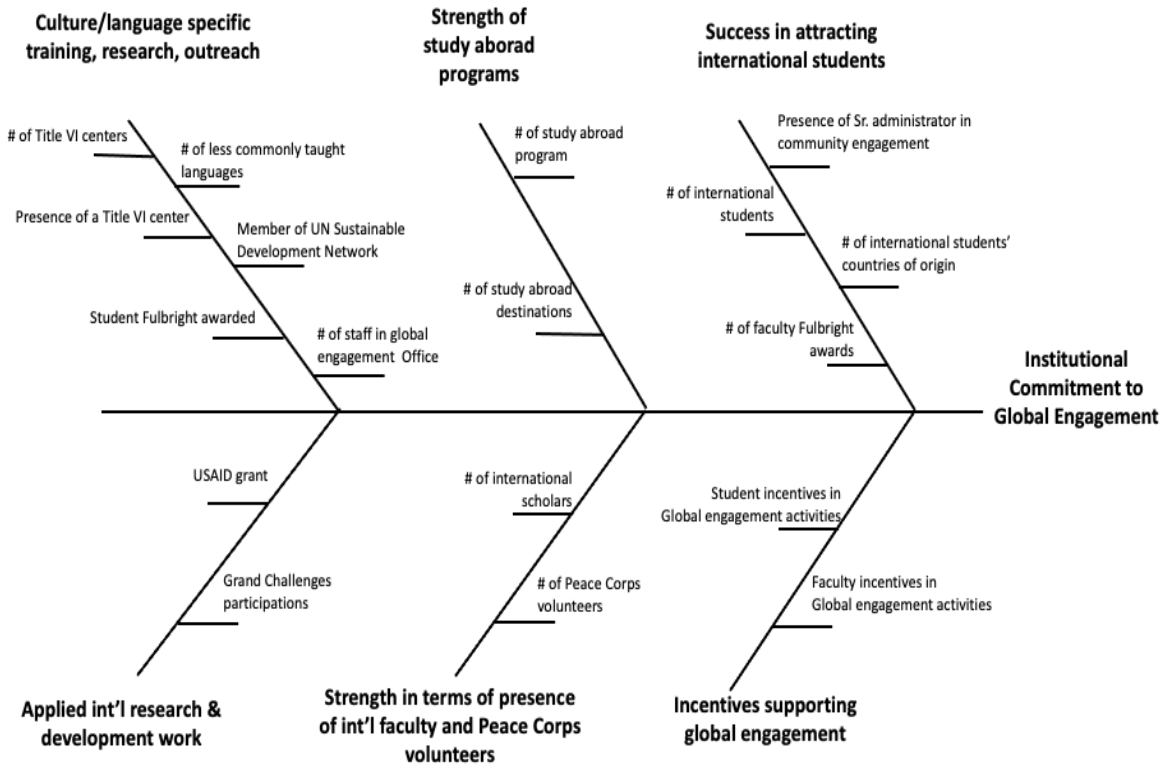


Figure 5, illustrates the overall structure of institutional commitment to global engagement based on exploratory factor analysis. Derived from a critical review of the literature, the initial hypothesized model consisted of six major dimensions (1) student

characteristics (2) faculty characteristics (3) research (4) curricula (5) institutional commitment, and (6) mission. However, based on the empirical analysis of this study, the advancement and institutionalization of global engagement in higher education is found to have six major dimensions: (1) commitment to area studies, (2) engagement with overseas development, (3) success in attracting international students, (4) active in promoting study abroad, (5) success in attracting international scholars and (6) incentives supporting internationalization. Twenty-two empirical indicators associated with the six dimensions provide the research basis for a more refined and nuanced model of the structure of global engagement.

There are several important points to address in understanding this structure. First, it does not indicate and weigh the importance of each element. Since this is exploratory research, it only aimed to identify items that are statistically associated with other global engagement items. As shown in Figure 5, most of the categories were comprised of similar elements that were statistically crystalized.

Second, the final model shows that success in attracting international students and international scholars and the number of study abroad programs remain to be an integral dimension of global engagement. With regard to international students, the number of international students' countries of origin emerged as a meaningful item as well.

This shows that it is not only quantity, but that diversity matters. This result reflects well that exposure to multiculturism on and off campus can significantly strengthen meaningful engagement with the global community.

Third, in some cases, items categorized in the initial model have been transformed to belong to a different group with a new dimension. For example, commitment to area studies consists of six items including both institutional and human resource elements. Also, some of the items showed an intersection between dimensions and more investigation is required for some items grouped together. This suggests that global engagement is not a simple linear process, nor can it be easily defined nor operationalized

Fourth, often global engagement is defined in an overly simplistic superficial linear way by emphasizing the number of international students and scholars and counting the number of branch campuses or study abroad programs. However, the results of this study show that a comprehensive definition of global engagement is far more complex. It expands beyond the traditional scope of internationalization and service and outreach components. This indicates that the concept of internationalization and public engagement are closely associated, intertwined, and it is important to consider the overlapping mission and strategies. This in fact will create greater synergy for both areas in internationalizing the campus and fulfilling the commitment to global engagement.

Research question 2

2) What are the factors that influence US research universities' global engagement?

To answer the second question, multiple regression was conducted. The result shows that endowment, enrollment, the number of international students, and state appropriations

were the four variables that showed the strongest explanatory power. This means that the larger institutions with greater resources in funding are more globally engaged. This supported the resource dependency theory which shows the institutions with greater resources tend to allocate more resources to support the global engagement agenda. This finding also supports Simon's economies of scale theory (Simon, 1962).

In addition, the global ranking does not show a statistical association with the global engagement score whereas the national ranking is modestly associated. This suggests that the current global ranking systems do not necessarily reflect universities' global engagement. Meanwhile, universities that rely less on state appropriations and public universities have higher global engagement scores. This anomaly can be explained by the greatly reduced funding going to many prominent state universities, providing a strong incentive for them to seek external funding in support of global engagement.

Finally, public universities were more committed to global engagement compared to private universities. However, the establishment of public universities with the mission to serve the community, such as land grant universities, might have cultivated the overall culture of the institution to make contributions to the global community as well. Also, private universities may be more focused on the kind of research that enhances rankings so important in competition among universities to attract the best students and faculty.

Implications for Policy and Practice

While internationalization and global engagement of higher education have been important areas for decades, connecting the two areas has been rarely examined or studied. However, due to the recent pandemic, the whole world is disrupted, and higher education has been adversely affected severely as well. The impact on student and faculty mobility, campus internationalization, research collaborations, and other partnerships have been tremendously disrupted. Thus, as Marginson (2020) notes, the pandemic showed a greater need for higher education to contribute to the global common good, and global collaboration is needed more than ever before to solve issues such as the global pandemic. The new model for internationalization and global engagement is required currently and revision of university goals and strategies are necessary to prepare for a future with rapidly changing often disruptive unpredictable new technologies.

This study provides several implications for practice and policy that can be applied to research universities and other types of higher education institutions as well.

First, this study provides the opportunity to define a new kind of engagement that opens the opportunity for administrators and staff to rethink their overall agendas around internationalization and public engagement. Many institutions are decentralized, and the two areas are operated separately which leads to limitations and barriers to create coherent/collective goals across the campus. While in reality they share many common concerns related to areas in which creative collaboration is certainly possible.

Second, the index of global engagement provides a tool to measure global engagement from a broader more nuanced perspective. In the traditional ranking system, which many higher institutions use to measure their overall quality of education that is heavily concentrated in research and not so much on teaching and service. Many criticize the methodologically flawed and unreliable ranking systems. Nevertheless, governments and institutions have been highly relying on it because they are globally influential. This phenomenon aggravates the competitive nature of universities and influences the lower tier universities aiming to improve their status in the rankings league, as if research is the most important and only criterion. Governments and institutions should realize the vicious circle of the ranking system and consider measuring multi-dimensional ways to capture a more holistic quality of education that includes global engagement as an important dimension.

Therefore, though it is exploratory at this stage, this index provides a practical tool to enhance institutions' capabilities to assess the extent of their global engagement. Moreover, this can be used in a way to review institutions' fulfillment of their commitment to internationalization and contributing to the global public good. Later, this can be used for institutional planning and develop coherent missions and strategies and prepare faculty and students to develop global and intercultural competencies and become genuine global citizens. Furthermore, it allows improving the current national and international ranking system to incorporate global engagement that measures holistically research or other important activities that contribute to the UN's Sustainable Development Goals (SDGs).

Third, this study is particularly meaningful since it is the first time to examine research universities classified as the Carnegie Classification for Community Engagement and see to what extent they include global components in their agenda. This allows administrators to consider their scope of community engagement and further explore their engagement with the global society and align with an institutional mission for those who have a greater commitment toward global engagement. This can start simply by reviewing their main homepages and see whether their mission and goals are explicitly reflected. Through this study, it was found that not all universities which claimed to be globally engaged had anything on their homepage, whereas in contrast, athletics was almost always present as a prominent activity.

Fourth, this study shows that more institutional intervention is required. For example, the results show that having a greater number of international students and scholars on campus reflects global engagement. This provides a rationale for universities to continue to attract actively international students not solely for economic purposes but to also cultivate a culturally diverse environment on campus that helps campuses to be more globally engaged. In addition, offering incentives and rewards to faculty, staff, and students regarding global engagement activities is a meaningful way to motivate and increase their involvement in global engagement activities. For example, for faculty, merit pays for global engagement success, perhaps extra time on the tenure clock to encourage longer-term overseas assignments, and course releases to develop global engagement grants would be helpful. Global engagement activities can be extremely time-consuming.

Lastly, there is a need for consistency with institutional mission and strategy which can also be reflected across the campus, starting from enhancing main homepages reflecting global engagement. There were several institutions claiming to be highly engaged universities, yet their signs of global engagement weren't present in their main homepages where 'athletics' was always present.

Conceptual Implications

The institutionalization of global engagement at research universities is challenging as institutions have different priorities and competing strategies at the same time. Nonetheless, as illustrated above, the emergence of a new frame of global engagement requires a comprehensive and holistic approach so that it serves institutions' tripartite mission in teaching, research, and public engagement.

Bringle and Hatcher (2000), Holland (2000), and Gray et al. (1998) emphasized that to make a publicly engaged institution, the presence of centralized office and senior leadership is crucial. In addition to this point, other scholars (Bell et al., 2000, Furco, 2001; Letven et al., 2001) asserted that comprehensive support in policies, research, and teaching is critical in creating a community-engaged environment on campus. Similarly, creating a globally engaged campus requires institutions' holistic approach so that they aren't siloed in any way but construct a globally engaged mindset that can be transmitted across the campus and be institutionalized. In accordance with, this study also can contribute to the concept of comprehensive internationalization that was illustrated by

many scholars and organizations (Hudzik, 2015; Childress, 2009; Dewey, 2009; Knight, 1999; ACE, 2021).

According to Hudzik (2015), comprehensive internationalization is "the commitment and action to infuse internationalization, global and comparative content and perspective throughout the teaching, research and service missions of higher education". He also added that comprehensive international impacts institutions' internal and external entities, partnerships, and relationships. American Council on Education (ACE) (2021) recently introduced its revised definition of comprehensive internationalization. ACE explains comprehensive internationalization as "a strategic, coordinated framework that integrates policies, programs, initiatives, and individuals to make institutions more globally oriented and internationally connected".

ACE's comprehensive internationalization also emphasizes on institutions commitment to teaching-research-service mission that is at the core and focuses on leadership and structure, curriculum and co-curriculum, faculty staff support, mobility, partnership, institutional commitment, and policy with the outer lens wrapping around diversity, equity and inclusion, agility and transformation, and data-informed decision-making.

The above two conceptual frameworks are closely related and intersect in this study as they both illustrate the tripartite mission of the institution and recognizes the importance of a holistic approach in regard to institutionalizing their frameworks.

Limitations

This study is the first attempt to analyze research university's global engagement. There needs to be much further research and rethinking to come up with an ideal index that can be ultimately utilized. The following section elaborates on several limitations to this study.

First, the primary source of the Carnegie applications does not require universities to specify their global engagement agenda. Therefore, it was difficult to capture fully universities' agendas on global engagement. Also, the application was submitted at a different point in time which means that some of the applications do not include the most current information.

Next, exploratory factor analysis (EFA) is a useful statistical method to examine the construct validity and psychometric properties of an instrument or scale. Yet, EFA has limitations to test the theoretical foundation of the scale. Therefore, for further study, a Confirmatory Factor Analysis (CFA) should be conducted.

Third, one of the major limitations of this study was the limited access to the data explaining the global engagement because many of the data were unofficial. Thus, finding the data such as the number of community-based research (CBR) or international service-learning classes, overall research budget on global issues, international faculties' countries of origin, international partnerships, other related grants, and budget allocated for promoting for the Sustainable Development Goals (SDGs) would illustrate a more complete picture of overall global engagement.

Fourth, the index can only be used as a self-assessment tool and further research is required to strengthen its validity to justify broader use nationally and globally.

Fifth, to capture the breadth and depth of global engagement, the explanatory sequential design of a mixed-methods study will enrich the study even more. Adding a qualitative phase will accumulate greater insight and understandings to cover both a factual and a meaning level (Kvale, 1996, Gay et al., 2009) and to discover the story behind the numbers. Based on the quantitative phase, selecting an interesting model of the institution to do a rigorous case study will be meaningful (Yin,2014).

Senior administrators and related staff can participate in the interview by asking institutions' interpretations on global engagement, the status of their work, and motivations and challenges. Factors that facilitate or hinder their work will be interesting to explore.

Implications for Future Research

The focus of this study was to open a space to academic and public space to discuss that the scope of global engagement is deeper, complex, and broader than current ones. Furthermore, it addresses different methods and types of engagement that exist.

The present study sought to develop an empirical approach to measure the global engagement of research universities in the U.S. The preliminary result shows that public institutions, those with higher enrollments and larger endowments, higher in the national and global ranking showed a significant relationship with the global engagement index.

The new rank order of universities with global engagement provides an opportunity to question and rethink traditional ranking systems.

In addition, as mentioned earlier, in-depth research can be done by conducting a Confirmatory Factor Analysis (CFA) to examine the predictive validity of the index of global engagement. This will also be able to verify the factor structure of variables and the underlying factor that would better explain and measure institutions' global engagement.

For future research, it would be meaningful to examine the global engagement of different types of institutions such as Historically Black Colleges and Universities (HBCUs), Hispanic-Serving Institutions (HSIs), and community colleges or by location. As an example of the latter, there was an organization, the Northwest International Education Association, established in 1979, to promote the global engagement of community colleges in the Pacific Northwest (also see Johnson, 2011). Finally, it would be valuable to examine how the leadership types and characteristics influence a university's global engagement (Wharton, 2015; Wilson, 2019).

Conclusion

US research universities' commitment to serving the larger community has evolved over time. However, the scope and the strategies they have used have often been highly selective and narrow. The wave of globalization and the related marketization and massification of higher education have created new competing priorities that may hinder institutions from fulfilling their responsibilities to serve the greater community and the

common good. Related to this complex context, this study provides insights for institutions to question their mission fundamentally and evaluate their global engagement policies and strategies. Furthermore, although this is an exploratory study, it provides meaningful and valuable results by examining 110 research-intensive universities that have been nationally recognized in the Carnegie Classification for Community Engagement. These institutions were found to vary significantly in the extent to which they are globally engaged. The conclusion based on the research findings identify six factors and 18 statistical indicators that reflect the extent to which research universities are globally engaged. To conclude, this dissertation has made six major contributions: 1) to develop a reliable and valid index of the global engagement of research universities, 2) to use this index then to rank major US research universities, 3) to identify the overall underlying structure of the dimensions of global engagement, 4) to discover key factors influencing global engagement, and 6) to establish that current ranking systems inadequately reflect global engagement. These contributions and related insights can inform the development of strategies in the future to enable research universities to become more globally engaged in working for the common good.

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Appendix 1: List of 110 Research Universities

No	University	No	University
1	Adelphi University	56	Tufts University
2	Arizona State University	57	Tulane University
3	Auburn University	58	University of Akron
4	Bowling Green State University	59	University of Alabama
5	Clark University	60	University of Alabama at Birmingham
6	Clemson University	61	University of Arkansas at Little Rock
7	Cleveland State University	62	University of California, Davis
8	College of William and Mary	63	University of California, Los Angeles
9	Colorado State University	64	University of Central Florida
10	Cornell University	65	University of Connecticut
11	DePaul University	66	University of Dayton
12	Drexel University	67	University of Denver
13	Duke University	68	University of Georgia
14	Duquesne University	69	University of Houston
15	East Carolina University	70	University of Idaho
16	Emory University	71	University of Illinois at Urbana-Champaign
17	Florida International University	72	University of Iowa
18	Florida State University	73	University of Kentucky
19	Georgetown University	74	University of La Verne
20	Indiana State University	75	University of Louisville
21	Indiana University Bloomington	76	University of Maine
22	Indiana University-Purdue University Indianapolis	77	University of Massachusetts Amherst
23	Iowa State University	78	University of Massachusetts Boston
24	Kansas State University	79	University of Massachusetts Lowell
25	Louisiana State University	80	University of Memphis
26	Loyola University Chicago	81	University of Miami
27	Marquette University	82	University of Michigan
28	Miami University, Oxford	83	University of Minnesota, Twin Cities
29	Michigan State University	84	University of Missouri-Columbia
30	Middle Tennessee State University	85	University of Missouri-St. Louis
31	Mississippi State University	86	University of Montana
32	Montana State University	87	University of New Hampshire
33	National Louis University	88	University of North Carolina at Chapel Hill
34	North Carolina Agricultural and Technical State University	89	University of North Carolina at Greensboro
35	North Carolina State University	90	University of Notre Dame
36	Northern Illinois University	91	University of Pennsylvania
37	Nova Southeastern University	92	University of San Diego
38	Ohio State University	93	University of South Carolina
39	Oklahoma State University	94	University of South Carolina-Columbia

40	Oregon State University	95	University of Southern California
41	Pace University	96	University of St. Thomas
42	Pennsylvania State University	97	University of Texas at Arlington
43	Portland State University	98	University of Texas at El Paso
44	Purdue University	99	University of Texas at San Antonio
45	Rice University	100	University of Utah
46	Saint Louis University	101	University of Vermont
47	Sam Houston State University	102	University of West Florida
48	San Diego State University	103	University of Wisconsin-Madison
49	Southern Illinois University	104	Virginia Commonwealth University
50	St. John's University	105	Virginia Polytechnic Institute and State University
51	Stony Brook University	106	Wake Forest University
52	SUNY College of Environmental Science and Forestry	107	Washington State University
53	Temple University	108	Wayne State University
54	Tennessee State University	109	West Virginia University
55	Texas Tech University	110	Western Michigan University

Appendix 2: Dendrogram

Appendix 3: Codes for 110 Research Universities

Variable Name	Description	Resources
National Ranking		US News Ranking
Global Ranking		US News Ranking
Public/private	0=Public 1=Private	IPEDS
Enrollment	Size of enrollment	IPEDS
Endowment	In millions	IPEDS
Community engagement with global agenda	0= Mission does NOT include global component 1=Mission DOES include global component	University website
Number of international students	Number of International students	IPEDS
Number of international students' countries origin	Number on international students' countries of origin	University website
Number of study abroad Program		University website
Number of study abroad destinations		University website
Number of Fulbright students		Fulbright website
Number of Fulbright scholars		Fulbright website
Number of Peace Corp students		PeaceCorps website
Clinton Global Initiative	0=no 1=yes	Clinton Global Initiative website
Number of international scholars		IPEDS
Community engagement office	0=No 1=Yes	University website
Community engagement office with global agenda	0=No 1=Yes	University website
Presence of senior administrator in community engagement	0=No 1=Yes	University website
Number of community engagement office staff	Number	University website
Presence of global engagement office	0=No 1=Yes	University website
Presence of senior administrator in global engagement	0=No 1=Yes	University website
Number of global engagement office staff	Number of Staff	University website
Student support in global engagement	0=No 1=Yes	Carnegie Report/University website

Faculty support in global engagement	0=No 1=Yes	Carnegie Report/University website
Presence of Title VI center	0=No 1=Yes	University website
Number of Title VI centers	Number of Centers	University website
Number of less commonly taught language		University website
Percentage of Gov't grants & Contracts		IPEDS
Percentage of State Appropriations (IPEDS)		IPEDS
Percentage of private gifts, grants, and contracts		IPEDS
USAID grant in dollars	In millions	USAID database