Developing and Assessing the Attainment of Graduate Attributes and Generic Skills Perceived by Undergraduate Students in the Asia-Pacific: A Case Study on the Value Added for Completing a Bachelor's Degree at the University of Auckland, New Zealand

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Significance of the Study

Society expects that degree granting institutions will ensure college students develop discipline-specific competence as well as generic skills (e.g., communication, written, oral, tolerance, compassion, etc.) and dispositions (e.g., attitudes, beliefs, curiosity, etc.) at the completion a four-year bachelor's degree. However, limited research has yet to examine and review how students actually achieve those desired outcomes. Current research suggests that undergraduate education is not just about discipline knowledge or cognitive skills; instead, dispositions skills that enable graduates to be effective citizens are also valued outcomes for students completing a bachelor's degree.

The primary purpose of this research is to develop a general understanding of how an aspiring world-class public research university in the Asia-Pacific intends to measure graduate attributes, identify appropriate assessments, and obtain data to evaluate institutional effectiveness regarding student outcomes. This proposed three-year longitudinal research project seeks to address three primary areas: 1) establish a detailed understanding of and consensus around the generic skill and attitude outcomes that the University of Auckland has for a bachelor degree; 2) identify and/or develop appropriate measures for the value-added outcomes of completing undergraduate education at the institution; and 3) create a set of procedures by which other departments and institutions in New Zealand can develop measures of student outcomes.

Review of the Literature

To have a clearer picture, this critical review of the literature examines the "value-added" of completing a four-year bachelor's degree relative to intended student outcomes. There is an intensifying interest in the quality of student experiences in higher education and a growing demand for evidence that a university degree provides additional value for students' aside from economic or employment advantages. The purpose of this literature review is to investigate what

added value bachelor's degrees do have for undergraduate students. More specifically, the critical review provides a detailed outline of the intended generic attributes and dispositional outcomes higher education providers will give students' at the completion of a university degree. Additionally, the literature attempts to examine the different types of assessments used to measure student learning outcomes in higher education and to determine whether there is considerable divergence of viewpoint on accountability issues across the higher education sector. For the purpose of this study, the literature review will not examine the employment or economic advantages of completing bachelor's degrees. Additionally, this review will not examine the evaluation or the quality assurance of the university itself.

This review of the literature is broken down into two major themes: the purpose and value of completing a bachelor's degree, and the assessment and accountability in higher education. The review examines three specific categories: 1) Research Assessing the Purpose and Value of Higher Education, 2) Research Assessing Student Learning Outcomes and the "Value-Added" of a Bachelor's Degree and 3) Research Assessing the Social, Cultural, and Environmental Factors that Contribute to Graduate Attributes and Skills in Higher Education.

Research Assessing the Purpose and Value of Higher Education

Context

In recent years, research assessing the purpose and value of higher education has been growing phenomenally. Numerous past studies have suggested that the purpose of higher education has been a contested issue (Middlehurst, 1992; Barnett, 1992a, Barnett, 1992b; Beard, 1999; Harvey & Green, 1993; Coady, 2000; Gale, 2000; Heath, 2000; McInnes, 2000). More recent study, however, claims that the purpose of higher education is now a complex and vexed question. Recent educators, such as, Richard Arum, Andrew Hacker, and Andrew Delbanco have

all questioned the purpose and value of a bachelor's degree as a result to considerable divergence of viewpoints on student learning outcomes in higher education.

Generally, higher education systems are driven by many political and social agendas. Most colleges and universities seek to not only develop students' associated soft skills but to also build learners core competencies, such as, attitudes and beliefs that are needed for the globalizing knowledge-based economy (Haigh & Clifford, 2011). Today's knowledge economies require highly skilled personnel at all levels to deal with rapid technological changes. To meet current societal needs, colleges and universities around the world have striven to reconstruct assessment procedures to ensure that all students have the necessary attributes to succeed in the twenty-first century. Despite institutions current move toward skills-specific and higher-level learning outcomes, such as, critical thinking, communication, and problem solving, limited study has yet to reveal how students' develop those skills and whether undergraduates who successfully pursue a university degree will develop generic attributes (e.g., written, tolerance, compassion, etc.) and dispositions (e.g., attitudes, beliefs, curiosity, etc.) at the completion of a bachelor's degree.

In the following section, I compare the difference between provider aims and goals of undergraduate education, and student expectations and purposes for completing a university degree relative to generic skills and disposition outcomes of an increasingly globalized future.

a) Higher education providers aims, expectations, goals, and purposes of a bachelor's degree

For many countries, the primary purpose of a higher education system is the education of students. There is ample evidence to suggest that higher education prepare individuals for longer, fuller, and more productive lives. Despite the rising demand for higher education across all countries, many stakeholders, such as, academics, administrators, and senior officials have all started to question the fundamental purpose and value for completing a bachelor's degree. A

recent study by Lagemann and Lewis (2012) in *What is College For? The Public Purpose of Higher Education* suggests that the purpose of higher education has shifted away from the pursuit of economic or employment benefits to now the goal of preparing young students to obtain generic skills and disposition outcomes such as, civic values, ideals, and virtues in order to compete in today's global knowledge economy (Lagemann & Lewis, 2012, p. 10). Lagemann and Lewis (2012) emphasizes that college students in higher education must be able "to develop generic skills and dispositions to listen intently and empathetically to other people; to analyze rationally what is said, read, and observed; to present thoughts clearly; to confront unsupported assertions; and to identify reasonable strategies to take necessary action" (p. 12). In other words, they believe that a bachelor's degree education will allow students to gain numerous soft skills, such as, problem solving, creativity, communication, critical thinking, and creativity skills.

Normally, higher education should be the place where students develop generic skills and social interior attributes aside from employability skills at the completion of a university degree. Often, the most widely cited generic skills are critical thinking, problem solving, interpersonal skills, logical and independent thought, communication and information management skills, intellectual curiosity, creativity, ethical awareness, integrity and tolerance (Bath, Smith, Stein, & Swann, 2004). According to the Council of Ontario Universities(COU), the organization suggest that higher education providers must give students the knowledge and skills they need to make a significant contribution to society (Council of Ontario Universities, 2012). A recent research by Haigh and Clifford (2011) suggests that the purpose of higher education is not only to develop students' employability skills but to also develop student moral values and core competencies. They claim that the purpose and value of higher education is to establish a new generation of citizen who will care about our world relative to personal, social, and environmental

responsibility. Furthermore, the authors outline that higher education should provide students three core values: a) egoistic, b) altruistic, and c) biospheric. Through Wilber's integral theory, an all-inclusive framework that draws on the systematic holistic philosophy, Haigh and Clifford (2011) concludes that higher education institutions must move away from the current emphasis of jobs and skills and rather focus on developing key graduate attributes that are essential toward the social welfare of the entire planet.

Like Haigh and Clifford, Hansen (2011) argues that the aims of higher education are to teach students' generic skills in civic courage, moral judgment, critical thinking, and scientific and global awareness (Lagemann & Lewis, 2012, p. 101). He argues that colleges and universities must aim to integrate the curriculum towards a set skill outside of employability that would prepare students for the democratic society. In other words, Hansen (2011) claims that higher education providers should prepare students to contribute to a civilized society that promote tolerance and debate to entire world. Similarly to Hansen, Sullivan (2011) asserts that the goal of higher education is to provide students with complex knowledge, trained capacities of skillful practices, and a commitment to the purpose espoused by the community (Lagemann & Lewis, 2012, p.104). Likewise, Stoecker and Tryon (2009) suggest that undergraduate education should focus on developing graduates who can make a valued contribution to society. Halpern (1988) once claimed that students completing a bachelor's degree should develop core competencies and skills in six specific areas: 1) knowledge base, 2) thinking skills, 3) language skill, 4) information gathering, 5) interpersonal skills, and 6) practical experience.

Consequently, most past studies have suggested that higher education providers should aim to give undergraduate students a wide range of generic skills that includes but not limited to communication skills, problem-solving skills, self-directed learning skills, ability to integrate

ideas and concepts, and the capacity to work in teams and group environments (Samuelowicz, 1987; Boud, 1988; Chalmers & Volet, 1997; Hambleton, Foster, & Richardson, 1998). The most recent Australian Higher Education Report for the 2003-2005 Triennium outlines that the goal and purpose of higher education is "to enable individuals to develop their capabilities to the highest potential throughout their lives (for personal growth, for effective participation in the workforce, and for the benefit of the economy and society)" (p. 1). Because student learning experience have a positive effect on student development, establishing a clear foundation of what outcomes are most desirable for students is necessary to better understand the key graduate attributes higher education providers should aim to provide at the end of a university degree.

Graduate attributes

For the most part, graduate attributes have been widely used by colleges and universities in many parts of the world to determine the purpose and value of higher education. Since 2000, higher education institutions has place an increasing value on developing graduate attributes in response to calls for accountability processes (Moalosi, Oladiran, & Uziak, 2012). Bowden, Hart, King, Trigwell, and Watts (2000) define graduate attributes as "the qualities, skills, and understandings a university community agrees its student should regardless of their discipline or field of study" (p. 3) More specifically, the authors argues that graduate attributes are essential qualities, traits, and capabilities students should develop and learn during their time in college (Haigh & Clifford, 2011). Barrie (2008) once described graduate attributes as both learners and teachers "becoming the person you can be through university and developing your identity as an educated member of society" (p. 18). He divides graduate attributes into four key characteristics: 1) important things students should learn, 2) learning outcomes of a university education, 2) graduates that will contribute to society both as citizens and workers, and 4) graduates as agents

of social good in an unknown future. Although graduate attributes are now important indicators to meet the desired outcomes of college students, Barrie (2006) claims that there is a "national gap" between the rhetoric of graduate attributes and the reality of the student learning experience (p. 2). He writes, "The extent to which present day university teaching and learning process develop such outcomes in graduates is even more contestable" (Barrie, 2006, p. 216).

Generally speaking, most higher education stakeholders are now required to align their mission and vision relative to graduate or generic attributes. Generic attributes cover soft skills, personal attributes and values which graduates should acquire in their program (Maolosi, Oladiran, & Uziak, 2012, p. 40). A recent study by Benfield and Francis (2008) suggests that higher education institutions must prepare graduates that will reflect their lifelong learning commitment to become 'self-regulating citizens in a globally connected society' (p. 1). Similarly, Nussbaum (2007) claim that higher education providers must prepare graduates to become world-citizens on one's own traditions, such as, the ability to see oneself as a heterogeneous nation and to imagine the lives of people different from one self (Haigh & Clifford, 2011, p. 577). Barnett (1990) once foresaw graduate attributes as the "universities continuing fulfillment of its social obligation to clarify to society the extent to which education is effective in achieving its aims" (p. 13). Nevertheless, graduate attributes are important indicators for providers to gauge the overall efficiency and effectiveness of their campus when assessing the outcomes of college students.

It is important to highlight that the Australian Tertiary Education Quality and Standards Act(TEQSA) - Higher Education Standards Framework have recently proposed that all publicly funded universities in late 2013 will be required to list a set of key graduate attributes providers will give undergraduate students at the completion of a university degree. The Australian

Department of Education, Employment, and Workplace Relations(DEEWR) anticipate that designing and developing a robust online assessment, such as, the Collegiate Learning Assessment(CLA) or the Assessment of Higher Education Learning Outcomes (AHELO), will help higher education institution set, define, and popularize a set of graduate attributes which are considered essential for students to acquire at the completion of a bachelor's degree. Future research should access how this new requirement by the DEEWR will impact higher education aims and goals relative to student outcomes at the completion of undergraduate education in Australia and New Zealand.

b) Undergraduate students aims, expectations, goals, and purposes of a bachelor's degree

Since the turn of 21st century, several researchers such as, Andrew P. Kelly, Parker L. Palmer, and Clayton M. Christensen have all claimed that student expectations and goals of completing a university degree are now greater than ever before. Because higher education institutions now have diverse private and public goals, many undergraduates are expecting higher education providers to inform parents, employers, governments, and taxpayers what graduates will know and be able to do at the completion of higher education. Expectations are the beliefs about student learning process and the structure of knowledge (Mistades, 2007). The nature of what students expect at the completion of a bachelor's degree covers a diverse range of topics in higher education, such as, expectations of first-year experience, expectations of courses and programs, expectations of campus resources and services, as well as expectations of personal and professional development relative to self-skills, interactive skills, intellectual knowledge development, and language skills (Astin, 1993). According to the Secretary of Education's Commission on the Future of Higher Education (2005), the nineteen member outlines that colleges and universities must "become more transparent about cost, price, and student success

outcomes" (p. 4). Although the commission aspires to invest more thoroughly on the "learning outcomes of students", limited research has yet to reveal how students are expected to acquire and obtain those outcomes at the completion of a bachelor's degree education.

To point out, most undergraduate students expect that a university degree will offer them a diverse amount of opportunities to obtain generic or soft skills needed to move forward with the globalized society of the 21st century. 'Generic skills' are defined as "the set of skills that can be broadly applied across different contexts beyond disciplinary content knowledge" (Barrie, 2006, p. 11). A previous study by Lam and Kwan (1999) suggests that students' expect four specific conditions at the completion of a university degree: 1) 'human capital' or to get a job, 2) general benefits from becoming educated in a specific subject matter, 3) maturation and personal development, such as, students' personal development and a place where learners can "grow up" in a rewarding and enriching way, and 4) a foundation that will enable them to move them into rewarding careers. In other words, the authors claim that students should acquire generic skills and disposition outcomes that will allow them to experience personal, social, and intellectual growth aside from economic or employment advantages. They state that, "Students commonly see university as providing them with opportunities for personal development that will lead them to become more mature and rounded people" (Lam & Kwan, 1999, p. 4).

Likewise, Conte and Levine (1997) suggests that most students' expect that a university degree would allow them to: 1) obtain a good job, success, and financial rewards, 2) develop oneself personally or intellectually, 3) help others or improve the world, 4) meet the expectations of others, and 5) avoid other less desirable options in life. The authors emphasize that students' primary intention for completing a university degree is to become more mature and to obtain more opportunities for intellectual and personal advancement in the future. Comparatively,

Tricker (2006) outlines that a university expects to acquire several internship experiences, undergo one semester studying overseas, and gain fluency in a second language at the completion of a university degree. Although there is incredible evidence to claim that student expectations and goals for completing a bachelor's degree in the United States are very similar to student aims and purposes of completing a university degree in Australia, additional research is needed to warrant whether or not students who held optimistic beliefs for completing a bachelor's degree developed more than those who had fearful or more complacent goals when entering and completing undergraduate education.

Social Forces

Historically, the purpose of higher education has continued to change both nationally and internationally since the founding of Harvard College in1636. During the early years, colonial and antebellum colleges would be established to serve American society two primary purposes: 1) settler's determination to live a life different from the government and 2) Protestantism and Anglicanism desire to separate from Catholicism. A large number of colonial institutions would be founded upon Old World models that would serve all types of college students. For instance, Dartmouth College and Yale College were founded by Congregationalists to prepare men for ministers and public servants. Likewise, the College of William and Mary was established to prepare clergymen for civil service in the Anglican Church (Brubacher & Rudy, 2008, p. 19). These colonial institutions along with five others would provide social mobility for young men to integrate religion with society as college would serve as "sanctuaries" for free expression (Guttmann, 1987, p.174).

The social forces leading to the establishment of research universities would transform the public purpose of higher education in American society. Many college students would attend

higher education to establish new scholarly inquiry for the democratic good of society. Guttmann (1987) once asserted that higher education primary purpose was to provide "knowledge for the sake of serving society and knowledge for the sake of serving social demands" (p. 188). Likewise, John Dewey once believed that the purpose of higher education was to teach students to embrace "deliberative democracy", and to extend expertise to as many individual as possible (Lagemann & Lewis, 2012, p. 100). The Yale Report of 1828 once emphasized that the purpose of higher education was to "lay the foundation of a superior education" (Geiger, 2005, p. 48) that would discipline the mind, and prepare "men and women to be desirable citizens and persons as well as specialists and savants" (Brubacher & Rudy, 2008, p. 434). With this in mind, higher education would serve the public purpose by not only providing students knowledge for the sake of serving society but also give learners generic skills and disposition outcomes where all individuals could embrace a democratic society beyond their personal or professional welfare.

Research Assessing Student Outcomes and the "Value-Added" of a Bachelor's Degree

Context

In the United States and throughout the world, attention to the use of "value-added" assessment for accountability purposes has increased exponentially this past decade (Liu, 2011). Since the turn of the new century, both the federal and state government are demanding higher education institutions to provide concrete evidence of what students have learned and what they are able to do at the completion of a bachelor's degree (Ewell, 2002; Kochan & Locke, 2010; Ripley, 2012). Often, most institutions are asked to assess not just student learning or student satisfaction but to also measure faculty teaching and institutional success (Hainline et al., 2010; Teichler, 2012). The added value of postsecondary institution on institutional effectiveness is an important indicator to gauge student intellectual development and the personality of the

institution. Although colleges and universities are continuing to face intensifying pressure from both parents and taxpayers to provide evidence of higher-level outcomes, most higher education providers, quite unfortunately, still provide very little to no data on what students learn and less information on how students should acquire generic skills and core competencies as they progress through their college years (Lumina Foundation, 2011).

Generally, the concept of value-added is defined as "the performance difference between first year and fourth-year students on a standardized test (e.g., ETS Proficiency Profile, CAAP, CLA) after controlling for student admission scores (e.g., SAT/ACT)" (Liu, 2011a, p. 447). According to Voluntary System of Accountability(VSA), value-added is "the learning differences between entering freshmen and graduating seniors for each institution after controlling for common entry measures (e.g., SAT/ACT scores, IQ scores)" (VSA, 2012). In other words, the use of value-added scores allow institutions to determine how much students have learned in college after taking into consideration their prior academic achievement. The value added scores are generally useful because they give higher education stakeholders an opportunity to inform the entire campus their overall efficiency and effectiveness relative to other campuses (Steedle, Kugelmass, & Nemeth, 2010).

Social Forces

Historically, the first institution to use a pure value-added model to measure student learning outcomes was Northeast Missouri State University(NMSU) in 1982, now called Truman State University. The NMSU assessment model, an assessment program devoted to measuring student gains in college, examines student pre-enrollment in college, their growth college years, and their change beyond after graduation (Fincher, 1985). The NMSU program identifies student's strengths and weaknesses in higher education, as well as examines the differences in

student actual performance overtime. Past scholars often view the NMSU value-added assessment model as a program that embraced a "re-commitment to excellence in higher education" (Fincher, 1985). Fincher (1985) suggested that the NMSU assessment program was the first model that assessed intellectual and personal characteristics of the learner, the self-actualization level of graduating students, and the achievement of each student in his or her major (Osigweh, 1986, p 168). Other characteristics, such as, students' factual knowledge, cultural awareness, interpersonal skills, and problem solving skills were also considered during the research experiment.

Despite NMSU courageous attempt to first assess students learning outcomes through a pure value-added model, current researchers have noted that the NMSU assessment model did not fully measure completely the pre-tests and post-tests for student courses in higher education. A few researchers have questioned the overall reliability of the program, as the model did not fully depend on the use of any specific assessment method to measure gains in knowledge, skills, and personal development. According to Osigweh (1986), he claims that the NMSU placed too much emphasis on intellectual and personal characteristics of the learner, the self-actualization level of graduating students, and the achievement of each student in his or her major (p. 168). Furthermore, Osigweh (1986) posits that the pure value-added program examined the favorable impact and positive difference made by an existing program. He noted that value-added data should have been used to: 1) improve student and faculty performance, 2) develop programs and services, 3) evaluate change, and 4) develop short and long goals. The author concludes that measuring the value-added of completing a university degree must depend on reliable measurements of learner overall capability and performance in class (p. 16).

<u>Assessments and accountability in higher education: Historical trends and recent changes</u>

Good assessment metrics in higher education are often difficult for educators to develop. Capturing and measuring student learning outcomes requires sophisticated methodology. Developing an effective methodology that is aligned to the intended learning outcomes is critical to understand the added value of undergraduate education (Biggs & Tang, 2007). To enumerate, assessments are useful for colleges and universities to understand the research productivity of its faculty, while taking into consideration contextual variables such as, the size of the institution, the number of grants received, and the selectivity of the institution (Astin, 1987). Several past studies have noted that reliable assessments are important information for higher education to gauge student learning (Cuenin, 1988; Johnes & Taylor, 1991; Linke, 1991; Kells, 1993; McDaniel, 1996; Cave et al., 1997). Often, the results from the assessments are used for departmental planning and institutional improvement to assure high quality teaching and learning in higher education (Poda, 2007). The information collected is used to aid senior officials to understand the strengths and weaknesses of a program. Although most providers have now set specific criteria and goals as to what students should learn in higher education, limited research has yet to examine the added value of assessing and linking student outcomes to the completion of undergraduate education (Price & Baker, 2012).

From a worldwide perspective, the use of assessment is a growing topic within the field of higher education. Many institutions are now facing intensive scrutiny from both federal and national government to provide solid evidence of their overall efficiency and effectiveness in achieving educational goals (Nedwek & Neal, 1994). Past research that assessed the outcomes of students have ended up measuring the learners' intelligence rather than revealing the impact higher education institutions have made on their learning (Nusche, 2008). Generally speaking, there are four approaches to assess the value-added of student learning in higher education: 1)

comparing students by calculating change against university expected performance, 2) assessments that measure first year and the subsequent year on student expected performance, 3) student engagement in productive learning activity, and 4) employer feedback on the outcomes of student learning (Coates, 2009, p. 3). It is important to note that when measuring the valued-added of student learning, most colleges and universities utilize two types of instruments found in many higher education assessments: 1) direct assessments and 2) self-assessments. Most direct assessments have focused heavily on measuring cognitive outcomes compared to self-assessments. Both direct and self assessments may consist of several formats, such as, written and oral tests, open book examinations, group assessment, peer assessment, assessment by projects, and realistic problem-solving tasks (Poda, 2007).

As of today, there are currently two major types of assessments used to evaluate student outcomes: 1) cross-sectional assessment (assessing the performance of freshmen and seniors at the same time) and 2) longitudinal assessment (assessing the performance of students when they enter the institution and those same students again when they are about to graduate). When deciding between a cross-sectional or longitudinal design, Cheng (2011) recommends higher education institutions to adopt commercial survey instruments that best capture students' collegiate experience and student change when assessing the personal and individual growth of the learner. Because the types, formats, and instruments employed to assess student learning are extremely diverse in nature, current assessments used to evaluate the value-added of completing a university degree has become more politicized and often times highly bureaucratized at both the federal and state level.

<u>Six common types of assessments in higher education:</u>

United States of America

In the United States, there are current three types of assessments primary used to measure student learning outcomes in higher education: 1) Collegiate Learning Assessment(CLA), 2) Student Experience in the Research University Survey(SERU-S), and 3) National Institute for Learning Outcomes Assessment(NILOA).

1) Collegiate Learning Assessment(CLA)

The CLA, a major component of the Voluntary System of Accountability(VSA) program, uses a "value-added" outcome model to evaluate student cognitive skills and two-years of attendance at many colleges and universities in the United States (Arum & Roksa, 2011). To clarify, the CLA utilize the results collected as a means to judge the overall added value of each higher education institution to "assist faculty, department chairs, school administrators and others interested in programmatic change to improve teaching and learning, particularly with respect to strengthening higher order skills" (Rhodes, 2012, p. 38). Like the CLA, the VSA also initiates the ETS Proficiency Profile, formerly called Measure of Academic Proficiency and Progress (MAPP), and the Collegiate Assessment of Academic Proficiency(CAAP) to measure college-level skills in critical thinking, reading, writing and mathematics. Both the ETS Proficiency Profile and CAAP measure students' academic skills through general education rather than the knowledge and skills gained in a course.

Despite the merits of the VSA program, many faculty members and policymakers continue to have mixed reviews surrounding the three higher education assessments when assessing the quantitative component of student general abilities, such as, critical thinking and writing, which are generally not taught in one specific course or discipline (Liu, 2011c, p. 92). From her recent research, Liu (2011b) highlights six primary challenges when utilizing one of the three assessments in the VSA program: 1) Insufficient Evidence of What Outcomes

Assessment Predicts, 2) Methodological Issues with the Current Value-Added Method, 3) Comparability of the Three Tests, 4) No Evidence of the Comparability of Results Between the Preferred Longitudinal Design and the Current Cross-Sectional Design, 5) Unclear Evidence of Student Motivation in Taking Low-Stakes Tests, and 6) Lack of Evidence on the Implications of Outcomes Assessment for Different Types of Institutions (p. 5-6). A most recent report from the National Institute for Learning Outcomes Assessment(NILOA) criticize the VSA program for its inability to assist campus personnel on what the test scores had implied for their institution (Jankowski, Ikenberry, Kinzie & Kuh, 2012). Furthermore, the authors questioned whether the three tests had measured the ability of incoming students or the gains students develop as a result of the college experience (p. 12).

It is important to highlight that the reliability and validity of the CLA test has been heavily criticized from the findings of the book *Academically Adrift* written by Richard Arum and Josipa Roska (Pascarella, Blaich, Martin, & Hanson, 2011). *Academically Adrift* utilizes a 90 minute test from the CLA to measure students' critical thinking, analytic reasoning, problem solving, and written communications skills to answer several open-ended questions about a hypothetical, but realistic situation of student learning (Pascarella, et al., 2011, p. 21). The authors criticize Arum and Roska that the changes made in students' intellectual and moral development appeared to be modest because no assessments has yet to establish a clear standard on how much change students should expect to undergo during college. Moreover, a few researchers have questioned the large number of uncontrolled variables in the CLA, the lack of information the CLA provides on a university to promote student learning, as well as the relatively small sample size utilized to make generalizations about institutional effectiveness (Douglass, Thomson, & Zhao, 2012, p. 3).

A recent study by Douglass, Thomson, and Zhao (2012) compare the difference between the CLA cross-sectional sample and the Student Experience in the Research University Survey (SERU-S) census design. Although the authors praise the merit of using CLA to measure student outcomes, the study hypothesized that the CLA is a 'debatable' assessment compared to the SERU-S in regards to the methodology used and its practical applications for large research universities. Furthermore, Douglass et al. (2012) claim that student surveys used in the SERU-S are the most cost-effective tool compared to the CLA when assessing student outcomes for institutional self-improvement.

To enumerate, several past researchers have questioned the value of the CLA (Banta 2006, 2007, 2009; Pike, 2006). Banta and Pike (2006) complained that the CLA assessment had: 1) small sample size, 2) students were volunteers, 3) too great a dependency on programs and students, 4) too great a focus on statistical significance tests, and 5) too little information regarding how well an institution is performing (p. 322). Similarly, a recent study by Pascarella, Blaich, Martin, and Hanson (2011) emphasizes that until institutional researchers come up with set standards of the expected change students should experience during college, no college or university should use an average score gain from the CLA as an accurate estimate of the value-added effect of higher education (p. 24). In the end, Pascarella et al. suggests that institutional researchers should take extra caution when interpreting the change scores of college students such as the ones found in *Academically Adrift*.

2) Student Experience in the Research University Survey(SERU-S)

Unlike the CLA, the Student Experience in the Research University Survey(SERU-S) is a collaboration between academic scholars and institutional researchers conducted at ten campuses of the University of California system to help institutions understand student undergraduate

experience and student learning outcomes for institutional self-improvement. The SERU-S, based in the Center for Studies in Higher Education at UC Berkeley, is currently the only nationally administered survey to address current policy and scholarly issues that occurs at large research intensive universities (Douglass, Thomson, & Zhao, 2012). More specifically, the SERU-S compiles and generates a rich dataset on several key topics, such as, student academic engagement, experience in the major, participation in research and co-curricular activities, time use, and overall satisfaction with the university experience (Douglass, Thomson, & Zhao, 2012, p. 4). The advantage of utilizing the SERU-S is it allows higher education institutions, especially at large comprehensive research universities, to collect information on student engagement, demographic, student backgrounds, and academic disciplines in relations to student learning outcomes in the university environment. The SERU-S survey is different in that it uses a retrospective posttest design to measure self-reported learning outcomes. A retrospective posttest design is an effective way to assess learners' self-reported changes in knowledge, awareness, skills, confidence, attitudes or behaviors (Howard et al., 1979). Although the retrospective posttest may provide more reliable information on the current changes of undergraduate students, several scholars, policymakers and institutional researchers have noted that a retrospective posttest design may produce biased ratings (Hill & Betz, 2005; Taylor et al., 2009). Other educators have suggested that the retrospective pretest design may create the least social desirability bias compared to other design approaches (Lam and Bengo, 2004; Krosnick, 1991). Despite a few criticisms, the overall use of the SERU-S may be worth replicating when assessing student outcomes at large research universities like the University of Auckland.

3) National Institute for Learning Outcomes Assessment(NILOA)

Compared to the SERU-S, the National Institute for Learning Outcomes Assessment (NILOA) seeks to assess college student learning outcomes by documenting what students learn, know, and can do at the completion of a university degree. Recently established in 2008, the NILOA utilizes current data collected by institutional researchers "to inform and strengthen undergraduate education, and to communicate with policymakers, families, and other stakeholders of student individual growth" (NILOA, 2012) during their years in college. Through the use of web-based surveys, the assessment primary goal is to collect, analyze, and interpret the results of student learning to inform institutional researchers and universities what must be done to improve student learning outcomes as a whole. Because the NILOA is still relatively new in higher education, additional research should be conducted next year to examine the feasibility and reliability to fully capture the learning outcomes of college students.

It is important to note in this literature that the NILOA is conducted and designed by several renowned academics and policymakers from the highly acclaimed National Survey of Student Engagement(NSSE). The NSSE measures student engagement and the degree to which institutions provide college students with an effective learning environment (Kuh & Hu, 2001). To clarify, the survey utilizes a well-developed, validated set of items to gauge a variety of student behaviors and experiences related to engagement with their higher education experience (Gordon, Ludlum, & Hoey, 2008, p. 20). A major component of the NSSE are its five benchmark scales – 1) level of academic challenge, 2) active and collaborative learning, 3) student-faculty interaction, 4) enriching educational experiences, and 5) supportive campus environment (NSSE, 2008). Through the NSSE, the five benchmarks are primarily used to make general comparisons among institutions and institutional types in regards to how students devote their time and energy to educationally purposeful activities (Kuh, 2001). Despite the merits of the NSSE, several past

studies have suggested that the NSSE instruments do not directly assess student outcomes and should be ultimately avoided when measuring student learning relative to generic skills and disposition outcomes of a bachelor's degree program (Kuh & Hu, 2001).

Australia and New Zealand

Unlike the United States, the three most common types of assessment used to measure college student learning outcomes in Australia and New Zealand are: 4) Assessing Higher Education Learning Outcome(AHELO), 5) Australian Graduate Skills Assessment(GSA), and 6) Course Experience Questionnaire(CEQ).

4) Assessing Higher Education Learning Outcome (AHELO)

The AHELO, recently founded by the Organization for Economic Co-operation and Development(OECD) in January 2010, investigates the feasibility of students learning across different cultures and languages to gauge students' "generic skills" at the beginning and end of a bachelor's degree program (Douglass, Thomson, & Zhao, 2012, p. 2). According to the OECD (2010), the AHELO examine student learning by measuring three specific core areas: 1) generic skills common to all students, 2) discipline-specific skills, and 3) contextual information, such as, student background and the learning environment. The AHELO program seeks to inform OECD in similar fashion to the Program for International Student Assessment(PISA) that measure what students know and can do (e.g., critical thinking, analytical reasoning, problem-solving, and written communication) upon graduation. The challenge of AHELO, however, remains whether or not institutional researchers can fully understand how to account for the cultural differences of a country when gauging student's generic and dispositional skills (Douglass, Thomson, & Zhao, 2012). Further research should be conducted to examine the feasibility and reliability of AHELO to fully capture the learning outcomes of college students.

5) Australian Graduate Skills Assessment(GSA)

Like the AHELO, the Australian Graduate Skills Assessment(GSA) asks students to rate their skills in regards to critical thinking, problem solving, interpersonal understanding, and written communication. First designed and initiated by the Australian Council for Educational Research(ACER) in October 2000, the assessment seeks to measure key generic skills undergraduate students should develop in their first and final year of study. To clarify, the assessment seeks to provide a standardized, objective measure of four generic skills – critical thinking, problem solving, interpersonal skills, and written communication to test skills levels of disciplinary content and curricula (Hambur, Rowe, & Luc, 2002). Through an eighty-three multiple-choice questions and two writing tasks, the test seeks to outline student overall performance of study, year level, and language spoken at home that are relevant to university achievement and graduate work (Butler & Hambur, 2011). At the completion of the assessment, all participants receive a free authorized GSA report in which students could utilize for academic and/or professional reference. Despite the merits of the GSA, several scholars have criticized the GSA for its lack of ability to assess between generic skills and academic achievement among undergraduate students (Hambur, Rowe, & Luc, 2002; Chanock, Clerehan, Moore, & Prince, 2004; Clearly, Flynn, Thomasson, Alexander, & McDonald, 2007).

6) Course Experience Questionnaire(CEQ)

Compare to the AHELO, the Course Experience Questionnaire(CEQ) examines students' teamwork, work abilities, and confidence in tackling unfamiliar situations (Douglass, Thomson, & Zhao, 2012). The CEQ, founded by the Graduate Careers Australia(GCA) in 1993, utilizes a five-point scale to assess and measure the levels of student satisfaction in a course. The assessment asks undergraduate students to rate their agreement or disagreement of a course, and

to choose from a range of additional scales to measure different pedagogical constructs (CEQ, 2012). More specifically, the CEQ seeks to use the 'Generic Skills Scale(GSS)' in which students self-assess the extent to which their course of study has contributed to the development of their generic skills (Wilson, Lizzio, & Ramsden, 1997). The scale is broken into six items: 1) problem solving skills, 2) analytic skills, 3) the ability to work as a team member, 4) the confident/ability to tackle unfamiliar problems, 5) written communication skills, and 6) ability to work on my own (Griffin, Coates, Mcinnis, & James, 2003). Typically, institutions use the results of the CEQ to provide information on the benefits and constraints of a particular course and the comparisons within fields of study (Griffin, 2003). Despite the merits of the CEQ, past researchers has criticized the CEQ for its lack of data available to make future sustainable improvement needed by academic heads and chairs in higher education (Tucker, Jones, & Straker, 2008). Tucker et al. suggest that the CEQ provides: 1) little information to improve teaching and learning, 2) limit data on unit level, 3) evaluates and targets academics, 4) lack of feedback are given to students, and 5) create useless strains for academics and administrators. Additional research should be conducted to determine whether or not CEQ evaluates teaching and learning relative to student outcomes in higher education.

Summary

Despite the vast number of current assessments used to measure student outcomes in both the United States and Australasia, limited to no research has yet to fully conduct a large-scale longitudinal study to assess student outcomes relative to the "value-added" of students' completing a bachelor's degree in the Asia-Pacific. Generally, most student surveys and questionnaires in the Asia-Pacific focus on developing student competency levels. For instance, a recent study by Spronken-Smith, Bond, Darrou, McLean, Jenkins, and Leonard (2012) from

New Zealand indicate that current higher education assessments used to measuure graduate attributes at all seven public research universities in New Zealand have recently existed the past couple years. From these recent initiatives, limited information has yet to fully reveal in-depth the overall institutional engagement with student outcomes, particularly around student assessment and course evaluation. The Australian Government once outlined eight key graduate competencies students' should gain at the completion of higher education: 1) finding and using information, 2) communicating, 3) planning and organizing, 4) working with others and in teams, 5) numeracy, 6) problem solving, 7) using technology, and 8) using cultural understandings (Ministerial Council for Education, Employment, Training and Youth Affairs, 1996). Further research should be initiated to evaluate which of the following six major assessments best capture student outcomes relative to generic skills and disposition outcomes of a university degree in the Asia-Pacific.

Research Assessing the Social, Cultural, and Environmental Factors that Contribute to Graduate Attributes and Generic Skills in Higher Education

Context

Student learning outcomes are identified and recognized by many higher education stakeholders as an important outcome to be measured as a "value-added" feature of colleges and universities. Prior research on college student development have primarily focused on students' learning experiences, student levels of engagement, student satisfaction, and career plans after college (Johnson, McCormick, Prus, & Rogers, 1993). Measuring the outcomes of college students, however, has been growing topic for researchers and senior officials in higher education. Learning outcomes are often referred to the changes or benefits that follow as a result of student learning experience (Nusche, 2008). Often, outcomes describe what the student

actually achieves, as opposed to what the institution intends to teach (Allan, 1996). Otter (1992) defines learning outcomes as "what a learner knows or can do as a result of learning" (p. 23). Despite recent attempts by scholars to outline one specific assessment that best capture all learning outcomes of students, most accrediting bodies still require institutions to conduct some form of measurement to assess and gauge student learning in higher education (Ewell, 2005).

To enumerate, student learning has many dimensions of which some are easier to measure than others (Liu, 2011). According to Astin (1984), student learning is not simply the consequence of an institution's educational quality but rather a function of students' active engagement with the learning opportunities. For instance, institutional learning is often referred to as the knowledge, abilities, and skills that result from student engagement. Often, the levels of student engagement are considered an important predictor for understanding student learning experiences in higher education. According to the National Survey of Student Engagement(NSSE), student engagement is "the activities and conditions that generate high quality learning" (NSSE, 2008, p. 1). Measuring student engagement provides institutions a clearer picture of what undergraduate students are actually doing and how students participate in educationally purposeful activities. Numerous past studies have suggested that high levels of student engagement and involvement are linked to higher quality of learning and development (Astin, 1979, 1993; Pace, 1995; Chickering & Gamson, 1987; Pascarella & Terenzini, 2005).

With this in mind, it is important to note that the levels of student engagement are often associated with student satisfaction. Understanding student satisfaction is an important part of understanding the educational process and quality of an individual experience (Hearn, 1985). Donald and Denison (1996) suggests that the two most important indicators for colleges and universities are: 1) to develop a clear university mission and 2) to embrace student satisfaction

on-campus. From their study, they suggest that the levels of satisfaction can provide substantial information to academic and senior officials when developing more effective programs on curriculum, teaching methods, and student services (Donald & Denison, 1996, p. 36). Normally, student satisfaction is not examined thoroughly in discussions of higher education outcomes (Astin, 1993). Though the levels of student satisfaction are rarely assessed to measure student outcomes, the levels of student satisfaction are still important indicators when assessing student developmental process and institutional effectiveness (Braskamp et al., 1979; Cameron, 1981).

Three approaches for understanding the different dimensions of student learning:

a) Cognitive Outcomes

College student learning involves many factors related to cognitive outcomes. Generally speaking, cognitive learning is the recognition of knowledge and the development of intellectual abilities and skills (Strike & Posner, 1992). Shavelson and Huang (2003) define cognitive learning outcomes as "the range from domain-specific knowledge to the most general reasoning and problem-solving skills" (p. 13). Most cognitive outcomes tend to derive from Bloom et al.'s (1956) taxonomy of educational objectives, in which education providers measure students' factual knowledge and comprehension such as, academic skills in application, synthesis, analysis, and evaluation. In other words, cognitive outcomes are well closely aligned to generic skills outcomes (Nusche, 2008, p. 9). Both approach measure different subject areas and contextual situations, such as, quantitative reasoning, information processing, comprehension, critical thinking, and evaluation of new ideas.

Not surprisingly, numerous past studies have emphasized that student's would gain greater cognitive skills during their college years from freshman year to senior year (Barrows, Clark, & Klein, 1980; Barrows et al., 1981; Cogan, Torneypurta, & Anderson, 1988). Similarly,

a recent study by Steur, Jansen, and Hofman (2012) suggests that students develop problem solving, professional expertise, and lifelong learning skills at the completion of undergraduate education. Through the use of an online questionnaire, the authors found that learning to develop research skills, team work skills, and creativity skills are salient characteristics for students' to develop at the completion of a university degree. Because there is a huge "national gap" between what students expect from a bachelor's degree and what undergraduate education provides undergraduate students (Jones, 2011), Steur et al. study is noteworthy in that it claims how the formative merits of pursuing a university degree are linked to reflective thinking, scholarship, moral citizenship, and life-long learning. The authors believe that reflective thinking underlies scholarship, moral citizen, and lifelong learning.

Like Steur et al., Astin (1993) examined the value-added and average gains in critical thinking skills among undergraduate students in the 1990s. He suggested that student outcomes that are relative to skills and beliefs allow colleges and universities to better understand how well a program develops. Piaget (1964) once observed that the cognitive-structural theories of student development occur best when students are challenged. He claims that students who are challenged encounter greater information or experiences in regards to student cognitive structure (Pascarella & Terenzini, 1991). Often, this process is coined as flow theory (Csikszentmihalyi, 1998), in which a learner experiences the emotions of performing and learning. A past study by Pace (1974) suggested that students who had a positive college experience gained several generic and cognitive skills over that time: "79 percent gains for vocabulary and facts in various fields, 64 percent gains for awareness of different philosophies, cultures, 62 percent gains for broadened literary acquaintance and appreciation, and 54 percent gains for understanding the appreciating science and technology" (Pascarella & Terenzini, 1991, p. 105). Likewise, students who were

actively involved in academic and co-curricular activities gained more from their college experience than students who are not as involved (Astin, 1993; Pascarella & Terenzini, 2005).

Historically, several past studies have claimed that interacting with major socializing agents such as, faculty and peers are linked to general cognitive gains during college (Wilson, Gaff, Dienst, Wood, & Bavry, 1975; Pascarella & Terenzini, 1978, 1980; Endo & Harpel, 1983; Volkwein, King, & Terenzini, 1986). Typically, undergraduate students make gains on cognitive capabilities and skills in a number of dimensions throughout their college years. For instance, instructors who employ different instructional strategies can encourage students to make larger cognitive gains in critical thinking and problem solving skills (Beckman, 1956; Jones, 1974; Shuch, 1975; Bailey, 1979; Kurfass, 1988). Scholars often describe this phenomenon as a maturation process, or an intellectual and interpersonal influence. Further research should examine how students achieve those desired cognitive outcomes during their time in college.

b) Environmental Factors on Cognitive Outcomes

Aside from social and cultural factors, literature has also shown that environmental factors, such as, gender and race, influence how and what students learn in higher education (Belenky, Clynchy, Goldberger, & Tarule, 1986; Oakes, 1990; Baxter-Magolda, 1992; Lundberg & Diemart, 1995; Martinez-Aleman, 1997). Numerous past studies have suggested that racial/ethnic inequalities in post-secondary outcomes, such as, GPA, graduation rates, and GRE scores (Bowen & Bok, 1998; ETS, 2008; Planty et al., 2009), can lead to small gains for African-American students, particularly in critical thinking skills (Pascarella & Terenzini, 2005). To clarify, several studies have revealed through the CLA assessment that there is a large cognitive skills gap between Black and white students (Arum & Roksa, 2008; Flowers & Pascarella, 2008). Scholars project that the institutional size of a campus may lead to negative outcomes for

African-Americans seeking to make cognitive gains in college (Dey, 1991). Researchers have also noted that racial diversity on college campuses can significantly affect the levels of student learning developmentt (Gurin et al., 2002; Chang et al., 2005). Moreover, past research has suggested that undergraduate students tend to develop more cognitive skills at colleges and universities that enroll higher-achieving students, especially at highly selective institutions dominated by White and Asian-American students (Kugelmass & Ready, 2011).

Like gender and race, a recent study by Cabrera, Colbeck, and Terenzini (2001) suggests that effective instructional practices can lead to higher gains on student cognitive outcomes, particularly those individual in the field of engineering and sciences. The authors claim that faculty members who interact with students frequently and provide constructive feedback can influence not only their critical thinking skills but also their social and practical awareness of what engineering occupation is all about (p. 343). Additional research should examine how other environmental factors (e.g., campus facilities) affect student cognitive outcomes.

c) Non-cognitive outcomes (Attitudes, Beliefs, and Values)

Aside from cognitive outcomes, undergraduate students also develop non-cognitive outcomes at the completion of a bachelor's degree. Non-cognitive outcomes are often viewed as the changes in beliefs or the development of certain values as a result of the college experience (Ewell, 2005). Most higher education providers are expected to promote non-cognitive developments on-campus in which students develop dispositional attitudes and beliefs through classroom instruction, out-of-class activities, and group projects/assignments. Measuring non-cognitive outcomes for students are essential for institutional researchers to evaluate the added value of completing a bachelor's degree (Pearson & Chaterjee, 2004). Furthermore, assessing non-cognitive outcomes allows institutions to better inform their local communities that the

university values non-cognitive learning. Non-cognitive outcomes may consist of alumni, government, and/or community organization support to foster institutional self-improvement.

Historically, past studies on non-cognitive learning outcomes have focused on the presence or absence of certain theorized stages of student development (Pascarella & Terenzini, 2005). Other studies have identified non-cognitive outcomes as the social maturation or generational effects (Volkwein, 2003). Typically, non-cognitive outcomes consist of psychosocial changes in developments, attitudes, beliefs, and values. Although measuring non-cognitive outcomes is highly important to assess student outcomes, numerous past studies have suggested that student attitudes, beliefs, and beliefs are generally difficult to measure because many assessments have indirectly examined students through questionnaires and/or surveys based on perceptions rather than the factual knowledge (Nusche, 2008). A recent study by Ewell (2005) recommends that higher education should use student portfolios to indirectly examine student outcomes and competencies. He claims that student portfolios are useful to directly measure student academic work, such as, written assignments, field performances, laboratory reports, etc. Additional research should examine whether or not student portfolios should be considered when assessing student outcomes in higher education.

Summary and Conclusion

In essence, drastic changes in accountability and assessment over the past two decades have posed considerable challenges as both the United States and Australia/New Zealand seek to compete in both national and international markets. This literature has laid out several blueprints that are in need for further research. Moreover, this review has described the conceptual lenses that will be used to evaluate the central questions concerning the purpose and value of higher education, and the extent to which a bachelor's degree will provide or not provide an added

value for both higher education providers and students. The challenges facing assessment and accountability in higher education have created a complex set of questions: is there a consensus as to what the goals of a bachelor's degree education are in terms of generic and dispositional attitudes? Can higher education institutions move beyond compliance and defiance when assessing and measuring student learning outcomes? Will there be a reliable assessment (e.g., CLA, SERU-S, NILOA, AHELO, CEQ, etc.) to effectively measure the "value-added" of completing a university degree? Answering such questions in relation to these overlapping complexities is immensely difficult. It requires not only analytical skills and understandings, but also an interpretive grasp of the ethical and political issue facing university education in the 21st century.

Research Questions

1. What are the differences between students' and institutional overall aims, expectations, goals, outcomes, and purposes with regards to generic skills and dispositional outcomes of a bachelor's degree education? Are there any similarities or differences? Is there a consensus as to what the goals of a bachelor's degree education are in terms of generic skills or core competencies?
2. What is the most feasible assessment (e.g., CLA, SERU-S, NILOA, AHELO) to measure the "value-added" of completing a university degree in the Asia-Pacific? What are the advantages and disadvantages of the research design and methods utilized by CLA, SERU-S, NILOA, or AHELO? How can institutions move beyond compliance and defiance when assessing and measuring student learning outcomes?
3. What are the social, cultural, historical, political, and environmental factors that contribute to students learning outcomes in higher education? How are undergraduate students' achieving those desired outcomes (e.g., cognitive outcomes, non-cognitive outcomes, etc.)?

Proposed Timeline

* Within the first 6 months (*January 2013 – June 2013*): A clear set of highly valued outcomes based on this literature review will be identified and considered. This literature anticipate to provide greater clarity of understanding and agreement among the University senior management team on the value-added outcomes set to take place by the School and Department leaders. Faculty members will later be asked to provide feedback on what they think are important outcomes to student learning in higher education. The benefit of such discussion is to develop a greater awareness of and sensitivity to the full range of goals and outcomes that are valued at the University of Auckland.

* Within the 12 months (*January 2013 – December 2013*): A first-round of measures will be taken for the recommended outcomes from the literature review. A targeted stratified sample will be pursued within the Faculty of Education to provide a range of outcomes-related data that will increase the awareness of participants as to the valued-added outcomes of a bachelor's degree.

* Within 24 months (*January 2013 – December 2014*): An initial analysis of cross-sectional differences for the recommended outcomes will be available for consideration by The University of Auckland senior management team and academic staff as the basis for determining how the impact evaluation and monitoring process can be designed and implemented in all Faculties and disciplines. The Faculty of Education will serve as a consultant as to whether the observed outcomes are in accordance with expectations, and whether any changes if any, should be considered in the study. It is anticipated that the author of the literature review, Roy Y. Chan, will be present to assist, collect, and/or analyze the data with the research team at the University of Auckland, Faculty of Education.

* Beyond 24 months (*January 2015 – January 2016*): It is expected that longitudinal assessment will lead to continued improvement in the delivery of teaching within the university. The study anticipate to have a direct impact on student learning outcomes as the university focuses its attention on ensuring the valued-added outcomes are present within each Faculty and Departments.

Methodology

This proposed doctoral dissertation will utilize a proof-of-concept carried out in the Faculty of Education at the University of Auckland. A comparative cross-section of entering and graduating students will be implemented. Results will be used to develop mechanisms that have been empirically validated in which other departments, schools and institutions can utilize within their own contexts and outcomes.

At the beginning of the project, a proposed modified Delphi survey study will be carried out initially with University's senior academic leaders from the University of Auckland. Afterwards, measurement from the Collegiate Learning Assessment(CLA), Student Experience in the Research University Survey(SERU-S), or the National Institute for Learning Outcomes Assessment(NILOA) will be selected to establish, which measures would best capture student learning outcomes. If new measures are needed, standard tests and effective instrument development procedures will be used to operationalize the outcomes.

Eventually, a non-equivalent group of freshman and senior year students will be analyzed utilizing a multivariate analysis of variance to determine whether differences exist in cohort skill performance or self-reported attitudes. These results will be used primarily as a proof-of-concept. It is expected that this approach will be sufficiently robust to establish the validity of the selected measures and provide a basis for the design of longitudinal study that tracks the development of outcomes through the trajectory of completing a bachelor's degree.

This work extends current work by deliberately focusing on the need to measure the outcomes of bachelor degree instruction relative to intended outcomes. Further, it seeks to raise institutional engagement in graduate attributes by modeling a measurement methodology and making such engagement a key part of institutional strategy.

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