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Exploring the Relationship Between Academic Program Assessment Practices and Institutional Performance

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EXPLORING THE RELATIONSHIP BETWEEN ACADEMIC PROGRAM ASSESSMENT PRACTICES AND INSTITUTIONAL PERFORMANCE

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Education

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Abstract


Researchers (Stanny & Bryan, 2021; Tinto, 2012) have claimed without empirical evidence that academic program assessment is important to student success. This study used structural equation modeling (SEM) to identify the relationships between academic program assessment practices and institutional performance based on responses from faculty at U.S.-located four-year institutions of higher education. The theoretical foundations of best practices in program assessment, organizational learning, faculty motivation, and institutional performance were examined and included as the primary variables. Assessment practices in higher education are best summarized by the assessment loop: articulating the intended learning outcomes; selecting appropriate assessment measures; developing curriculum and learning activities; and closing the loop. In the final model, 23.6% of the variance in institutional performance was explained by the other variables, providing empirical support that implementing assessment best practices does contribute to institutional performance. An update to the established assessment loop was proposed to better extricate what “closing the assessment loop” entails based on organizational learning (Dixon, 1994).

Keywords: Assessment practices, Closing the loop, Organizational learning, Assessment Cycle, Institutional Performance, Faculty Motivation
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CHAPTER ONE: INTRODUCTION

External entities are increasing their scrutiny of higher education. Americans progressively hold the opinion that four-year college degrees are not worth the expense and time (Belkin, 2023). Employers, including both state governments (O’Connell-Domenech, 2023) and private corporations (J. B. Fuller et al., 2022), continue to drop requirements for a bachelor’s degree that many entry-level positions once held. The Burning Glass Institute found that employers are dropping bachelor’s degree requirements in their job postings and replacing them with more specific skill requirements such as soft skills or social skills (Belkin, 2023). Historically, it was assumed that anyone with a bachelor’s degree had sufficient soft skills such as teamwork and self-discipline (J. B. Fuller et al., 2022). That is no longer an assumption.

Alongside rising tuition costs, institutions of higher education are fighting to remain relevant in the post-high school labor market amid the rise of micro-credentialing and employer-sponsored education programs (Belkin, 2023; J. B. Fuller et al., 2022). Since the mid-1990s, state and national governments have taken a utilitarian view of post-secondary education and began seeking greater accountability from institutions. Those institutions unable to demonstrate their utility to those entrusted with managing public funds will have limited success (Alexander, 2000). Bailey and Belfield (2019) identified the ongoing tension between skill-based or career and technical education and education resulting in associate’s
or bachelor’s degrees. They argued that there is no need for the tension as students, regardless of the type of education they are seeking, are looking to increase their employment prospects. Additionally, both academic degrees and skill certificates purpose to and should offer students a solid foundation of general skills, such as critical thinking and communication, as well as occupational skills for jobs to which they aspire. Educational leaders and faculty should work to ensure that any educational pathway a student chooses provides those skills (Bailey & Belfield, 2019).

Ultimately, the public is looking to higher education to produce a quality product in their graduates who will meet the current needs of the economy. The public’s desire for quality and value should be what drives institutions of higher education (Baer, 2017; Suskie, 2014). According to Suskie (2014), a quality institution is one that continuously seeks excellence in being relevant to their stakeholders, with a positive culture of respect and collegiality, in achieving and demonstrating that it is meeting its mission, and is continuously improving. The national accreditors believe that goals and assessment activities are symbiotic because goals inform assessment strategies, and evidence from the assessment strategies inform future goals and plans (Suskie, 2014).

**Statement of the Problem**

Higher education institutions in the United States are currently facing increasing costs leading to increased public scrutiny to prove the quality of their product and the value they offer to society (Alexander, 2000; Belkin, 2023; J. B. Fuller et al., 2022; Ikenberry & Kuh, 2015). Therefore, national accrediting associations have increased their focus on the assessment of student learning (Fischer, 2022; Suskie, 2014). Ikenberry (2015) suggested that
quality in higher education institutions will be established by students, faculty, and institutions that can create organizations that best facilitate teaching and learning.

Tinto (2012) suggested that students are more likely to persist at institutions that demonstrate quality through ongoing assessment activities because institutional leadership are looking to continuously improve the programs offered at the institution. He went on to argue that academic programs are the pin around which student persistence and retention efforts should be centered because classrooms are the common space that all students experience at an institution (Tinto, 2012). Stanny and Bryan (2021) echoed Tinto, encouraging institutions to support academic program improvement because it can enhance the quality of the academic programs. Stitt-Bergh et al. (2019) argued that a system of strong assessment activities would increase equity at the institution, provide a better understanding of the academic program, and lead to greater student persistence and retention, all in benefit to the public good. Yet none of these researchers cited empirical evidence to support their claims of a relationship between assessment activities and institutional performance or student persistence. Banta (2009) questioned if assessment activities at the institutional level make a difference. This research study examined the supposed relationship between academic program assessment activities and institutional performance.

Conceptual Framework

Assessment for improvement in higher education is centered on student learning outcomes at the course, program, and institutional levels. Faculty assess what students are learning and provide assurance to external stakeholders that students are learning and faculty are making changes necessary to increase students’ learning (Dorime-Williams et al., 2022; Gray, 2002; Huba & Freed, 2000; Suskie, 2009). This assessment practice occurs within a
culture that impacts and is impacted by the policies and processes of the institution (M. B. Fuller, 2011) which impacts the motivation of faculty to complete or not complete the activities (Baas et al., 2016). Organizational learning is the process of gaining and implementing knowledge throughout an organization and occurs at the individual-, group-, and organizational-level, impacting both the non-human aspects of the organization and the process of learning at the individual and group levels (Bontis et al., 2002; Dixon, 1994). This study explored how faculty motivations (R. M. Ryan & Deci, 2000) and organizational learning (Argyris, 1994; Argyris & Schon, 1978; Senge, 2006) impact the implementation of assessment practices and institutional performance.

**Assessment in Higher Education**

Assessment practices in higher education are multi-faceted. They include assessment of assignments, courses, academic programs, co-curricular programs, and the institution. Assessing assignments, courses, and academic programs are the primary responsibility and purview of faculty members (Dorime-Williams et al., 2022; Gray, 2002; Huba & Freed, 2000; Suskie, 2009). Beyond their immediate courses, faculty are motivated differently for assessing the academic programs (Skidmore et al., 2018). Institutional leaders have a responsibility from external stakeholders to ensure that assessment practices are implemented throughout their institution (Suskie, 2014). This responsibility is often manifested in institutional policies and procedures, support systems such as professional development resources, and communication of the results of assessment practices to internal and external stakeholders, collectively referred to as an assessment culture (M. B. Fuller & Skidmore, 2014). Additionally, specialized program accreditors place expectations directly on the academic programs, creating differences in expectations and operations among academic
disciplines (Boyce, 2003). The interplay of faculty motivation and institutional policies and procedures create an organizational culture that influences the practice and implementation of assessment practices (M. B. Fuller & Skidmore, 2014; Skidmore et al., 2018).

**Organizational Culture**

Organizational culture, according to Schein (2017), has a powerful effect on group behavior. Defined as the shared and accumulated learning of a group, it becomes a pattern or system of beliefs, values, and behavioral norms that are unconsciously embedded in the organization (Schein, 2017). Any group of individuals can have a culture and it is possible to have multiple cultures within a single organization, such as subcultures of academic disciplines in higher education (Boyce, 2003; Schein, 2017).

Many authors (Baas et al., 2016; Banta, 2002; M. B. Fuller, 2013; Ndoye & Parker, 2010; Weiner, 2009) have found significant influences of faculty upon the assessment systems in institutions of higher education. Skidmore et al. (2018) identified four typologies of faculty motivation toward assessment practices: fear, compliance, evolving student learning, and student learning. They concluded that understanding how faculty perceive assessment at their institutions is important to engaging them in inquiry and dialogue throughout the assessment process (Skidmore et al., 2018). To measure faculty motivation, the concepts of motivation and regulation from self-determination theory were used (Deci & Ryan, 2000a; R. M. Ryan & Deci, 2020) The conceptual framework for this study connects the cultural influence of faculty motivations for assessment to the implementation of assessment practices.
Organizational Learning

In organizational learning theory, Argyris and Schon (Argyris, 1995, 2003; Argyris & Schon, 1978) identified learning as the detection and correction of errors within an organization. Learning is done primarily by individuals but becomes embedded into the organization through meaning structures or theories of actions that inform individuals of strategies that should be used to achieve the intended outcomes (Argyris, 1995). These meaning structures become part of the psyche of the organization and may be espoused, describing how the organization believes and articulates how members are expected to act, or a theory-in-use, describing how the organization does act, usually from the underlying and often unknown values and assumptions (Argyris, 1995; Argyris & Schon, 1978). This institutionalized knowledge becomes part of the organizational culture.

Learning at the individual or group level can occur when there is a match between what was expected and what was achieved. Learning can also occur when there is a mismatch between what was expected and what ensued, and a correction happens with the goal of aligning the mismatch between expectations and reality. In assessment activities, a mismatch may include a difference between the expected student learning outcomes and the actual student learning outcomes. Once the results of the assessment activities become “non-human” in such things as policies, strategies, and cultures, they are considered to be part of the organization-level learning (Bontis et al., 2002) that impacts both individual-level learning and group-level learning. The interaction of individual-, group-, and organizational-level learning is identified holistically as “organizational learning.”
Research Questions

Structural equation modeling was performed to examine the relationships between these concepts, addressing the following research questions based on the hypothesized model displayed in Figure 1.

1) Does the hypothesized model for Organizational Learning, Faculty Motivation, Implementation of Assessment Practices, and Institutional Performance produce an estimated population covariance matrix that is consistent with the sample covariance matrix? If the data do not fit the model, can the model be improved?

2) How much of the variance in Institutional Performance can be explained by the combined effect of Motivation, Organizational Learning, and Implementation of Assessment Practices in the model?

3) What are the direct effects, indirect effects, and total effects among the variables?

Figure 1

Hypothesized Model
Definition of Relevant Terms

Academic Program: an instructional program leading toward an undergraduate or graduate degree, or certificate (U.S. Department of Education, National Center for Education Statistics, 2022)

Assessment: the systematic process to gather, analyze, interpret, and use information and evidence to improve student learning (Allen, 2004; Huba & Freed, 2000; Ikenberry & Kuh, 2015; Suskie, 2009)

Assessment Culture: a system of deeply embedded, collectively held beliefs and values about institutional assessment practices that support student learning outcomes (M. B. Fuller et al., 2016; Lakos & Phipps, 2004; Maki, 2010; Walker, 2020; Weiner, 2009).

Meaning Structures: beliefs and assumptions to organize data, make sense of it, and give it meaning; can be held by an individual or a collective (Dixon, 1994; Senge, 2006)

Organization Learning: “the intentional use of learning processes at the individual, group, and system level to continuously transform the organization in a direction that is increasingly satisfying to stakeholders” (Dixon, 1994, p. 5)

Organizational Culture: “the accumulated shared learning of that group as it solves problems of external adaptation and internal integration; which has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, feel, and behave in relation to those problems” (Schein, 2017, p. 6)

Organization of the Study

This dissertation is organized into five primary chapters. The first chapter included the background, the statement of the problem, introduced the conceptual framework, the hypothesized model and corresponding research questions, and defined relevant terms to be
used throughout the study. The second chapter expands on the conceptual model, introduces the hypothesized model, and examines current literature on assessment, organizational culture, organizational learning, and institutional performance. The third chapter outlines the methodology used to address the research questions. Results of the study are discussed in Chapter Four and Chapter Five summarizes the conclusions and recommendations.
CHAPTER TWO: LITERATURE REVIEW

American institutions of higher education are facing increased competition from alternative licensure programs and the public’s desire to control costs (Belkin, 2023). As state and national governments continue to spend significant public funds supporting higher education, legislators expect institutional leaders to demonstrate the effectiveness of their institutions in terms of student learning, course and academic program completion, and job placement (Bailey & Belfield, 2019; Suskie, 2014). National accrediting bodies and specialized program accreditors require institutional leaders and academic program directors to be more deliberate in assessing their programs. Such actions hold institutions accountable for ensuring that students are learning what the institution claims they are learning through their academic programs (Baer, 2017; Fisher et al., 2014; Suskie, 2014).

There is a consensus among researchers that having an institutional culture in which regular assessment is the norm leads to greater student persistence and retention (Elliott, 2018; Fulcher et al., 2014; Tinto, 2012). It is believed that regular assessment should lead to continuous improvement in academic programs (Watkins & Marsick, 1993). Academic programs are the foundation of education and the only experience within the institution that all students share (Stanny & Bryan, 2021; Tinto, 2012). However, Banta et al. (2009) questioned if assessment activities make a difference at the institutional level. And despite
the consensus that assessment practices lead to greater persistence and retention, no empirical evidence has been found to support such a claim.

This review of current literature defines and situates assessment within the higher education context, details research on cultures of assessment in higher education, identifies best practices of academic program level assessment, and examines organizational learning theory’s application to assessment in higher education. Finally, methods of measuring institutional performance are considered.

**Theoretical Framework**

As a researcher, I approach research through a pragmatic lens, using the research to identify solutions to inform practice and promote change (Dewey, 1915/1997; Saunders et al., 2012). Those considered the founders of pragmatism, Pierce, James, and Dewey, each believed that both the empirical and practical aspects should be considered when judging ideas to then decide the next best course of action (Johnson & Onwuegbuzie, 2004). Dewey (1915/1997) considered knowledge to be both the meaning structures consciously used to understand the current events and the act of bringing unconscious meaning structures into consciousness by reflecting on the connection between self and one’s environment in order to make sense of the uncertainty. Freire (1970/2018) described this as *praxis*, or the action and reflection of individuals on their environments with the purpose of transformation of those environments. Both Dewey (1915/1997) and Freire (1970/2018) emphasized that reflection and action are social practices, incorporating the diversity of individual experiences within the community upon which one’s prior knowledge is built. Through individual and collective praxis, researchers can surface unconscious meaning structures into consciousness, allowing assumptions to be discussed, tested, and, if necessary, changed. My goal with this research
was to provide empirical evidence of the impact of assessment activities on student success to better inform the dialogue. By doing so, I hope that faculty and administrators will continue to collaborate for the benefit of students.

**Conceptual Framework**

Assessment occurs at multiple levels within institutions of higher education, including at the assignment, course, academic program, co-curricular program, and institution or general education levels. This study specifically considered whether the implementation of assessment practices at the academic program level impacts institutional student success performance. There are many aspects that impact institutional performance as highlighted in the conceptual framework, including organizational culture, organizational learning, and the implementation of assessment best practices (see Figure 2).

**Figure 2**

*Conceptual Framework*
Organizational culture related to assessment practices includes both the culture of institutions and the culture of academic disciplines. An institution’s assessment culture is the deeply embedded, collectively held beliefs and values about institutional assessment practices. Each academic discipline has varying expectations and procedures that impact how faculty at most institutions operate and what they assess within that discipline. The assessment culture is heavily influenced by non-human aspects of an organization such as strategies, policies, and procedures. It also includes meaning structures, or the beliefs and assumptions individuals use to organize, make sense of, and give meaning to the information they collect. Faculty are motivated or not motivated to participate in assessment practices by these cultural aspects, including how they choose what gets assessed and how it is assessed.

The second impact on assessment practices is organizational learning. Organizational learning occurs at the individual, group, and organizational levels, with the organizational level often encompassing the non-human aspects mentioned above and becoming a part of the organizational culture. Schein (2017) described culture as accumulated shared learning. The organizational learning at all three levels impacts how assessment is carried out within an institution of higher education.

Assessment of student learning outcomes in higher education is centered on assuring that the course and academic program learning outcomes articulated by faculty are being met by students completing courses and graduating from that program. In so doing, the institutional members can be assured that the needs of students and of employers who will employ graduates are being met and that well-prepared individuals are graduating from the institution. In this study, implementation of assessment practices and organizational learning are hypothesized to be impacted by faculty motivation. Both organizational learning and the
implementation of assessment practices were hypothesized to positively impact institutional performance (see Figure 3).

**Figure 3**

*Hypothesized Model*

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**Assessment in Higher Education**

Assessment has been defined by higher education researchers as a framework for faculty attention (Allen, 2004), a process for collecting and discussing information (Huba & Freed, 2000), a method of identification of pedagogical tactics (Suskie, 2009), and a form of systematic inquiry (Gray, 2002). The common threads among these activities are that assessment is focused on strengthening student learning and development and faculty’s efforts to achieve student learning and development as articulated in learning outcomes (Allen, 2004; Gray, 2002; Huba & Freed, 2000; Suskie, 2009).

The current assessment focus at the academic program and institutional levels in U.S. higher education began in the mid-1980s and is often referred to as the “assessment movement” (Ewell, 2009). It grew out of practices used by faculty to assess student learning
in individual courses, efforts to compare learning across institutional general education programs, and to assess students’ preparedness for entering college via standardized testing programs (Baas et al., 2016). The history of assessment practices in U.S. higher education consistently focused on improving the educational program within institutions. That changed, however, with greater calls for public accountability amidst rising costs to the public.

**Context of Assessment in Higher Education**

The need for accountability measures across institutions multiplied during the assessment movement as the influence of externally interested parties increased. (Brown, 2017). Ewell (2009) identified four external entities that drive accountability activities in the United States: the states, the federal government, accrediting bodies, and the public consumers of higher education. Likewise, Brown (2017) cited three entities: the state, which he identified as local, state, and federal governments, with an emphasis on compliance to their laws; the profession with an emphasis on learning; and the market with an emphasis on performance. He then detailed seven fields of accountability in U.S. higher education, each with its own nomenclature, professional associations, and basis of literature, leading to confusion of key terms surrounding assessment and evaluation. Each of the fields also addresses one or more of Brown’s (2017) state/compliance, profession/learning, and market/performance logics as highlighted in Figure 4.

Within Brown’s (2017) map of accountability and as used in this study, assessment is focused on learning. Assessment is the process of systematically collecting, analyzing, and translating data on a given topic. He believed that accountability is a by-product of assessment for which the main objective is the improvement of teaching and learning. Accreditation combines the student learning and compliance emphases within the
accountability landscape (Brown, 2017). The purpose of accreditation is to provide an independent accountability structure to validate institutional programs and services to external stakeholders (Suskie, 2009).

**Tension between Assessment and Accreditation**

The economic difficulties of the 1970s in the United States increased employer desires for college-educated employees and, while state and federal governments increased subsidies for higher education programs, the costs of obtaining a bachelor's degree also increased rapidly (Ewell, 2009). The public subsidization of higher education by state and federal governments led to a stronger desire by the public for control and accountability of higher education institutions. Multiple states have incorporated various state funding models using timely degree completions as a primary metric (Ewell, 2009; Suskie, 2014).

Assessment activities can generate knowledge for stakeholders (Banta & Blaich, 2010) and allow institutions to publicly increase their perceived worth and quality (Wright, 2002). This desire of legislatures for compliance shifted the assessment conversation from one of internal improvement to external accountability where a tension between these assessment purposes continues (Baas et al., 2016; Banta, 2002; Ewell, 2009; Ikenberry & Kuh, 2015).

There are many views of the relationship between assessment and accreditation. Gray (2002) proposed that accrediting agencies should hold institutions accountable for having internal processes leading to continuously improving the teaching and learning process. Stitt-Bergh et al. (2019), however, advocated that external standards from accreditors are completely separate from the teaching and learning process in higher education. Simper et al. (2021) suggested that assessment for accountability undermines meaningful learning. Nationwide, assessment leaders in institutions of higher education believe that accreditation
is a key driver of assessment activities (Jankowski et al., 2018) and that institutional leaders can fulfill their accountability requirements through engaging in assessment for improvement (Y. Z. Hill & Stitt-Bergh, 2021).

Ewell (2009) identified four external entities that drive assessment for accountability: the states, the federal government, accrediting bodies, and the public consumers of higher education. State governments are the primary funders of education through direct subsidies to public institutions and student aid programs that support students attending both public and private institutions.

Institutions of higher education in the United States may be accredited by one or more accrediting bodies: institutional accreditation from national accreditors or specialized program accreditors that focus on specific programs within an institution such as the Council for the Accreditation of Educator Preparation (CAEP; Suskie, 2014). National accrediting bodies have a long history of working with institutions of higher education, but it has been in the recent past that they became concerned with assessment activities (Ewell, 2009). As the assessment movement took off in the late 1980s, accrediting bodies became concerned with institutions having clear student learning outcomes (Baas et al., 2016; Ewell, 2009). The initial assessment process focused on continuous improvement, mirroring corporate America’s interest in the Malcolm Baldridge National Quality Awards (Wright, 2002). Throughout the assessment movement, accrediting bodies have emphasized that their member institutions have a process of assessment on their campuses to identify key learning outcomes and to assure that institutions are using their data to make improvements to curriculum and pedagogical techniques (Ewell, 2009). For example, the Higher Learning Commission (HLC, 2020) requires member institutions to “demonstrate responsibility for the
quality of its educational programs, learning environments, and support services, and it evaluates their effectiveness for student learning through processes designed to promote continuous improvement.”

As Gray (2002) argued and assessment leaders supported (Jankowski et al., 2018), accreditation of academic programs and institutions continues to be a main driver of assessment activities in U.S. institutions of higher education. Baer (2017, p. 9) proffered that assessment is the “foundation for accountability and accreditation.” However, the term “assessment” and its seemingly synonymous terms are not clear to many in higher education.

**Levels of Assessment Within Institutions**

Assessment for improvement is centered on the ideal of student learning outcomes at the course, program, and institutional (general education) levels, allowing faculty to judge what students are achieving the stated learning outcomes and providing assurance to stakeholders that students are learning what is expected. Faculty are then able to make changes to courses and programs as necessary based on their assessment of student learning (Dorime-Williams et al., 2022; Gray, 2002; Huba & Freed, 2000; Suskie, 2009). Identifying a mismatch between the expected student learning outcomes and achieved student learning outcomes provides an opportunity for learning among the faculty in the programs (Dixon, 1994).

**Academic Program Assessment**

The assessment process includes four key elements: (a) articulating the intended learning outcomes; (b) selecting appropriate assessment measures; (c) developing curricula, teaching methods, and learning experiences leading to the stated outcomes; and (d) closing the loop by improving student learning using the assessment results (Huba & Freed, 2000;
Maki, 2010; Suskie, 2009, 2014). Often referred to as the “assessment loop,” these four elements should be applied at a variety of levels within the institution beginning with how students demonstrate and are assessed on individual assignments, within courses, through co-curricular activities, at the academic program level, and the institution’s general education program (Dorime-Williams et al., 2022; Huba & Freed, 2000). Regardless of the level of assessment, the process of implementing assessment for student learning is nearly identical as each application follows the same four steps (Huba & Freed, 2000).

**Articulating Learning Outcomes**

Effective learning outcomes encompass the promises an institution makes to prospective and current students, their families, those who will employ the institution’s graduates, and the public which helps to fund the institution (Banta, 2002; Huba & Freed, 2000; Suskie, 2014). Generally, student learning outcomes are articulated at the institutional and program levels with input from both internal and external stakeholders (Banta, 2002) and aligned with the institution’s mission, vision, and goals (Dorime-Williams et al., 2022; Maki, 2010). Elliott and Oliver (2016) showed that faculty professional development that was aligned to the institutional mission and purpose led to increases in student learning and instructor actions.

Huba and Freed (2000) argued that the formulation of learning outcomes is the basis for improving teaching activities. Schoepp (2019) found in a study of leading institutions throughout the world that the lack of effective course learning outcomes resulted in being unable to identify if quality teaching and learning was taking place. Effective learning outcomes create alignment between learning, activities, and assessment (Schoepp, 2019).
Identifying Assessment Measures

Assessment measures help the assessor to verify students are learning what was identified in the learning outcomes (Suskie, 2014). The assessment process should consider not only the outcomes of learning, but also the activities or methods through which those learning outcomes are brought to fruition (Banta, 2002). Depending upon the level of analysis, written assessment plans that are based on the articulated learning outcomes should produce credible evidence of the learning and demonstrate institutional effectiveness (Banta, 2002). This was exhibited by a curricular mapping project undertaken by a consortium of liberal arts institutions which strengthened the ability of those institutions to deliver a sound education (Babyak, 2021).

Developing Learning Experiences

Many authors identify faculty development as a primary tool for using assessment to improve. Banta and Blaich (2010) suggested that faculty lack information about creating quality learning conditions and experiences. Incorporating activities that build capacity of faculty and staff to implement assessment and findings into their lessons and programs will support student learning (Banta, 2002). Fisher et al. (2014) highlighted the need for implementation fidelity, or how well a program or lesson was delivered as planned. By including implementation data with assessment data in pedagogical research, researchers can assure that any learning found to have occurred was the result of the lessons planned (Fisher et al., 2014).

Closing the Loop

Assessment for improvement can only occur when institutions use evidence to implement and assess changes being made to the course, academic program, or teaching
(Banta & Blaich, 2010; Fulcher et al., 2014). A strong assessment program produces data that is actionable to continuously guide improvement of student-learning, teaching, academic programs, and services (Banta, 2002; Banta & Blaich, 2010). Using assessment results to benefit students would be a monumental shift for campus constituents as assessment can be used to increase equity, better understand an academic program, and to improve the entire learning system (Banta & Blaich, 2010; Stitt-Bergh et al., 2019). Accrediting bodies have begun to consider demonstrated student learning more frequently and continue to rely on assessment activities to document student learning (Garceau et al., 2015).

Based on assessment that is not resulting in curricular or pedagogical improvements, Horst and Ames (2013) argued that broad improvement of student learning is not happening. Banta et al. (2009) found that only 6% of 146 submitted samples of good assessment practice used assessment results for improvements to teaching, learning, and student service areas. Likewise, in an internal review, Fulcher and Bashkov (2012) found that, while the quality of their institution’s assessment processes had improved, evidence of improved student learning did not improve at the same rate. Researchers (Schoepp & Benson, 2016) conducted an internal study at their institution and found that while faculty were able to identify actions to close the assessment loop, respondents did not see results of those conclusions implemented into their programs. Their study suggested the lack of closing the loop activities was due to faculty’s lack of understanding how to implement those changes or seeing the impact of their assessment activities (Schoepp & Benson, 2016). Smith et al. (2015) suggested that the lack of closing the loop was due to a lack of consistent terms from accreditors, authors, and practitioners to describe “use of results.” They speculated that this may be the result of
focusing on the assessment measures and processes rather than the implications and changes resulting from assessment activities (Smith et al., 2015).

There is a significant body of literature that relates to how faculty, departments, and institutions use assessment to improve student learning (Elliott & Oliver, 2016; Guetterman & Mitchell, 2016; Hobbs et al., 2021; Schoepp & Benson, 2016; Simper et al., 2021). There is very little literature on why they do so (M. B. Fuller & Skidmore, 2014; Peterson & Vaughan, 2002). That very few efforts identify and implement changes as a result of assessment activities is a gap in the assessment for improvement efforts (Banta & Blaich, 2010; Dorime-Williams et al., 2022; Fulcher et al., 2017). Identifying opportunities and developing plans to improve teaching and program design should be a collaborative effort between subject area experts, assessment professionals, and pedagogical experts (Stitt-Bergh et al., 2019). To effectively close the assessment loop, the department could implement and complete an organizational learning cycle (Dixon, 1994), as identified in Figure 5 and described later in this chapter.
Organizational Culture

Organizational culture, according to Schein (2017), has a powerful effect on group behavior. Defined as the shared and accumulated learning of a group, it becomes a pattern or system of beliefs, values, and behavioral norms that are unconsciously embedded in the organization (Schein, 2017). In Dixon’s (1994) terms, organizational culture is the sum of the meaning structures held by the collective. Any group of individuals can have a culture and it is possible to have multiple cultures within a single organization (Schein, 2017). For example, in higher education, academic departments would be considered subcultures within an institution because they are highly influenced by the external cultures of their academic disciplines (Boyce, 2003). Simper et al. (2021) found highly similar assessment practices within disciplines across international institutions of higher education. Froman (1999)
pointed out that the institutional culture in higher education discourages a common view of institutional priorities because the culture is designed for individual behavior and rewards. Guardrails are established around teaching practices and content, research foci, and promotion and tenure processes based more on academic discipline expectations than institutional expectations.

Schein (2017) considered culture to be the accumulated shared learning of the group that is transmitted to new group members through formal and informal on-boarding processes. The shared learning may include the assumptions that provide meaning and stability to the group, how they respond to external opportunities or threats, and solutions the group has proven to be true through repeated experience (Schein, 2017).

While culture as an idea is abstract and difficult to articulate, Schein (2017) identified three layers of culture that are observable. The first and most easily observable layer of culture includes tangible artifacts. These are items within the culture that can be seen, heard, and felt. Formal documents such as charters, organizational charts, mission and vision statements, and policy and procedure manuals may be examples of such artifacts. Schein (2017) cautioned that while artifacts are easy to observe, deciphering meaning from them is often difficult as the meaning comes from things much more intrinsic to the group. Therefore, to fully understand artifacts, an observer must begin looking into the second layer of analysis.

The second layer of analysis in Schein’s (2017) structure of culture was espoused beliefs and values. The espoused values and beliefs describe how group members explain why they do what they do. The shared experiences of the group confirm the values, goals and ideals the group holds. While group members will be able to articulate, or espouse, their
conscious beliefs and values, the actions of group members may not always agree with those espoused values because there are deeper assumptions from which individuals are acting. The deeper assumptions are referred to as theories-in-use (Schein, 2017).

Schein’s (2017) third, and most difficult to decipher, layer of cultural structure was basic underlying assumptions. At some point in a group’s accumulated learning, hypotheses or meaning structures that were found to work again and again became assumed operating procedures or beliefs. Because they worked for so long, they are no longer part of the group’s consciousness, and they operate as reality. These deeply held assumptions, or meaning structures, are so ingrained into the culture that group members do not allow them to be debated or confronted, they are simply taken as the way things are within the culture. This third layer of embedded cultural structure developed from organizational learning, makes the culture difficult to change (Schein, 2017).

**Institutional Assessment Culture**

Cultures of assessment were defined by Lakos and Phipps (2004) as those environments focused externally on the success of the customer or client in which decisions are data-driven with facts and analysis. Banta (2002) defined assessment culture as the set of deeply held beliefs and values that have a normative impact on assessment efforts. Maki (2010) used the term “assessment culture” to describe a commitment to using assessment strategies and processes at both the program and institutional levels to improve student learning. She identified six concepts of assessment cultures:

- shared institutional commitment
- clear conceptual framework for assessment
- cross-institutional responsibility
• transparency of findings
• connection to change-making processes
• recognition of leadership or involvement in assessment (Maki, 2010)

Taken together, a culture of assessment is a system of deeply embedded, collectively held beliefs and values about institutional assessment practices that support student learning outcomes (M. B. Fuller et al., 2016; Lakos & Phipps, 2004; Maki, 2010; Walker, 2020; Weiner, 2009).

Multiple authors have written about and attempted to identify factors distinguishing cultures of assessment at a variety of institutions. The identified factors important to creating cultures of assessment in higher education institutions can be grouped into the following four areas: shared purpose and vision; use and sharing of data; leader involvement; and faculty involvement.

**Shared Purpose and Vision**

Effective assessment must have a shared purpose and vision at the institutional level. Kezar (2013) found that internal purposes were the most significant factor in choosing to implement assessment practices. The common values of the institution as espoused in the institutional values and mission should permeate all other factors of assessment cultures (Maki, 2010; Ndoye & Parker, 2010). A shared vision includes having a common understanding and definition of key terms (Brown, 2017; Kezar, 2013; Weiner, 2009) so that everyone is speaking the same language throughout the process. A shared vision also includes the ultimate purpose of assessment activities to implement changes for improvement of the academic programs (Banta & Blaich, 2010; Dorime-Williams et al., 2022; Fulcher et al., 2017; Smith et al., 2015). Another aspect of the shared purpose of assessment is to have
an assessment plan. The plan allows all members of the institution to know how to implement assessment consistently over time (Weiner, 2009) and to use best practices (Walker, 2020).

**Use and Sharing of Data**

Assessment relies on using verifiable data to drive decisions on teaching and curricular improvements (Huba & Freed, 2000). Making the student, course, and institutional data available widely allows individuals across the institution to make data-informed decisions (Ndoye & Parker, 2010). Additionally, campus leaders regularly use written communication and speeches to share assessment data (M. B. Fuller et al., 2016). The broad availability and promotion of data on campus stimulate dialogue throughout the institution about successful and unsuccessful teaching and learning experiences (Maki, 2010; Stanny & Bryan, 2021; Weiner, 2009). These discussions are the core of assessment efforts and lead to institutional learning (Ndoye & Parker, 2010; Stevenson et al., 2017; Weiner, 2009).

**Leader Involvement**

Research has identified many ways that institutional leaders can support assessment activities at their institutions. Aside from communicating the importance and value of assessment, leaders can also establish policies and support structures that guide assessment practices across the institution (Maki, 2010; Ndoye & Parker, 2010) and by providing professional development to increase faculty competence in assessing their courses and programs (Elliott & Oliver, 2016; Ndoye & Parker, 2010; Weiner, 2009). Leaders can support assessment by providing sufficient technological solutions to help with data collection, dissemination, and analysis (Kezar, 2013). Governing boards can support assessment by assuring that human, financial, and technological resources are available to
support assessment activities (Maki, 2010; Walker, 2020). Lack of resources has been shown to hamper assessment activities (J. S. Hill, 2005; Kezar, 2013; Ndoye & Parker, 2010).

**Faculty Involvement**

Faculty are the linchpin to effective assessment programs (Baas et al., 2016; Banta, 2002; M. B. Fuller, 2013; Ndoye & Parker, 2010; Weiner, 2009). Huba and Freed (2000) argued that the institution succeeds and external audiences are assured when faculty take leadership in evaluating student learning. However, Baas et al. (2016) identified various reasons why some faculty have resisted the assessment movement. Among those reasons is the lack of evidence that the assessment movement has resulted in any meaningful change in higher education (Baas et al., 2016) and that faculty do not see the assessment process as a primary responsibility (Banta & Blaich, 2010).

Faculty generally have control of the educational program through faculty governance and curriculum implementation. Their ownership of assessing student learning is key if assessment is going to happen and be sustained at the institution (M. B. Fuller et al., 2016; Kezar, 2013; Ndoye & Parker, 2010; Weiner, 2009). Faculty responsibilities include identifying student learning outcomes at both the course and program levels which become the basis of assessment for student learning (Ndoye & Parker, 2010; Weiner, 2009). Because the faculty control the pedagogy and instructional design, they become the best liaisons between the classroom and institutional research (Maki, 2010; Walker, 2020). However, some faculty members do not connect classroom level assessment to broader academic outcomes such as preparing students for post-graduation lives (Dunn et al., 2020). Faculty are the best personnel to complete comprehensive program reviews through their intellectual curiosity about the efficacy of their classroom practices (Maki, 2010; Weiner, 2009).
Faculty Motivation for Assessment

Since the beginning of the assessment movement, faculty involvement has consistently garnered attention (Hutchings, 2010). Chief academic officers have consistently reported that greater involvement of faculty in the assessment process is what will help an institution’s assessment program be successful (Hutchings, 2010; Jankowski et al., 2018). However, researchers consistently find faculty who do and do not support assessment efforts.

For and Against Assessment

Baas et al. (2016) argued that faculty are key to successful assessment efforts as they translate the assessment done in the classroom to the academic program level. The researchers found two groups of faculty: those who support assessment and those who do not. Faculty they categorized as anti-assessment were found to be hostile toward their institutions’ assessment efforts, describing it as a burden being forced upon faculty by external entities, a futile exercise of trying to quantify the teacher-learner dynamic, and antithetical with the student development mission of higher education because assessment is focused on only the classroom experience rather than the entire student experience (Baas et al., 2016).

On the flip side of Baas et al.’s (2016) coin are the assessment advocates. This group of faculty believed that assessment is the main purview of faculty and should be managed by institutional leaders to help all employees with their work of developing students. This is done through identifying the effectiveness of all educational activities, both curricular and co-curricular. A strong assessment program also provides space for faculty to create stronger student learning outcome statements. Faculty with administrative roles were more likely to be a member of the assessment advocates group. Based on the two groups of faculty found in
their study, Baas et al. (2016) concluded that helping resistant faculty to see the evidence that assessment supports holistic student development will increase the likelihood that they will also support assessment practices.

**Typologies of Faculty Motivation**

Skidmore et al. (2018) identified four typologies of motivation held by faculty members in reference to their participation in assessment activities. These typologies were the cultures of fear, compliance, evolving student learning, and student learning. The research team did not examine further implications of the typologies on the institution or academic program implementation of assessment activities (Skidmore et al., 2018). These typologies of motivation may impact a faculty member’s motivation to participate in assessment activities.

The first and largest group of faculty were typified by Skidmore et al. (2018) by student learning. This group had a strong agreement with the purpose of assessment for improving student learning and low agreement with any questions on the survey regarding negative responses to assessment such as fear or punishment. Those identified with the typology of evolving student learning were similar to the first group but differed in that they were not as repelled by the survey statements related to compliance purposes of assessment or participating in assessment out of fear or punishment. Faculty in the culture of compliance and culture of fear typologies had the lowest agreement on statements of assessment activities related to student learning. The compliance typology had the highest agreement with statements of assessment purposes related to accreditation while faculty identified with the typology of fear had the highest agreement with statements related to fear of negative repercussions for not participating in the assessment activities. Understanding how faculty as
individuals and grouped as academic units overseeing academic programs perceive assessment activities helps leaders create dialogue about the importance of assessment to the academic program (Skidmore et al., 2018), supporting Baas et al.’s (2016) conclusion that providing evidence that assessment supports holistic student development will be a motivator to faculty to support assessment activities.

**Self-Determination Theory**

Several authors have used the self-determination theory (SDT; Deci & Ryan, 2000a) to consider faculty motivations for their various roles, including teaching (Stupnisky et al., 2018; van den Berg et al., 2013), research (Stupnisky et al., 2019), and assessment (Dunn et al., 2020). Dunn et al. (2020) identified that assessment is most likely not an intrinsically motivated activity for faculty members for reasons such as competency and self-determination to manage their classrooms as they see best. Additionally, many faculty members do not connect classroom level assessment to broader academic outcomes such as preparing students for lives after earning their degree (Dunn et al., 2020).

Self-determination theory begins with the premise that humans are active, growth-oriented beings with a propensity toward incorporating a set of psychological needs into a coherent self-identification (Deci & Ryan, 1985, 2000a). Individuals for whom the psychological needs of autonomy, competence, and relatedness are met tend to have higher quality behavior and greater psychological health than those for whom the psychological needs are not met (Deci & Ryan, 2000a). Self-determination theory focuses on the individual’s reaction to a phenomenon rather than the phenomenon acting upon the individual, understanding that different individuals respond differently to the same event. Intrinsically motivated individuals are more likely to take initiative in their learning and
development because they find the activity enjoyable and exciting. Those who are extrinsically motivated will rely on external influences such as pay structures and job requirements to drive their behavior and knowledge acquisition (Deci & Ryan, 1985; R. M. Ryan & Deci, 2000). Figure 6 shows the Taxonomy of Motivation that highlights the motivations, regulatory styles, and perceived locus of causality.

Figure 6

Self-Determination Theory's Taxonomy of Motivation

<table>
<thead>
<tr>
<th>Motivation</th>
<th>Amotivation</th>
<th>Extrinsic Motivation</th>
<th>Intrinsic Motivation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulatory Style</td>
<td>External Regulation</td>
<td>Introjected Regulation</td>
<td>Identified</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Regulation</td>
</tr>
<tr>
<td>Perceived Locus of Causality</td>
<td>Impersonal</td>
<td>External</td>
<td>Somewhat Internal</td>
</tr>
</tbody>
</table>


According to Ryan and Deci (2020), the self-determination theory identifies four regulatory styles of extrinsic motivation. The first is external regulation and is characterized by rewards and punishments imposed by others. When externally regulated, individuals typically feel controlled by others through rewards or punishments for carrying out the activities. With introjected regulation, the perceived causality begins to be internalized although one still feels controlled by causes external to themselves. They choose to complete
the tasks out of an internal obligation that they should do them. By demonstrating correct or expected behaviors, individuals maintain a positive self-esteem and avoid feelings of shame or guilt. Identified regulation describes when an individual autonomously enacts the expected behavior because they identify with or endorse the activity. This agreement causes one to voluntarily carry out the activity as they perceive some internal causality. The fourth and most autonomous type of regulation for extrinsic motivation is integrated regulation. Integrated regulation describes individuals who find the activity or expectation to be congruent with their values or beliefs and therefore willingly participate in the activity although they do not participate in the activity out of pure enjoyment, there is still an external force driving their participation. Table 1 identifies the similarities between the types of regulation for extrinsic motivation identified in the self-determination theory and the typologies of faculty motivations identified by Skidmore et al. (2018).
### Table 1

*Comparison of Typologies of Motivation & Types of Regulation for Extrinsic Motivation*

<table>
<thead>
<tr>
<th>Typologies of Motivation (Skidmore et al., 2018)</th>
<th>Types of Regulation for Extrinsic Motivation (Deci &amp; Ryan, 2000b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fear Motivation – Will only do assessment because they are required to do so by administration or external organizations</td>
<td>External Regulation – individual’s behaviors are controlled by specific external positive or negative consequences administered by others</td>
</tr>
<tr>
<td>Compliance Motivation – Not afraid of assessment although would not do it if not required; ambivalent toward assessment for student learning</td>
<td>Introjected Regulation – individual has accepted external regulations and acts from their desire to avoid feelings of guilt or shame</td>
</tr>
<tr>
<td>Evolving Student Learning – Attempting to resolve accountability and accreditation goals of assessment with student learning goals</td>
<td>Identified Regulation – individuals have recognized and accepted the value of a behavior and will voluntarily act in alignment with the external expectation</td>
</tr>
<tr>
<td>Student Learning Motivation - View assessment as a method to improve student learning</td>
<td>Intrinsic Regulation – individuals’ behavior arises from activities that allow for satisfaction of human needs for autonomy, competence, and relatedness</td>
</tr>
</tbody>
</table>

### Organizational Learning

Organizational learning theory can help practitioners understand a wide range of organizational phenomena, specifically how organizational members create and use new knowledge (Dee & Leišytė, 2016). Organizational learning can be defined as the “intentional use of learning processes at the individual, group, and system level to continuously transform the organization in a direction that is increasingly satisfying” (Dixon, 1994, p. 5) and results in changes to the knowledge, beliefs, or behaviors of the organization (Watkins & Marsick, 1993). As defined, organizational learning incorporates multiple levels of the organization. Argyris and Schon (1978) stipulated that organizational learning cannot occur without individual learning, yet individual learning is insufficient in and of itself for organizational
learning. Organizational learning within the context of this study begins with the individual learning of faculty and continues to the group or academic program and onto the institution. This is supported by many researchers who identify faculty as the linchpin of the assessment process (Baas et al., 2016; Banta, 2002; M. B. Fuller, 2013; Ndoye & Parker, 2010; Weiner, 2009).

Learning is the process of constructing and reconstructing meaning structures (Dixon, 1994). It begins with a problem, identified as a mismatch between the expected outcomes and the actual outcomes (Argyris, 1994; Dixon, 1994). Watkins and Marsik (1993) described the stimulus as an error or an unexpected jolt that ignites learning. In assessment, the impetus may be a difference between the expected student learning outcomes and the student learning achieved. Organizational learning is a continuous transformation without an identified end state because each solution begets a new problem. The constant state of learning should result in change. Effective organizations have a systematic process to facilitate incorporation of the new learning into their organization. Ineffective organizations lose or miss the opportunities that new learning affords. Organizational learning is therefore a process of continuous transformation that begins with individuals and extends to organizations (Argyris & Schon, 1978; Dixon, 1994). Without the individual learning extending to the group level, organizational learning does not occur (Dee & Leišytė, 2016).

Organizational Learning Paradigms

Dee and Leišytė (2016) identified at least three paradigms of organizational learning: functional, interpretive, and emancipatory. In the functionalist paradigm, the most common perspective among researchers, organizational learning is viewed as an intentional process with the outcome of obtaining knowledge. In this paradigm, learning can be used as a
management tool to increase efficiency and effectiveness of the organization. Individual learning is accomplished by individuals in the organization and stored at the organizational level through systems and procedures. The next paradigm is an interpretive or social construction perspective that considers learning as a social practice of constructing knowledge in a specific context. Finally, a growing paradigm is the emancipatory perspective. In this paradigm, learning is an opportunity to enhance one’s personal agency and to provoke action challenging the organizational strategy (Dee & Leišytė, 2016). Two of the most commonly used functionalists paradigms are Senge’s (2006) five factors of learning organizations and Argyris and Schon’s (1978) double-loop learning. The 4i Framework proposed by Crossan et al. (1999) is an example of an interpretive paradigm.

**Senge’s Five Disciplines**

Senge (2006) identified five disciplines of a learning organization. Those disciplines are systems thinking, personal mastery, mental models, building a shared vision, and team learning. In systems thinking, patterns of change are identified and examined. These patterns may include reinforcing feedback that may speed up growth as the system evolves, balancing processes that seek stability or homeostasis in the system, and delays between actions and consequences. A learning organization must be comprised of individual learners as organizations and the structures within are made up of and influenced by people. Senge uses the term “personal mastery” to connotate the learning and growth of those individuals as they align a personal vision of a desired future state and a clear picture of their current reality. The difference between these two states creates creative tension that drives future learning as individuals seek to resolve that tension that pulls one simultaneously both toward and away from the vision (Senge, 2006).
The third discipline of Senge’s (2006) learning organization is mental models. Mental models, or deeply held beliefs, shape our actions because individuals tend to selectively observe data that is congruent with what they believe. To effectively deal with mental models, organizational members should surface, test, and improve their mental models of how the world functions. Senge suggested the skills of reflection, slowing down thinking to increase awareness of how we think, and the skills of inquiry, how individuals directly deal with complex or conflicting situations, to help surface and test mental models. By exposing the mental models at work in a situation, an organization or group can expose hidden assumptions and change or eliminate them to uncover true problems preventing progress (Senge, 2006).

Senge (2006) suggested that shared vision, the fourth discipline, is a force that derives its power from a group of people caring about a common target. The shared vision will likely create tension as the organization drives toward it. The final discipline of learning organizations is team learning. Team learning is the process of getting all members of the team to align efforts and abilities toward a shared vision. Being able to manage dialogue is perhaps the most important skill to facilitate team learning. In dialogue, the focus is on the complex issue while it is held in front of the team rather than within the individuals. By encouraging dialogue, members observe and discuss their thinking and realize that their thinking is creating conflicts rather than the individuals’ thoughts. Dialogue gets beyond the defensiveness that many people feel in conflict and allows the issues and structures to be examined (Senge, 2006).
Double-loop Learning

Argyris and Schon (1978) believed that learning often results in behavioral or cognitive change. Outcomes arise from actions or behaviors which are influenced by the meaning structures one holds (see Figure 7). Learning that proceeds from the identified mismatch between intended and realized outcomes can be addressed by single- or double-loop learning. Single-loop learning results in changes to the behaviors or actions of the organization. It is based on the belief that the organization is performing the behaviors or actions poorly. Implementing single-loop learning often results in incremental changes to the organization. Double-loop learning can result in transformational change because it involves critically examining the meaning structures behind the actions that come from cultural norms and structures. Double-loop learning is based on the belief that the organization is performing the wrong behaviors and actions (Argyris & Schon, 1978). Research on organizational learning has consistently displayed a bias toward transformational change, downplaying the importance of incremental change (Dee & Leišytė, 2016).

Figure 7

Single-loop and Double-loop Learning

Note. Adapted from Argyris & Schon (1978)
In student-centered learning, the emphasis of the activity is on the process of learning that the student undertakes (Huba & Freed, 2000). However, in most institutions of higher education, the curriculum is centered on the teaching of the content rather than the learning. Efforts to update the curriculum are more often about changing what is taught to improve poor student success, often with limited results. Changing the content that is taught is an example of single-loop learning. The actions may result in some immediate success without the meaning structure, teacher-centered learning, changing. However, if the actions began with changing from teacher-centered classrooms emphasizing content delivery, to learner-centered classrooms that emphasize guiding students in their understanding of the content, the results would likely be more gradual improvements in student success that increase over the long-run. Changes to the meaning structure is an example of double-loop learning (Huba & Freed, 2000; Tagg, 2007).

**The 4i Framework**

Developed by Crossan et al. (1999), the 4i Framework focused on strategic renewal which they considered to blend homeostasis and change at the organizational level. They have been one of the few organizational learning researchers to specifically consider the links between individual, group, and organizational levels in the process of change. Bontis et al. (2002) characterized the individual, group, and institutional levels of learning as “stocks” because those entities tend to hold the learning within the entity. The flows of learning, or the processes that carry the learning across the stocks, occur through four processes: intuiting, interpreting, integrating, and institutionalizing (Bontis et al., 2002). Crossan et al. (1999) posited that the processes create feed-forward and feedback flows from the individual, through the group, and the institution, and back as identified in Figure 8.
The feed forward flow of learning begins with the seed of an idea or insight from a preconscious recognition of a pattern in an individual’s experience (Crossan et al., 1999). As the individual ruminates on their insight and it begins to take shape, they begin the process of interpreting the insight. Interpretation continues as the individual attempts to describe that experience through words, developing language to describe the experience to themselves and others. This begins the transition of learning from the individual to the group. Within the group context, individuals can participate in dialogue around the idea to come to a shared understanding and develop informal coordinated actions that integrate the new knowledge within the group and possibly the institution as well, thus changing the group and likely beginning to create change in the institution. Finally, as the coordinated actions become well-tested and decisions are made to replicate the actions broadly across the institution, they are institutionalized through systems, policies, structures, and strategies. The feed forward process from the individual to the organization is one of exploration and assimilating new ideas and possibilities. The feedback process goes the opposite direction and allows groups and individuals to exploit what has already been learned by the institution (Crossan et al., 1999).
Organizational Learning Cycle

Argyris and Schon (1978) believed that, because organizations are comprised of individuals, organizational learning begins with individual learning. The meaning structures held by individuals are then classified as private, accessible, or collective (Dixon, 1994). Meaning structures classified as private are held by individuals and are not open to others to access whereas collective meaning structures are those held by the group. Accessible meaning structures are those that are held by an individual but are open to be considered by
others in the collective. It is through the accessible meaning structures that organizational
learning can occur. By collectively considering the accessible meaning structures through
dialogue within the group, new meaning structures are created that may or may not move into
the collective. Collective meaning structures may represent organizational norms,
expectations on how work is done (often codified into policies and procedures), or strategies
(Dixon, 1994) which all become part of the organizational culture as identified by Schein
(2017).

Organizational learning occurs when individual meaning structures create dissonance
with either other members’ meaning structures or the collectively held meaning structures
(Dixon, 1994). Often, the collective meaning structures have been so ingrained into the
organization’s methods of operating that they are simply accepted aspects of the organization
because of years of experience that support the meaning structure. At this point, the meaning
structures become part of the organizational culture (Dixon, 1994; Schein, 2017).

Dixon (1994) identified a cycle of learning within the organization similar to Kolb’s
the widespread generation of information. New information comes from experiments,
research on one’s craft, or formative data and post-mortem summations. Once the new
information is collected, the second step is to integrate the new information into the
collective. To do so effectively requires all members of the group to be working from the
same information and what others know. Having a strong understanding of the large picture
of the group and larger organization is critical to integrating the new information. By having
the full picture, the group can advance to the third step of collectively interpreting the data.
This is done through open dialogue. Simply providing information to others does not lead to
learning nor does receiving information equate to making meaning of the information (Dixon, 1994). Groups will gain a deeper understanding when the members participate in a process of questioning, reflecting, and getting and giving feedback to others (Watkins & Marsick, 1993). Organizational learning requires each member to participate in this dialogical process with other members of the organization, making each members’ individual meaning structures explicit (Dixon, 1994; Watkins & Marsick, 1993). Integrating the new information into existing meaning structures or changing the collectively held meaning structures to accommodate the new data is where learning occurs (Dixon, 1994; Watkins & Marsick, 1993). Action results in change only when the new knowledge acquired through this process is shared, implemented, and incorporated into the organization’s routines and systems (Watkins & Marsick, 1993). Finally, with the collectively interpreted data, individuals should have the authority to take action on behalf of the group. Without action, the potential for learning will be lost (Dixon, 1994). The organizational learning cycle complements the assessment loop as identified in Figure 5.

Organizational Learning in Higher Education

Senge (2000) suggested that institutions of higher education have become the foremost “knowing institutions,” or repositories for knowledge, in a world increasingly favoring “learning organizations,” or institutions that are continuously creating and assimilating new knowledge into their cultures to bring about change. He concluded that institutions must shift from an industrial age mindset that is focused on teaching to a mindset of discovery and learning (Senge, 2000).

Many authors have suggested opportunities for institutions to incorporate organizational learning. Martin et al. (2001) argued that self-studies completed for
accreditation purposes invite the opportunity for organizational learning. A self-study process is full of opportunities for collaborative learning and creating new patterns of behavior around a shared vision (Martin et al., 2001). Ewell (1997) suggested that student learning outcomes assessment is designed to stimulate organizational learning.

The difficulty to implementing organizational learning practices in higher education stems from the culture of higher education broadly. Faculty were suspicious of the close proximity of organizational learning principles to the corporate world and did not believe those principles were applicable to higher education (Senge, 2000). However, Holyoke et al. (2012) found that while faculty responded positively to organizational learning factors, they did not implement them in their academic departments. Multiple authors (Boyce, 2003; Dee & Leišytė, 2016; Ewell, 1997; Holyoke et al., 2012) suggested the autonomous and individualistic culture of work in institutions of higher education acted against the practice of dialogue required for collaborative learning. Individual and group incentives to incorporate organizational learning for faculty such as promotion and tenure policies and the reputation for academic units are rarely recognized (Dee & Leišytė, 2016; Ewell, 1997).

Boyce (2003) argued that organizational learning is required to sustain institutional change in higher education. Challenging the assumptions and patterns of behavior through open dialogue with colleagues, students, and administrators within academic units and across the institution can lead to improvements in teaching practices and curriculum (Banta & Palomba, 2015; Boyce, 2003; Holyoke et al., 2012). Because faculty are the heart of the higher education value creation process, embedding change to institutional structures, systems, and cultures rely heavily on this group (Boyce, 2003; Senge, 2000).
Measurements of Organizational Learning

Several research teams have attempted to quantify organizational learning. Watkins and Marsick approached organizational learning from the functionalist paradigm relying on Senge’s (2006) and Argyris and Schon’s (1978) writings to develop the Dimensions of the Learning Organization Questionnaire (DLOQ, Marsick & Watkins, 2003; Yang et al., 2004). The DLOQ purports to measure seven factors of a learning organization and two key results. While the dimensions of the DLOQ have been validated in several languages and many types of organizations (Watkins & Kim, 2018), including higher education (Ponnuswamy & Manohar, 2016), concerns have been expressed. Kim et al. (2015) found insufficient evidence to verify that the DLOQ measures the seven dimensions of organizational learning. However, they did suggest that without additional evidence to the support the multi-dimensional measurement, the DLOQ could be used to measure respondents’ perceptions of organizational learning as an overarching construct (Kim et al., 2015).

Chen approached organizational learning from a social constructivist paradigm to develop a survey used in university libraries in Taiwan (Chen, 2006) and the United States (Evener, 2019). Based on Crossan et al.’s (1999) 4i framework, their survey was used to collect staff perceptions and the methods by which changes were identified and implemented in their library systems (Chen, 2006; Evener, 2019). The researchers identified libraries as having a high, medium, or low organizational learning capacity based on constructs of single- or double-loop learning, progression of ideas from individuals to the group, and identification and implementation of new practices based on evaluations (Chen, 2006).

Bontis et al. (2002) also used the 4i framework to develop the Strategic Learning Assessment Map (SLAM) that was used in this study. It focused on the three learning stocks
and two flows of learning. The SLAM instrument was used by Bantis et al. (2002) to assess the perceptions of individuals in mutual fund companies of their organizations’ stock and flows of learning and related them to the employees’ perceptions of their organization’s financial performance. The instrument included 60 questions, ten on each of the three stocks and two flows, and ten on respondents’ perceptions of their organization’s performance. (Bontis et al., 2002).

Bontis et al. (2002) concluded that organizational-level learning is more closely related to organizational performance than individual- or group-level learning. Multiple research teams (Bontis et al., 2002; Real et al., 2006, 2014) have found the five measures of organizational learning as assessed by the SLAM instrument to be reliable and valid across multiple groups and found discriminant validity among the dimensions. Additionally, Real et al. (2006, 2014) found construct validity of the second order factor of organizational learning from the five measures.

**Institutional Performance**

Many studies of organizational learning have found a positive relationship between organizational learning and organizational performance (Bontis et al., 2002; Habtoor et al., 2020; Kumar & Idris, 2006; Ponnuswamy & Manohar, 2016; Real et al., 2006, 2014; Yang et al., 2004). Each defined organizational performance using different metrics perceived by the respondents: financial performance (Bontis et al., 2002; Real et al., 2006, 2014; Yang et al., 2004); knowledge transfer (Habtoor et al., 2020; Kumar & Idris, 2006; Ponnuswamy & Manohar, 2016); strategy adoption (Habtoor et al., 2020); and research (Ponnuswamy & Manohar, 2016). Yang et al. (2004) found a moderate fit in their model between Marsick and Watkins’ (2003) organizational learning measurement model and self-reported financial and
knowledge performance of for-profit organizations. Ponnuswamy and Manohar (2016) found that knowledge performance perception in Indian higher education institutions was significantly and positively enhanced by organizational learning constructs, thus supporting Yang et al.’s (2004) model in a higher education setting. The key element seems to be that organizational learning leads to improved organizational performance that results in a competitive advantage (Habtoor et al., 2020; March, 1991).

**Student Success Outcomes**

No empirical evidence was found attempting to connect organizational learning to student success measures even though multiple authors suggested that organizational learning contributes to stronger teaching and learning (Holyoke et al., 2012; Ponnuswamy & Manohar, 2016). While there is a significant body of research referred to as the scholarship of teaching and learning, or SOTL, that includes assignment and course-level assessment techniques and the resulting progression of students at the course-level, the focus of this study is at the academic program level assessment. Student success markers abound in higher education and involve multiple levels of analysis, including course success, curriculum progression, co-curricular engagement, and post-graduation factors (Eubanks, 2021). The federal government defines student achievement as a combination of student learning, course and degree completion, and job placement (Bailey & Belfield, 2019; Suskie, 2014). Therefore, two primary markers for student success commonly found in the literature are retention and graduation rates (Millea et al., 2018; J. F. Ryan, 2004). A third metric for student outcomes that has been used are faculty perceptions of student outcomes (Cameron, 1978, 1981; Ewell, 1989)
Retention Rates

Retention is defined by Integrated Postsecondary Education Data System (IPEDS; U.S. Department of Education, National Center for Education Statistics, 2022) as the percentage of first-time, full-time degree or certificate-seeking undergraduate students from an entering fall cohort who are enrolled in the same institution the following fall. Many researchers have used this definition in their studies because the metric is easily available from the IPEDS database (Millea et al., 2018; J. F. Ryan, 2004). This measure has led to a strong understanding of student departure from an institution of higher education (Tinto & Pusser, 2006). However, retention is often confused or used interchangeably with persistence.

A broader term, student persistence, focuses on the year-to-year continuous enrollment of students through graduation. While Tinto and Pusser (2006) argued that student persistence reflects institutional practices, they also acknowledged that persistence is difficult to measure because students do not enroll continuously at a single institution or in any institution. Such actions make it difficult to determine the overall influence of institutional practice and policy on the persistence of students (Tinto & Pusser, 2006). Neither retention nor persistence rates accurately measure student learning or course completion. Students must be retained and persist in higher education, although not at a single institution, to achieve a degree.

Graduation Rates

Graduation rates are the percentages of those first-time, full-time cohorts who graduate in one-hundred-fifty percent of the expected time (IPEDS, 2022). For bachelor’s
degree programs, this is defined by IPEDS as a six-year period although they can also be measured at the four-year or eight-year points.

Tinto (2012) was more nuanced differentiating between graduation rates and completion rates. Because graduation rates are defined by IPEDS criteria, they do not always include students who take longer than six years to complete a bachelor’s degree. Some students may take longer than eight years due to financial difficulties or family responsibilities that do not allow them to regularly attend class or complete 30 semester hours per academic year, considered full-time enrollment in the traditional fall and spring semesters. An institution’s completion rate is not tracked through the IPEDS (2022) annual data collection and may have varying definitions; therefore it is not a useful data point to consider in a research study involving multiple institutions, leaving the retention or graduation rates as defined by IPEDS as the better estimates of student degree achievement (Tinto, 2012).

Brown (2017) argued that graduation rates are not a sufficient marker of a learning-focused variable. He identified an ongoing challenge for higher education leaders to identify a better variable that can connect the needs of the market, accountability, and learning. In the absence of a more consistent metric to identify institutional outcomes, Brown (2017) acknowledged that graduation rates became the default option when comparing multiple institutions. Finally, Bailey (2006) suggested that student success at an institution should be based primarily on longitudinal data rather than point in time data to provide a better view of the institution as a whole. Legislators expect institutional leaders to demonstrate institutional effectiveness in terms of student learning, course and academic program completion, and job placement (Bailey & Belfield, 2019; Suskie, 2014). Hess et al. (2009) found that institutional
practices were important in who completed a college degree, although they did not delineate specific practices that were impactful.

**Perceptions of Student Outcomes**

Cameron (1978) identified nine dimensions of organizational effectiveness in higher education institutions, listed and defined in Table 2. This study used the perceptions of faculty and administrators from colleges and universities. Cameron (1981) found that institutions who focus on specific domains of effectiveness will become less effective in the other domains. This supported his research results that each organization has multiple effectiveness domains and that the construct of organizational effectiveness is multi-dimensional (Cameron, 1981).

The construct of organizational effectiveness has been used to study both two- and four-year institutions throughout the United States (Cameron, 1986; Ewell, 1989; Krakower & Niwa, 1985; Smart, 2003) as well as other countries (Al Shraah et al., 2023; Kwan & Walker, 2003; Lejeune & Vas, 2009). At two-year institutions, Smart (2003) identified that improvements in performance were tied to the development of campus cultures. Kwan and Walker (2003) found that the faculty and administrator-focused dimensions of organizational effectiveness were more important than the student-focused domains and speculated this was due to the research-focused funding model for higher education in Hong Kong. Similarly, Lejeune and Vas (2009) found in the Belgian institution that specialized program accreditation activities influenced organizational culture through the perception of their institution rather than on student outcomes.


### Table 2

*Dimensions of Organizational Effectiveness in Higher Education*

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student educational satisfaction</td>
<td>The degree of satisfaction of students with their educational experiences at the institution.</td>
</tr>
<tr>
<td>Student academic development</td>
<td>The extent of academic attainment, growth, and progress of students at the institution.</td>
</tr>
<tr>
<td>Student career development</td>
<td>The extent of occupational development of students, and the emphasis on career development and the opportunities for career development provided by the institution.</td>
</tr>
<tr>
<td>Student personal development</td>
<td>Student development in non-academic, noncareer oriented areas, e.g., socially, emotionally, or culturally, and the emphasis on personal development and opportunities provided by the institutional for personal development.</td>
</tr>
<tr>
<td>Faculty and administrator employment satisfaction</td>
<td>The satisfaction of faculty members and administrators with jobs and employment at the institution.</td>
</tr>
<tr>
<td>Professional development and quality of the faculty</td>
<td>The extent of professional attainment and development of the faculty, and the amount of stimulation toward professional development provided by the institution.</td>
</tr>
<tr>
<td>Systems openness and community interaction</td>
<td>The emphasis placed on interaction with, adaptation to, and service in the external environment.</td>
</tr>
<tr>
<td>Ability to acquire resources</td>
<td>The ability of the institution to acquire resources from the external environment, such as good students and faculty, financial support, etc.</td>
</tr>
<tr>
<td>Organizational health</td>
<td>Indicative of the benevolence, vitality, and viability in the internal processes and practices at the institution.</td>
</tr>
</tbody>
</table>

https://doi.org/10.2307/2392582*

Ewell (1989) considered faculty perceptions of student satisfaction, student academic achievement, student career development, and student personal development to ascertain undergraduate education outcomes of students at a multitude of institutions. These four
constructs related to student success were used in the 183-question Assessment of the Performance of Colleges and Universities (APCU) developed by the National Center for Higher Education Management Systems (Ewell, 1989). Ewell (1989) used a subset of questions from the APCU to examine the impact of institutional culture on perceptions of effectiveness. In comparing faculty perceptions, he found that there were minor variances by type of institution (public vs. private) or selectivity (open enrollment vs. selective). The greatest difference in faculty perceptions among institutions were due to cultural or organizational functioning such as the mission of the institution and how consistently leaders articulate that mission to institutional members and external constituents (Ewell, 1989).

Summary and Implications of Literature Review

The continued confidence of the public in U.S. higher education will rely on institutions demonstrating with evidence that course and program learning outcomes are being met, leading to improved student learning and increased employment of their graduates (Ikenberry & Kuh, 2015; Suskie, 2014). While researchers (Elliott, 2018; Fulcher et al., 2014; Tinto, 2012) have posited that assessment programs lead to greater student success, empirical evidence to support that claim has not been found. Faculty continue to search for evidence that assessment activities result in meaningful change at their institutions (Baas et al., 2016).

The key of assessment is the social learning process of reflection and action (Dewey, 1915/1997; Dixon, 1994; Freire, 2018). It is through dialogue among individuals and groups that unconscious assumptions and meaning structures are surfaced, discussed, and changed. Creating new organizational-level learning from the assessment process can lead to continued improvement in academic programs. This literature review included research that
incorporated organizational learning theories, organizational culture theories, motivation theories, and identified best practices for assessment of academic programs. A hypothesized model was proposed that included how the faculty motivation and organizational learning may impact implementation of assessment practices and institutional performance related to student satisfaction.
CHAPTER THREE: METHODOLOGY

The purpose of this proposed research study was to investigate the relationship between academic program assessment activities and perceived institutional performance in U.S. institutions of higher education. Using structural equation modeling (SEM), a proposed structure was examined between faculty motivation, organizational learning, implementation of assessment activities, and institutional performance. The methodology used to carry out this study is detailed in the following chapter.

Research Questions

The purpose of this structural equation model (SEM) study was to examine the relationship between organizational learning, motivation, the implementation of assessment practices, and institutional performance based on students’ educational satisfaction. Specifically, this study focused on the impact of faculty motivation and organizational learning on the implementation of assessment practices and institutional performance. To accomplish this, the following hypothesized structural model (see Figure 9) and corresponding research questions were explored:

1) Does the hypothesized structural model for Organizational Learning, Faculty Motivation, Implementation of Assessment Practices, and Institutional Performance produce an estimated population covariance matrix that is consistent with the sample covariance matrix? If the data do not fit the model, can the model be improved?
2) How much of the variance in Institutional Performance can be explained by the combined effect of Motivation, Organizational Learning, and Implementation of Assessment Practices in the model?

3) What are the direct effects, indirect effects, and total effects among the variables?

**Figure 9**

*Hypothesized Structural Model*

This study used a pragmatic approach informed by organizational learning theory (Argyris & Schon, 1978; Dixon, 1994; Senge, 2006; Watkins & Marsick, 1993) centered on dialogue and reflection that helps to bring unconscious influences of organizational culture into dialogue for future change (Dewey, 1915/1997; Freire, 1970/2018). The goal of the dialogue around assessment practices is to increase student learning and success to provide a more satisfying educational experience for the students.
Research Design

This study was designed as a nonexperimental quantitative study with measurements taken at a single point in time. It was nonexperimental because the independent, or exogenous, variables experienced the change prior to the implementation of this study (Warner, 2013). Data were collected via a survey instrument sent to the identified population. Structural equation modeling was the method of analysis used to measure the relationships between variables.

Hypothesized Structural Model

Organizational learning is the cumulative result of individual-, group-, and organizational-level learning that results in the non-human aspects of an organization, such as structures, policies, and espoused or in-use procedures to accomplish the work of the organization (Crossan et al., 1999; Schein, 2017). This was represented in the hypothesized structural model (see Figure 9) as an exogenous variable. Motivation was a latent variable that reflects three measured variables depicting regulations of external motivation (Deci & Ryan, 1985; Stupnisky et al., 2017): extrinsic, introjected, and autonomous. Single arrowhead lines from motivation to each regulation of external motivation represent that the latent variable was reflective of the measured variables (Kline, 2023). In this model, organizational learning and motivation were hypothesized to interact to positively impact the implementation of assessment practices. Implementation of assessment practices was a measured endogenous variable hypothesized to then positively impact institutional performance, another measured endogenous variable that was also impacted directly by organizational learning.
Value of Methodology

To examine the relationships between faculty motivation, organizational learning, implementation of assessment practices, and institutional performance, structural equation modeling (SEM) was used. SEM allowed researchers to examine and test the hypothesized causal effects between multiple independent variables and multiple dependent variables (Byrne, 2016; Kline, 2023). The exogenous independent variables in this model were motivation and organizational learning. The endogenous dependent variables were implementation of assessment practices and institutional performance. All variables in SEM can be either continuous or discrete and factors or measured variables (Ullman, 2019). This study used continuous variables on both factor and measured variables. SEM allowed the magnitude and directionality of causal effects to be examined while allowing for flexibility in identifying alternate solutions (Kline, 2023). Although causal effects were examined, SEM was not a technique for causal discovery but for testing an a priori model such as the one developed from the literature reviewed in chapter two and represented by Figure 9. Structural equation modeling also considered how measured variables related to latent variables that described the phenomena studied (Warner, 2013).

Population

The population considered for this study was faculty members teaching at U.S. located 4-year institutions granting bachelor’s degrees. According to the Bureau of Labor Statistics (BLS, Postsecondary Teachers, n.d.), there were 1,324,000 postsecondary teachers in 2021. According to the American Association of University Professors (AAUP Research Office, 2022), 48.5% of faculty in 2021 were adjunct or part-time, 23.6% were tenured professors, 12.6% were non-tenure track, 8.8% were tenure track, and 6.6% worked in
institutions without a tenure system. Neither the BLS (n.d.) nor the AAUP (2022) separated their statistics by type of institution at which the postsecondary teachers were employed.

**Sample Population**

The sample for this study was drawn from faculty with publicly available contact information and teaching at four-year institutions in Ohio, the ASSESS listserv, and through the researcher’s LinkedIn profile. The ASSESS listserv operates as a communication method for higher education professionals involved in assessment and accreditation activities at their institutions (ASSESS Listserv, n.d.). Therefore, some response bias from individuals supportive of assessment practices and having a higher likelihood of responding may have been realized (Remler & Van Ryzin, 2015). Because the study sample also included a broad invitation to faculty at institutions throughout Ohio, this bias was likely minimized.

Based on Baas et al.’s (2016) finding that faculty with administrative responsibilities are more likely to embrace assessment practices, respondents were asked if they currently held an administrative contract such as department chair or assistant/associate chair or other administrative role in addition to their instructional role. Skidmore et al. (2018) found that faculty from teacher education departments were more likely to be motivated in assessment by compliance due to the extreme compliance required in educator preparation programs. Therefore, a question was asked if the respondents’ academic units were accredited by a specialized program accreditor such as the Council for the Accreditation of Educator Preparation (CAEP).

Selected demographic data were collected on the survey instrument to assure inclusion principles were followed and to reduce the impact of outliers or missing data. Inclusion principles were determined from the type of institution (two-year or four-year) and
that the respondent had a faculty appointment. Faculty title was collected to see how respondents aligned with national distribution of faculty according to the AAUP (2022). Options included tenured, tenure-track, non-tenure track, no tenure available, and adjunct or part-time. Respondents were asked about the control of their institution (not-for-profit public, not-for-profit private, or for-profit), and the years of employment in higher education and at their current institution. Table 4 shows a comparison of faculty appointment types between the population and sample achieved in this study.

**Table 3**

*Faculty Appointment Type of the Population and Sample*

<table>
<thead>
<tr>
<th>Faculty Appointment Type</th>
<th>Population</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenured</td>
<td>23.6%</td>
<td>46.5%</td>
</tr>
<tr>
<td>Tenure-Track</td>
<td>8.8%</td>
<td>18.5%</td>
</tr>
<tr>
<td>Non-Tenure Track</td>
<td>12.6%</td>
<td>25.9%</td>
</tr>
<tr>
<td>No Tenure Available</td>
<td>6.6%</td>
<td>5.7%</td>
</tr>
<tr>
<td>Adjunct/Part-Time</td>
<td>48.5%</td>
<td>3.4%</td>
</tr>
</tbody>
</table>

*Note. N = 298.*

**Data Collection Procedures**

The following data collection procedures were designed and implemented to accomplish a representative sample from the population. The following explains the sampling methods and survey distribution and collection methods to attain an appropriate representative sample for this study.
Sampling Methods

To recruit a volunteer sample from the population, email addresses of 14,685 faculty located at four-year private and public institutions of higher education in Ohio were collected from their institutions’ public websites. Additionally, the invitation to participate in the study was shared nationally via the ASSESS listserv (1,000 members), two faculty listserves of colleges at the researcher’s home institution (201 members total), and on the researcher’s LinkedIn profile (796 impressions of the post). The ASSESS listserv was populated by assessment professionals in higher education and had a current subscription of over 1,000 individuals, including both faculty and administrators with an interest in or responsibility for institutional assessment (ASSESS Listserv, n.d.). In the request for responses, recipients were asked to share the survey link with faculty at their institution if they work at an institution within the inclusion guidelines. The researcher was connected with nearly 100 individuals via LinkedIn who had “professor” or “instructor” in their work histories and the post could be shared by other individuals to increase its reach. In total, it is estimated that the invitation could have been seen by 16,682 individuals.

Data Collection

Survey data were collected using online Qualtrics software (https://www.qualtrics.com) provided by the researcher’s institution. Access to the researcher’s software account required an institutional username, password, and two-factor authentication. After the survey closed, data were downloaded and kept on an institutional server assigned only to the researcher, and the file was password protected. Data screening and analysis was completed using IBM SPSS Statistics (Version 29) with Amos. The complete survey is available in Appendix B.
Survey Administration

Data were collected through volunteer recruitment using the ASSESS listserv, posting on the researcher’s LinkedIn profile, and via direct email solicitation. The invitation reached 16,682 individuals and included a link to the survey built in Qualtrics (http://www.qualtrics.com) software. Recruitment of participants began October 2, 2023, and concluded on October 31, 2023. Individuals who completed the survey spent 10-12 minutes doing so. Primary analysis of the data began shortly after the data collection period ended.

An incentive of three $50 gift cards were offered to encourage participation. Respondents were given the opportunity to submit their email address in a separate context from the survey instrument to be considered for a random drawing once the survey was closed.

Response Rate

There were 434 total responses to the survey. Following final changes to the survey before it was deployed, the instrument was not given a final check, resulting in inaccurate survey piping and a sizable number of respondents not answering any of the construct questions (n = 61). Responses were also deemed invalid if the respondent did not consent to the study (n = 5), did not identify as representing a four-year institution (n = 12), did not have a faculty appointment (n = 38), or did not complete the survey (n = 20) leaving a total of 298 initial responses. Based on the estimated distribution of 16,682 individuals, the response rate of this survey was 1.79%. Individuals were invited only once, unless they received the invitation through multiple distribution channels, and no follow-up was done as the survey was completely anonymous by design and there was not a way to identify if someone had responded.
Sample Size

Kline (2023) recommended a sample size to follow the ratio, $N:q$ of 20:1 where $N$ is the number of cases and $q$ represents the number of model parameters requiring statistical estimates. The hypothesized structural model (see Figure 9) had thirteen parameters that required statistical estimates. Therefore, according to Kline (2023), a sample size of $20 \times 13 = 260$ cases. Therefore, the initial sample of 298 cases achieved was sufficient for this study.

Instrumentation

A survey was developed to collect respondent demographics and responses to the four construct scales in the hypothesized model: Organizational Learning (OL), Motivation (Mot), Implementation of Assessment Practices (IAP), and Institutional Performance (Perf; see Table 3). The survey included 79 items constructed from the demographic information detailed above, a created scale for the implementation of assessment best practices, and three validated questionnaires used to measure organizational learning, motivation, and institutional performance (see Table 3). The following section delineates how the initial dataset of 298 cases was examined for missing data, how the reliability and validity of each construct for previously validated instruments was confirmed for this study, and the creation of parcel and construct variables for use in the final SEM analysis.
Table 4

Summary of Survey Questions

<table>
<thead>
<tr>
<th>Survey Content</th>
<th>Items</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographic information</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Organizational learning</td>
<td>35</td>
<td>Bontis et al. (2002)</td>
</tr>
<tr>
<td>Motivation</td>
<td>12</td>
<td>Stupnisky et al. (2017, 2018)</td>
</tr>
<tr>
<td>Implementation of assessment practices</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Institutional performance</td>
<td>9</td>
<td>Ewell (1989)</td>
</tr>
</tbody>
</table>

Missing Data

Newman (2014) characterized missing data into three categories of missingness: Full Response, Partial Response, and Nonresponse. A full response to the survey was a case in which all constructs were responded to even though there may be missing items; for the construct a full response was when all questions related to the construct were answered. A nonresponse for the survey was a case in which none of the constructs have a response while a construct nonresponse was one in which no construct items have a response. A partial response to the survey was a case in which only a portion of the constructs have a response whereas a construct partial response had missing items within the construct. Table 5 delineates the initial categories of missingness for the survey and each construct within the survey. Fourteen cases (4.7%) included unanswered responses to one or more of the 12 True/False items in the Implementation of Assessment Practices (IAP). The missing responses were considered False responses (see Table 6).
Table 5

Response Summary by Construct (N = 298)

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Survey</th>
<th>OL</th>
<th>Mot</th>
<th>IAP</th>
<th>Perf</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Construct Items</td>
<td>62</td>
<td>35</td>
<td>12</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td>Full Response</td>
<td>240</td>
<td>282</td>
<td>287</td>
<td>298</td>
<td>257</td>
</tr>
<tr>
<td></td>
<td>(80.5%)</td>
<td>(94.6%)</td>
<td>(96.3%)</td>
<td>(100.0%)</td>
<td>(86.2%)</td>
</tr>
<tr>
<td>Partial Response</td>
<td>58</td>
<td>16</td>
<td>11</td>
<td>0</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>(19.5%)</td>
<td>(5.4%)</td>
<td>(3.7%)</td>
<td>(0.0%)</td>
<td>(13.8%)</td>
</tr>
</tbody>
</table>

Note. OL = Organizational Learning construct; Mot = Motivation construct; IAP = Implementation of Assessment Practices construct; Perf = Institutional Performance construct.

Table 6

Missing Items for Implementation of Assessment Practices (IAP)

<table>
<thead>
<tr>
<th>Item</th>
<th>Missing</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>IAP_1</td>
<td>4</td>
<td>1.3</td>
</tr>
<tr>
<td>IAP_2</td>
<td>4</td>
<td>1.3</td>
</tr>
<tr>
<td>IAP_3</td>
<td>6</td>
<td>2.0</td>
</tr>
<tr>
<td>IAP_4</td>
<td>7</td>
<td>2.3</td>
</tr>
<tr>
<td>IAP_5</td>
<td>9</td>
<td>3.0</td>
</tr>
<tr>
<td>IAP_6</td>
<td>9</td>
<td>3.0</td>
</tr>
<tr>
<td>IAP_7</td>
<td>9</td>
<td>3.0</td>
</tr>
<tr>
<td>IAP_8</td>
<td>9</td>
<td>3.0</td>
</tr>
<tr>
<td>IAP_9</td>
<td>7</td>
<td>2.3</td>
</tr>
<tr>
<td>IAP_11</td>
<td>9</td>
<td>3.0</td>
</tr>
<tr>
<td>IAP_12</td>
<td>7</td>
<td>2.3</td>
</tr>
<tr>
<td>IAP_13</td>
<td>8</td>
<td>2.7</td>
</tr>
</tbody>
</table>

Note. N = 298.
The Institutional Performance construct had an excessively high level of missingness overall (13.8%) and on specific items (see Table 7). To further explore the missing data, the Institutional Performance (Perf) variables and factors were reviewed for face and construct validity. The researchers who previously used this scale (Al Shraah et al., 2023; Ewell, 1989; Kwan & Walker, 2003; Lejeune & Vas, 2009; Smart, 2003) generally found sufficient, although not overwhelming, support to include the three factors in their research. When the population surveyed was primarily administrators (Cameron, 1978, 1981; Ewell, 1989; Lejeune & Vas, 2009), the support for Student Experience Satisfaction (Perf_SES) was less definitive than when faculty were included (Al Shraah et al., 2023; Kwan & Walker, 2003; Smart, 2003). Likewise, the support for Student Career Development (Perf_SCD) and Student Academic Development (Perf_SAD) was stronger when the respondents were primarily administrators. Less than half of the respondents in the current study (41.5%) identified themselves as having administrative responsibilities, which included program directors and assistant or associate chairs and deans, all of whom may be more familiar with the student experience at their institution than senior administrators. The items with the most missing data in the Institutional Performance construct (Perf_4, Perf_5, Perf_7, Perf_8, and Perf_9) relate to faculty perceptions of students’ post-graduation plans and students’ academic development, something the faculty respondents may not be aware of by student cohort, as the questions were worded.

Based on the variances among respondents highlighted in the literature and this study and the face validity concerns of the factors, items Perf_4 through Perf_9 were removed from the analysis. As a result, the 41 partial responses to the Institutional Performance construct became full responses, bringing full responses to the survey to 274 (92.6%). Each remaining
variable had less than 5% missing data. The 24 cases with missing data (7.4%) were removed because they were less than 10% of the sample (Kline, 2023).

Table 7

*Missing Values for Institutional Performance (Perf) Items*

<table>
<thead>
<tr>
<th>Factor</th>
<th>Item</th>
<th>Missing Values</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perf_SES</td>
<td>Perf_1</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td>Perf_2</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td>Perf_3</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Perf_SCD</td>
<td>Perf_4</td>
<td>16</td>
<td>5.4</td>
</tr>
<tr>
<td></td>
<td>Perf_5</td>
<td>28</td>
<td>9.4</td>
</tr>
<tr>
<td></td>
<td>Perf_6</td>
<td>1</td>
<td>0.3</td>
</tr>
<tr>
<td>Perf_SAD</td>
<td>Perf_7</td>
<td>23</td>
<td>7.7</td>
</tr>
<tr>
<td></td>
<td>Perf_8</td>
<td>13</td>
<td>4.4</td>
</tr>
<tr>
<td></td>
<td>Perf_9</td>
<td>21</td>
<td>7.0</td>
</tr>
</tbody>
</table>

*Note. N = 298. Perf_SES = Student Experience Satisfaction; Perf_SCD = Student Career Development; Perf_SAD = Student Academic Development.*

Organizational Learning

The Strategic Learning Assessment Map (SLAM) instrument developed by Bontis et al. (2002) was used to assess Organizational Learning in this study. It was based on the 4i Framework developed by Crossan et al. (1999) which identified three learning stocks where knowledge is held by an individual (ILL), group (GLL), or organization (OLL). Two flows, referred to as feedback (FB) and feed forward (FF), represent the flow of information between the individual, group, and organizational levels with feedback moving from the organizational level to the group or individual levels and exploiting the knowledge of the
organization and group. Exploration of knowledge in the feed forward flow moves from the individual level to the group or organizational levels (Crossan et al., 1999). Bontis et al. (2002) used 35 of the original 50 items in their analysis to determine if each stock independently influenced performance and if the misalignment of the stocks and flows impeded performance. They also found high correlation between the flow processes (FB and FF) but combined the two factors into one in their final analysis. They found that each of the individual stocks of learning had an impact on organizational performance while organizational-level-learning was the strongest of the three stocks (Bontis et al., 2002). Real et al. (2006, 2014) found the five factors together reflected the overarching construct of organizational learning in their SEM models.

The SLAM instrument was used by Bontis et al. (2002) to assess the perceptions of individuals in mutual fund companies of their organizations’ stocks and flows of learning and related those perceptions to the employees’ perceptions of their organization’s financial performance. Their study retained 35 of the original 50 questions due to factor loading concerns. Respondents answered the questions based on a Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The survey and measurements were developed through three separate pilot studies to insure reliability and validity of the items and measures (Bontis et al., 2002).

All five constructs in Bontis et al.’s (2002) research had adequate internal reliability and discriminate validities between 0.72 and 0.79 (Spector, 1992). The study of the SLAM instrument found that all three stocks of learning were significant and positively related to organizational performance (Bontis et al., 2002). Real et al. (2014) used Bontis et al.’s (2002) instrument to create one construct of Organizational Learning with correlations between 0.86
and 0.92 using partial least squares. Both Bontis et al. (2002) and Real et al.’s (2014) populations were constructed from for-profit business environments.

This study used the SLAM instrument to assess the Organizational Learning construct. Fifteen questions that did not load on factors in Bontis et al.’s (2002) research were excluded from this study to improve the construct validity (Petter et al., 2007) and reduce the overall length of the questionnaire (see Table 8). Permission to use the SLAM instrument was provided by the copyright owner (see Appendix D). Due to the differences in respondent populations and settings used between Bontis et al.’s (2002) research and this study, the reliability and validity of the instrument was reviewed and factors confirmed through EFA before parceling the data by factor and creating a composite score for the construct.

**Reliability & Validity**

An exploratory factor analysis (EFA) was conducted on the Organizational Learning scale in preparation for parcel and composite creation (Little et al., 2013). The sample size was 274 cases with no missing data, sufficient for a factor analysis (Tabachnick & Fidell, 2019). Normality was confirmed with all item-level skewness less than the absolute value of 1 and kurtosis less than the absolute value of 3 (Kline, 2023).

Due to the number of variables in the Organizational Learning construct \( n = 35 \), examination of all pairs of scatterplots for linearity was impractical. Therefore, Tabachnick and Fidell (2019) suggested spot checking pairs of variables with the greatest distance between their skewness. Scatterplots were checked for the three variables with the most skewness (FF_6, OLL_7, and OLL_5) and the three variables with the least skewness (ILL_2, GLL_2, and ILL_5). Some pairs exhibited linearity while others did not; however,
none of the pairs exhibited curvilinearity and the factor analysis proceeded without transformation (see Figure 10).

Table 8

Summary of Strategic Learning Assessment Map (SLAM) Scales

<table>
<thead>
<tr>
<th>Factor</th>
<th>Items</th>
<th>Associated Concept</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual-Level Learning (ILL)</td>
<td>9</td>
<td>Individual competence, capability, and motivation to undertake the required tasks</td>
</tr>
<tr>
<td>Group-Level Learning (GLL)</td>
<td>8</td>
<td>Group dynamics and the development of shared understanding</td>
</tr>
<tr>
<td>Organizational-Level Learning (OLL)</td>
<td>7</td>
<td>Alignment between the non-human storehouses of learning including systems, structure, strategy, procedures, and culture; given the competitive environment</td>
</tr>
<tr>
<td>Feed Forward (FF)</td>
<td>7</td>
<td>Whether and how individual learning feeds forward into group learning and learning at the organizational level (e.g., changes to structure, systems, products, strategy, procedures, culture)</td>
</tr>
<tr>
<td>Feedback (FB)</td>
<td>4</td>
<td>Whether and how the learning that is embedded in the organization (e.g., systems, structure, strategy) affects individual and group learning</td>
</tr>
</tbody>
</table>

Note. Adapted from Bontis et al. (2002)

Multicollinearity and singularity were checked using the tolerance and VIF statistics. No issues were discovered for tolerance less than 1.00 or VIF greater than 10.0 (Tabachnick & Fidell, 2019).

The data were screened for multivariate outliers using Mahalanobis distance in SPSS Regression. Fourteen cases (5.1%) had Mahalanobis distance exceeding the critical value ($\chi^2_{[35]} = 66.619, p < .001$). Each case was reviewed and responses to all but one case were within expectations. One case (0.4%) contained a high prevalence of responses to the
Organizational Learning items with 1 (Strongly disagree) and was removed. The analysis continued with 273 cases.

Figure 10

Scatterplots for Selected Organizational Learning Items

Factorability of $R$ was assessed using a correlation matrix, Bartlett’s test of sphericity, and Kaiser-Meyer-Olkin measure of sampling adequacy (KMO; Tabachnick & Fidell, 2019). Most of the correlations in the correlation matrix exceeded 0.30 and were statistically significant, suggesting that there is a relationship between the pairs of variables and that $R$ was factorable. Bartlett’s test of sphericity was statistically significant ($\chi^2 [595] = 8,581.78, p < .001$), indicating the factorability of $R$. Finally, the KMO value was 0.965, greater than the minimum threshold of 0.50 (Kaiser & Rice, 1974). Based on all three indicators, $R$ was deemed factorable in this study and the EFA proceeded.
The initial EFA was performed in IBM SPSS Statistics (Version 29.0) using principal components analysis with varimax rotation and Kaiser normalization. Four components were identified with initial Eigenvalues greater than 1.0 explaining 69.00% of the variance (see Table 9).

### Table 9

*Initial Eigenvalues, Percentages of Variance and Cumulative Percentages of Components for 35 Organizational Learning Items (N = 273)*

<table>
<thead>
<tr>
<th>Factor</th>
<th>Eigenvalue</th>
<th>% of Variance</th>
<th>Cumulative %</th>
</tr>
</thead>
<tbody>
<tr>
<td>OLL</td>
<td>18.29</td>
<td>52.27</td>
<td>52.27</td>
</tr>
<tr>
<td>GLL</td>
<td>2.99</td>
<td>8.55</td>
<td>60.82</td>
</tr>
<tr>
<td>ILL</td>
<td>1.80</td>
<td>5.23</td>
<td>66.05</td>
</tr>
<tr>
<td>Flows</td>
<td>1.03</td>
<td>2.95</td>
<td>69.00</td>
</tr>
</tbody>
</table>

*Note. OLL = Organizational-Level Learning; GLL = Group-Level Learning; ILL = Individual-Level Learning.*

The four components were then examined using varimax rotation. Multiple concerns appeared from the factoring (see Table 10). First, ILL_9 had a loading below 0.55, a level considered to be good, although it was above the minimum of 0.32 (Tabachnick & Fidell, 2019). All of the flow (FB and FF) items except FB_3 and FB_4 had low loadings and cross-loaded (difference between primary and secondary loadings > 0.20) on both the flow and Organization Level Learning (OLL) components.
Table 10

Loadings and Communalities for Varimax Rotated Four-Component Solution for Organizational Learning Items ($N = 273$)

<table>
<thead>
<tr>
<th>Factor Loadings</th>
<th>OLL</th>
<th>GLL</th>
<th>ILL</th>
<th>Flows (FB, FF)</th>
<th>Communalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>ILL_5</td>
<td>0.76</td>
<td></td>
<td></td>
<td></td>
<td>0.70</td>
</tr>
<tr>
<td>ILL_2</td>
<td>0.72</td>
<td></td>
<td></td>
<td></td>
<td>0.67</td>
</tr>
<tr>
<td>ILL_7</td>
<td>0.72</td>
<td></td>
<td></td>
<td></td>
<td>0.72</td>
</tr>
<tr>
<td>ILL_7</td>
<td>0.72</td>
<td></td>
<td></td>
<td></td>
<td>0.72</td>
</tr>
<tr>
<td>ILL_3</td>
<td>0.71</td>
<td></td>
<td></td>
<td></td>
<td>0.63</td>
</tr>
<tr>
<td>ILL_4</td>
<td>0.71</td>
<td></td>
<td></td>
<td></td>
<td>0.60</td>
</tr>
<tr>
<td>ILL_6</td>
<td>0.69</td>
<td></td>
<td></td>
<td></td>
<td>0.67</td>
</tr>
<tr>
<td>ILL_8</td>
<td>0.65</td>
<td></td>
<td></td>
<td></td>
<td>0.68</td>
</tr>
<tr>
<td>ILL_1</td>
<td>0.60</td>
<td></td>
<td></td>
<td></td>
<td>0.49</td>
</tr>
<tr>
<td>ILL_9</td>
<td>0.53</td>
<td></td>
<td></td>
<td></td>
<td>0.52</td>
</tr>
<tr>
<td>GLL_7</td>
<td>0.82</td>
<td></td>
<td></td>
<td></td>
<td>0.81</td>
</tr>
<tr>
<td>GLL_3</td>
<td>0.81</td>
<td></td>
<td></td>
<td></td>
<td>0.79</td>
</tr>
<tr>
<td>GLL_1</td>
<td>0.79</td>
<td></td>
<td></td>
<td></td>
<td>0.73</td>
</tr>
<tr>
<td>GLL_8</td>
<td>0.78</td>
<td></td>
<td></td>
<td></td>
<td>0.79</td>
</tr>
<tr>
<td>GLL_4</td>
<td>0.76</td>
<td></td>
<td></td>
<td></td>
<td>0.84</td>
</tr>
<tr>
<td>GLL_5</td>
<td>0.74</td>
<td></td>
<td></td>
<td></td>
<td>0.71</td>
</tr>
<tr>
<td>GLL_6</td>
<td>0.72</td>
<td></td>
<td></td>
<td></td>
<td>0.75</td>
</tr>
<tr>
<td>GLL_2</td>
<td>0.71</td>
<td></td>
<td></td>
<td></td>
<td>0.65</td>
</tr>
<tr>
<td>OLL_3</td>
<td>0.82</td>
<td></td>
<td></td>
<td></td>
<td>0.84</td>
</tr>
<tr>
<td>OLL_2</td>
<td>0.78</td>
<td></td>
<td></td>
<td></td>
<td>0.82</td>
</tr>
<tr>
<td>OLL_1</td>
<td>0.77</td>
<td></td>
<td></td>
<td></td>
<td>0.78</td>
</tr>
<tr>
<td>OLL_4</td>
<td>0.77</td>
<td></td>
<td></td>
<td></td>
<td>0.78</td>
</tr>
<tr>
<td>OLL_6</td>
<td>0.75</td>
<td></td>
<td></td>
<td></td>
<td>0.76</td>
</tr>
<tr>
<td>OLL_5</td>
<td>0.73</td>
<td></td>
<td></td>
<td></td>
<td>0.75</td>
</tr>
<tr>
<td>OLL_7</td>
<td>0.69</td>
<td></td>
<td></td>
<td></td>
<td>0.74</td>
</tr>
<tr>
<td>FF_4</td>
<td>0.60</td>
<td></td>
<td></td>
<td>0.53</td>
<td>0.73</td>
</tr>
</tbody>
</table>
The cross-loading of the flows with OLL was unexpected and could be attributed to the individualistic culture of higher education faculty that acts against the practice of dialogue required for collaborative learning (Boyce, 2003; Dee & Leišytė, 2016; Ewell, 1997; Holyoke et al., 2012). In reviewing the questions, several of the items in the Feedback and Feed Forward groupings asked about company policies and procedures or considerations of organizational processes and procedures. Based on the individualistic nature of higher education and the wording of these questions, the Flow component was determined to be not well defined in the initial extraction and the items removed from the second analysis.

The second factor analysis used principal axis factoring with varimax rotation and Kaiser normalization. Only items related to ILL, GLL, and OLL were included in this analysis with 273 cases. The analysis forced three factors from the items based on the initial extraction. Each factor had initial Eigenvalues greater than 1.0 and explained 71.81% of the variance (see Table 11).
Table 11

*Initial Eigenvalues, Percentages of Variance and Cumulative Percentages of Factors for 23 Organizational Learning Items (N = 273)*

<table>
<thead>
<tr>
<th>Factor</th>
<th>Eigenvalue</th>
<th>% of Variance</th>
<th>Cumulative %</th>
</tr>
</thead>
<tbody>
<tr>
<td>OLL</td>
<td>13.19</td>
<td>54.95</td>
<td>54.95</td>
</tr>
<tr>
<td>GLL</td>
<td>2.24</td>
<td>9.35</td>
<td>64.30</td>
</tr>
<tr>
<td>ILL</td>
<td>1.80</td>
<td>7.51</td>
<td>71.81</td>
</tr>
</tbody>
</table>

Note. OLL = Organizational-Level Learning; GLL = Group-Level Learning; ILL = Individual-Level Learning.

The three factors were then examined using varimax rotation. The only concern from the factoring (see Table 12) was that ILL_9 had a loading below 0.55 and cross-loaded with the OLL factor. After reviewing the question, the decision was made to keep the second factor analysis as sufficient to explain the Organizational Learning construct. This is consistent with Bontis et al.’s (2002) use of the three stocks of learning separate from the flows of learning. The three stocks of learning factors from the SLAM instrument were kept.

Analysis of reliability for each factor of the SLAM instrument for this study was performed. According to George and Mallery (2003), Cronbach’s alpha coefficients above 0.70 are acceptable, above 0.80 are good, and above 0.90 are excellent. The SLAM (Bontis et al., 2002) Organizational Learning stock factors were each found to have excellent reliabilities (α > 0.80) in this study that were comparable to the literature (see Table 13). As a result, the reliability and validity of the Organizational Learning factors in this study were confirmed and the items were combined into parcels and composite scores.
Table 12

Factor Loadings and Communalities for Varimax Rotated Three-Factor Solution for 23 Organizational Learning Items (N = 273)

<table>
<thead>
<tr>
<th>Factor Loadings</th>
<th>GLL</th>
<th>OLL</th>
<th>ILL</th>
<th>Communalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>ILL_5</td>
<td>0.75</td>
<td></td>
<td>0.66</td>
<td></td>
</tr>
<tr>
<td>ILL_7</td>
<td>0.72</td>
<td></td>
<td>0.70</td>
<td></td>
</tr>
<tr>
<td>ILL_2</td>
<td>0.69</td>
<td></td>
<td>0.62</td>
<td></td>
</tr>
<tr>
<td>ILL_3</td>
<td>0.66</td>
<td></td>
<td>0.57</td>
<td></td>
</tr>
<tr>
<td>ILL_4</td>
<td>0.66</td>
<td></td>
<td>0.52</td>
<td></td>
</tr>
<tr>
<td>ILL_6</td>
<td>0.66</td>
<td></td>
<td>0.61</td>
<td></td>
</tr>
<tr>
<td>ILL_8</td>
<td>0.65</td>
<td></td>
<td>0.65</td>
<td></td>
</tr>
<tr>
<td>ILL_1</td>
<td>0.55</td>
<td></td>
<td>0.42</td>
<td></td>
</tr>
<tr>
<td>ILL_9</td>
<td>0.41</td>
<td>0.50</td>
<td>0.48</td>
<td></td>
</tr>
<tr>
<td>GLL_7</td>
<td>0.81</td>
<td></td>
<td>0.79</td>
<td></td>
</tr>
<tr>
<td>GLL_3</td>
<td>0.80</td>
<td></td>
<td>0.76</td>
<td></td>
</tr>
<tr>
<td>GLL_8</td>
<td>0.77</td>
<td></td>
<td>0.77</td>
<td></td>
</tr>
<tr>
<td>GLL_4</td>
<td>0.76</td>
<td></td>
<td>0.84</td>
<td></td>
</tr>
<tr>
<td>GLL_1</td>
<td>0.75</td>
<td></td>
<td>0.68</td>
<td></td>
</tr>
<tr>
<td>GLL_5</td>
<td>0.71</td>
<td></td>
<td>0.66</td>
<td></td>
</tr>
<tr>
<td>GLL_6</td>
<td>0.70</td>
<td></td>
<td>0.71</td>
<td></td>
</tr>
<tr>
<td>GLL_2</td>
<td>0.67</td>
<td></td>
<td>0.59</td>
<td></td>
</tr>
<tr>
<td>OLL_3</td>
<td>0.84</td>
<td></td>
<td>0.82</td>
<td></td>
</tr>
<tr>
<td>OLL_2</td>
<td>0.82</td>
<td></td>
<td>0.81</td>
<td></td>
</tr>
<tr>
<td>OLL_1</td>
<td>0.79</td>
<td></td>
<td>0.77</td>
<td></td>
</tr>
<tr>
<td>OLL_4</td>
<td>0.78</td>
<td></td>
<td>0.73</td>
<td></td>
</tr>
<tr>
<td>OLL_6</td>
<td>0.78</td>
<td></td>
<td>0.74</td>
<td></td>
</tr>
<tr>
<td>OLL_5</td>
<td>0.75</td>
<td></td>
<td>0.72</td>
<td></td>
</tr>
<tr>
<td>OLL_7</td>
<td>0.74</td>
<td></td>
<td>0.68</td>
<td></td>
</tr>
</tbody>
</table>
Table 13

Reliability of Strategic Learning Assessment Map (SLAM) Scales

<table>
<thead>
<tr>
<th>Factor</th>
<th>Items</th>
<th>Cronbach’s α</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Real et al. (2014)</td>
<td>Current Study</td>
<td></td>
</tr>
<tr>
<td>Individual-Level Learning (ILL)</td>
<td>9</td>
<td>0.91</td>
<td>0.92</td>
<td></td>
</tr>
<tr>
<td>Group-Level Learning (GLL)</td>
<td>8</td>
<td>0.90</td>
<td>0.95</td>
<td></td>
</tr>
<tr>
<td>Organizational-Level Learning (OLL)</td>
<td>7</td>
<td>0.90</td>
<td>0.96</td>
<td></td>
</tr>
</tbody>
</table>

Creation of Composite Score

Parceling allows researchers reduce the number of variables in an SEM analysis (Bandalos & Finney, 2001; Kline, 2023). Little et al. (2002) and Bandalos and Finney (2001) emphasized that parceling is best conducted only when constructs have been found to be unidimensional. Little et al. (2013) identified additional benefits of parceling beyond reducing the overall indicators in the model: (a) more reliability for parceled indicators over individual responses; (b) generally higher ratios of communality in parcels than items; and (c) fewer sampling error sources. Parceling is recommended for SEM studies with the goal of estimating structural parameters as is the purpose of the current study (Rhemtulla, 2016).

Two primary concerns of parceling in structural equation modeling are the loss of multidimensionality in constructs and model misspecification (Little et al., 2002). Within this model, the only construct for which factors were warranted was Motivation. Organizational Learning and Institutional Performance items were parceled by factor then combined into one construct variable. The focus on the hypothesized structural model for this research was on the construct interactions and not the interactions of the factors, other than for Motivation, allowing parceling to continue (Little et al., 2013; Rhemtulla, 2016). Prior to parceling...
individual items, factor analyses were performed (Little et al., 2002; Marsh et al., 2013) to confirm the factorial structure of Organizational Learning (Bontis et al., 2002; Real et al., 2014), Institutional Performance (Al Shraah et al., 2023; Cameron, 1978), and the Regulation factors of Motivation (Stupnisky et al., 2018, 2019).

There are three commonly used parceling methods: random parceling, balancing approach, and facet-representative parceling (Bandalos & Finney, 2001; Little et al., 2002, 2013). In random parceling the researcher chooses random items within a factor to create a parcel. Balanced parceling pairs the items with the greatest and least scale loadings or correlations into one parcel. Facet- or domain-representative parceling involves combining items from each factor into one parcel or an item from each factor into one parcel (Bandalos & Finney, 2001; Little et al., 2002, 2013).

Facet-representative parceling was used in this study because the factors had a well-researched factorial structure (Little et al., 2013) that was confirmed. Items were parceled for each Organizational Learning factor by calculating the mean of each cases’ responses within the factors. This resulted in parceled scores for Individual-Level Learning (Parc_ILL), Group-Level Learning (Parc_GLL), and Organizational-Level Learning (Parc_OLL). A composite score for Organizational Learning (Comp_OL), was created by summing the three factor parcels in the construct. The resulting parcel and composite score statistics are summarized in Table 14.
Table 14

Summary of Parceled and Composite Scores for Organizational Learning

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parc_Ill</td>
<td>4.88</td>
<td>1.07</td>
<td>-0.49</td>
<td>0.03</td>
</tr>
<tr>
<td>Parc_Gll</td>
<td>4.56</td>
<td>1.44</td>
<td>-0.45</td>
<td>-0.70</td>
</tr>
<tr>
<td>Parc_Oll</td>
<td>3.70</td>
<td>1.49</td>
<td>-0.04</td>
<td>-0.83</td>
</tr>
<tr>
<td>Comp_ol</td>
<td>13.14</td>
<td>3.52</td>
<td>-0.34</td>
<td>-0.39</td>
</tr>
</tbody>
</table>

Note. N = 273. Parc_Oll = parceled Organizational-Level Learning; Parc_Gll = parceled Group-Level Learning; Parc_Ill = parceled Individual-Level Learning. ILL, GLL, and OLL were measured on a seven-point Likert scale.

Motivation

Based on the self-determination theory (Deci & Ryan, 2000b), Stupnisky and colleagues used a motivation scale to evaluate how faculty motivation predicts use of teaching best practices (Stupnisky et al., 2018) and research success perception and number of publications (Stupnisky et al., 2019). In both of Stupnisky et al.’s (2018, 2019) studies, the research teams used the same measurements that provided sufficient reliability to the constructs. The scale for Stupnisky et al.’s (2018, 2019) 12-question instrument were from 4 (very much) to 1 (very little). Also in both studies, the intrinsic and identified scales were independently measured and later combined into the Autonomous regulation scale due to high correlations (Stupnisky et al., 2018, 2019). The original research to develop the scale on which Stupnisky et al.’s (2018, 2019) research was based used the seven-point Likert scale for a 19-item survey (Gagné et al., 2016).
The current study used the 12 items replicated from Stupnisky et al.’s (2018) research to evaluate faculty members’ motivation related to teaching activities, which is expected to include assessment. In contrast to Stupnisky et al.’s (2018) survey, the original seven-point Likert scale used by Gagné et al. (2016) ranging from 1 (strongly disagree) to 7 (strongly agree) was used for the current study.

**Reliability & Validity**

An EFA was performed on the Motivation construct with the current sample of 273 cases in preparation for parcel creation (Little et al., 2013). There was no missing data in the sample and the size of the dataset was sufficient for factor analysis (Tabachnick & Fidell, 2019).

In evaluating normality of the Motivation items, several items had concerns of skewness greater than the absolute value of 1 but below the absolute value of 2. Mot_6 also had concerns of kurtosis greater than the absolute value of 3 but below the absolute value of 7 (see Table 15). While Tabachnick and Fidell (2019) suggested limits for skewness at less than the absolute value of 1 and kurtosis at less than the absolute value of 3, Curran, et al. (1996) found that serious problems are encountered in EFA when the skewness exceeds $|2.0|$ and kurtosis exceeds $|7.0|$. The EFA analysis proceeded with sufficient normality without transformation.

Multivariate outliers were identified using Mahalanobis distance; eight cases were identified exceeding the chi-square critical value ($\chi^2[12] = 32.910, p < .001$). Each case was reviewed and the responses on all but one were deemed tolerable for the questions in the construct. One case was determined to contain long-string responses (Ward & Meade, 2023) and was removed. Removal of that case resulted in a dataset of 272 cases for further analysis.
ACADEMIC PROGRAM ASSESSMENT & STUDENT SATISFACTION

Table 15

Summary of 12 Motivation Items (N = 272)

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mot_1</td>
<td>5.62</td>
<td>1.29</td>
<td>-0.83</td>
<td>0.19</td>
</tr>
<tr>
<td>Mot_2</td>
<td>6.10</td>
<td>1.04</td>
<td>-1.20</td>
<td>1.07</td>
</tr>
<tr>
<td>Mot_3</td>
<td>6.16</td>
<td>1.02</td>
<td>-1.22</td>
<td>0.77</td>
</tr>
<tr>
<td>Mot_4</td>
<td>6.06</td>
<td>1.07</td>
<td>-1.29</td>
<td>1.98</td>
</tr>
<tr>
<td>Mot_5</td>
<td>5.77</td>
<td>1.35</td>
<td>-1.27</td>
<td>1.39</td>
</tr>
<tr>
<td>Mot_6</td>
<td>6.27</td>
<td>0.99</td>
<td>-1.61</td>
<td>3.31</td>
</tr>
<tr>
<td>Mot_7</td>
<td>4.27</td>
<td>2.03</td>
<td>-0.19</td>
<td>-1.18</td>
</tr>
<tr>
<td>Mot_8</td>
<td>4.06</td>
<td>2.06</td>
<td>-0.06</td>
<td>-1.28</td>
</tr>
<tr>
<td>Mot_9</td>
<td>3.94</td>
<td>2.06</td>
<td>-0.01</td>
<td>-1.26</td>
</tr>
<tr>
<td>Mot_10</td>
<td>5.62</td>
<td>1.59</td>
<td>-1.16</td>
<td>0.65</td>
</tr>
<tr>
<td>Mot_11</td>
<td>5.04</td>
<td>1.90</td>
<td>-0.66</td>
<td>-0.68</td>
</tr>
<tr>
<td>Mot_12</td>
<td>5.39</td>
<td>1.82</td>
<td>-1.01</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Note. Motivation items were measured on a seven-point Likert scale.

Linearity was checked using scatterplots for the variables. None of the variable pairs exhibited curvilinear tendencies and the factor analysis continued without transformation. Multicollinearity and singularity were checked using the tolerance and VIF with no concerns identified.

Factorability of R was assessed using a correlation matrix (see Table 16), Bartlett’s test of sphericity, and KMO (Tabachnick & Fidell, 2019). Correlations were above 0.30 and statistically significant within the expected factor items but not between them, suggesting that there is a relationship between the pairs of variables and that R was factorable. Bartlett’s test of sphericity was statistically significant ($\chi^2 [66] = 1,954.86, p < .001$) for the group of
12 items. Finally, the KMO value was 0.80, greater than the minimum threshold of 0.50 (Kaiser & Rice, 1974). Given the totality of indicators, it was determined that R was factorable and the EFA proceeded.

### Table 16

*Correlation Table for Motivation Items (N=272)*

<table>
<thead>
<tr>
<th></th>
<th>Mot_1</th>
<th>Mot_2</th>
<th>Mot_3</th>
<th>Mot_4</th>
<th>Mot_5</th>
<th>Mot_6</th>
<th>Mot_7</th>
<th>Mot_8</th>
<th>Mot_9</th>
<th>Mot_10</th>
<th>Mot_11</th>
<th>Mot_12</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1.00</td>
<td>0.763**</td>
<td>0.748**</td>
<td>0.462**</td>
<td>0.447**</td>
<td>0.367**</td>
<td>0.116</td>
<td>0.065</td>
<td>0.072</td>
<td>-0.001</td>
<td>-0.032</td>
<td>-0.012</td>
</tr>
<tr>
<td>3</td>
<td>1.00</td>
<td>0.844**</td>
<td>0.585**</td>
<td>0.454**</td>
<td>0.526**</td>
<td>0.451**</td>
<td>0.098</td>
<td>0.030</td>
<td>0.062</td>
<td>0.027</td>
<td>-0.067</td>
<td>-0.016</td>
</tr>
<tr>
<td>4</td>
<td>1.00</td>
<td>0.571**</td>
<td>0.364**</td>
<td>0.407**</td>
<td>0.498**</td>
<td>0.407**</td>
<td>0.174**</td>
<td>0.140</td>
<td>0.171**</td>
<td>0.138</td>
<td>0.058</td>
<td>0.029</td>
</tr>
<tr>
<td>5</td>
<td>1.00</td>
<td>0.498**</td>
<td>0.844**</td>
<td>0.484**</td>
<td>0.526**</td>
<td>0.407**</td>
<td>0.172**</td>
<td>0.109</td>
<td>0.575**</td>
<td>0.229</td>
<td>0.093</td>
<td>0.024</td>
</tr>
<tr>
<td>6</td>
<td>1.00</td>
<td>0.571**</td>
<td>0.364**</td>
<td>0.407**</td>
<td>0.498**</td>
<td>0.407**</td>
<td>0.145</td>
<td>0.129</td>
<td>0.755**</td>
<td>0.229</td>
<td>0.056</td>
<td>0.024</td>
</tr>
<tr>
<td>7</td>
<td>1.00</td>
<td>0.498**</td>
<td>0.844**</td>
<td>0.484**</td>
<td>0.526**</td>
<td>0.407**</td>
<td>0.172**</td>
<td>0.109</td>
<td>0.789**</td>
<td>0.229</td>
<td>0.093</td>
<td>0.024</td>
</tr>
<tr>
<td>8</td>
<td>1.00</td>
<td>0.498**</td>
<td>0.844**</td>
<td>0.484**</td>
<td>0.526**</td>
<td>0.407**</td>
<td>0.172**</td>
<td>0.109</td>
<td>0.789**</td>
<td>0.229</td>
<td>0.093</td>
<td>0.024</td>
</tr>
<tr>
<td>9</td>
<td>1.00</td>
<td>0.498**</td>
<td>0.844**</td>
<td>0.484**</td>
<td>0.526**</td>
<td>0.407**</td>
<td>0.172**</td>
<td>0.109</td>
<td>0.789**</td>
<td>0.229</td>
<td>0.093</td>
<td>0.024</td>
</tr>
<tr>
<td>10</td>
<td>1.00</td>
<td>0.498**</td>
<td>0.844**</td>
<td>0.484**</td>
<td>0.526**</td>
<td>0.407**</td>
<td>0.172**</td>
<td>0.109</td>
<td>0.789**</td>
<td>0.229</td>
<td>0.093</td>
<td>0.024</td>
</tr>
<tr>
<td>11</td>
<td>1.00</td>
<td>0.498**</td>
<td>0.844**</td>
<td>0.484**</td>
<td>0.526**</td>
<td>0.407**</td>
<td>0.172**</td>
<td>0.109</td>
<td>0.789**</td>
<td>0.229</td>
<td>0.093</td>
<td>0.024</td>
</tr>
<tr>
<td>12</td>
<td>1.00</td>
<td>0.498**</td>
<td>0.844**</td>
<td>0.484**</td>
<td>0.526**</td>
<td>0.407**</td>
<td>0.172**</td>
<td>0.109</td>
<td>0.789**</td>
<td>0.229</td>
<td>0.093</td>
<td>0.024</td>
</tr>
</tbody>
</table>

*p < .05* (two-tailed)

*p < .01** (two-tailed)

The Motivation variables were identified by three factors using principal components analysis, with initial Eigenvalues greater than 1.0 and accounting for 72.01% of the variance (see Table 17). The items loaded as expected on Autonomous (Auto), Introjected (Intj), and Extrinsic (Ext) regulations of motivation (see Table 18). Each item had factor loadings of at least 0.55 on only one factor. One item in the Autonomous regulation factor (Mot_6) had communalities equal to 0.40. This factor structure confirmed previous research (Stupnisky et
al., 2018, 2019) on motivation regulation factors and confirmed the construct validity for this study.

Table 17

*Initial Eigenvalues, Percentages of Variance and Cumulative Percentages for Factors for 12 Motivation Items (N = 272)*

<table>
<thead>
<tr>
<th>Factor</th>
<th>Eigenvalue</th>
<th>% of Variance</th>
<th>Cumulative %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autonomous (Auto)</td>
<td>3.89</td>
<td>32.41</td>
<td>32.41</td>
</tr>
<tr>
<td>Introjected (Intj)</td>
<td>2.97</td>
<td>24.78</td>
<td>57.18</td>
</tr>
<tr>
<td>Extrinsic (Ext)</td>
<td>1.78</td>
<td>14.83</td>
<td>72.01</td>
</tr>
</tbody>
</table>

The reliability for the motivation regulation factors for the current study were similar to previous research (see Table 19). With the reliability and validity of the Motivation construct confirmed in this study, item parceling proceeded.

*Creation of Item Parcels*

Items for the Motivation factors were parcelled by calculating the mean of each cases’ responses within the factor. This resulted in parcelled scores for Autonomous Motivation regulation (Parc_Mot_Auto), Introjected Motivation regulation (Parc_Mot_Intj) and Extrinsic Motivation regulation (Parc_Mot_Ext) as presented in Table 20.
Table 18

Factor Loadings and Communalities for Varimax Rotated Three-Factor Solution for Motivation Items (N = 272)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Loadings</th>
<th>Communalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mot_2</td>
<td>0.90</td>
<td>0.69</td>
</tr>
<tr>
<td>Mot_3</td>
<td>0.90</td>
<td>0.82</td>
</tr>
<tr>
<td>Mot_1</td>
<td>0.83</td>
<td>0.81</td>
</tr>
<tr>
<td>Mot_4</td>
<td>0.75</td>
<td>0.58</td>
</tr>
<tr>
<td>Mot_5</td>
<td>0.67</td>
<td>0.49</td>
</tr>
<tr>
<td>Mot_6</td>
<td>0.61</td>
<td>0.40</td>
</tr>
<tr>
<td>Mot_8</td>
<td>0.94</td>
<td>0.87</td>
</tr>
<tr>
<td>Mot_7</td>
<td>0.92</td>
<td>0.90</td>
</tr>
<tr>
<td>Mot_9</td>
<td>0.89</td>
<td>0.82</td>
</tr>
<tr>
<td>Mot_11</td>
<td></td>
<td>0.90</td>
</tr>
<tr>
<td>Mot_10</td>
<td></td>
<td>0.84</td>
</tr>
<tr>
<td>Mot_12</td>
<td></td>
<td>0.83</td>
</tr>
</tbody>
</table>

Table 19

Reliability of Extrinsic Motivation Regulatory Scales

<table>
<thead>
<tr>
<th>Factor</th>
<th>Number of items</th>
<th>Stupnisky et al., 2018</th>
<th>Stupnisky et al., 2019</th>
<th>Current Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autonomous</td>
<td>6</td>
<td>0.80</td>
<td>0.92</td>
<td>0.87</td>
</tr>
<tr>
<td>Introjected</td>
<td>3</td>
<td>0.79</td>
<td>0.80</td>
<td>0.92</td>
</tr>
<tr>
<td>External</td>
<td>3</td>
<td>0.87</td>
<td>0.77</td>
<td>0.84</td>
</tr>
</tbody>
</table>
Table 20

Summary of Parceled Motivation Factors

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parc_Mot_Auto</td>
<td>6.00</td>
<td>0.88</td>
<td>-0.83</td>
<td>0.06</td>
</tr>
<tr>
<td>Parc_Mot_Intj</td>
<td>4.08</td>
<td>1.90</td>
<td>-0.11</td>
<td>-1.14</td>
</tr>
<tr>
<td>Parc_Mot_Ext</td>
<td>5.34</td>
<td>1.54</td>
<td>-0.78</td>
<td>-0.16</td>
</tr>
</tbody>
</table>

Note. N = 272. Parc_Mot_Auto = Autonomous regulation of motivation; Parc_Mot_Intj = Introjected regulation of motivation; Parc_Mot_Ext = External regulation of motivation.

Motivation items were measured on a seven-point Likert scale.

Implementation of Assessment Practices

By examining the assessment loop and cultures of assessment, several best practices for assessment were identified and summarized (see Table 21) to create a construct of Implementation of Assessment Practices (IAP). Because this construct was comprised of newly developed questions, the questions were shared with a small sample from the study population for feedback related to the order and wording of the questions. As a result of this review, one question was found to be dependent upon another question. The initial question (identify needed changes) was removed as the primary concern from the research was implementing changes based on assessment data. Respondents were asked to identify in which of the 12 best practices they participated through marking True for participating or False for not participating. There were no missing data among the 272 cases. The 12-item scale to assess Implementation of Assessment Practices exhibited good reliability (α = 0.81).
**Table 21**

*Summary of Assessment Best Practices*

<table>
<thead>
<tr>
<th>Best Practice</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty hold a common understanding of the learning outcomes</td>
<td>Dorime-Williams et al., 2022; Kezar, 2013; Maki, 2010; Ndoye &amp; Parker, 2010</td>
</tr>
<tr>
<td>Learning outcomes align with institutional mission and goals</td>
<td>Dorime-Williams et al., 2022; Kezar, 2013; Maki, 2010; Ndoye &amp; Parker, 2010</td>
</tr>
<tr>
<td>Have a planned approach to assessment activities</td>
<td>Banta, 2002; Weiner, 2009</td>
</tr>
<tr>
<td>Involve students in assessment activities</td>
<td>Banta, 2002</td>
</tr>
<tr>
<td>Include external stakeholders in assessment activities</td>
<td>Banta, 2002</td>
</tr>
<tr>
<td>Identify specific data collection approaches</td>
<td>Huba &amp; Freed, 2000; Pham, 2020</td>
</tr>
<tr>
<td>Collect data on student outcomes</td>
<td>Banta, 2002</td>
</tr>
<tr>
<td>Discuss assessment data with colleagues regularly</td>
<td>Ndoye &amp; Parker, 2010; Stevenson et al., 2017; Weiner, 2009</td>
</tr>
<tr>
<td>Share assessment outcomes broadly</td>
<td>Huba &amp; Freed, 2000</td>
</tr>
<tr>
<td>Implement changes based on assessment data</td>
<td>Banta &amp; Blaich, 2010; Fulcher et al., 2014, 2017</td>
</tr>
<tr>
<td>Review the assessment process regularly</td>
<td>Banta, 2002</td>
</tr>
<tr>
<td>Use professional development to increase understanding and skills</td>
<td>Banta, 2002</td>
</tr>
</tbody>
</table>

**Creation of Composite Score**

A composite score for Implementation of Assessment Practices (Comp_IAP) was created by summing the True (= 1) responses on each of twelve items in the construct for the 272 cases in the dataset. Each case had a score between 0 and 12. The variable Comp_IAP had a mean of 8.43 with a standard deviation of 2.96. The variable was skewed at -0.91 and had a kurtosis of 0.24.
Institutional Performance

Cameron (1978) was the first to attempt developing a scale to empirically assess organizational effectiveness in higher education. He (Cameron, 1978, 1986) and others (Kwan & Walker, 2003) acknowledged the difficulty of empirically assessing organizational effectiveness due to its contextual subjectivity. In a subsequent study, Cameron (1986) identified how various scales related differently within specific institutional contexts depending on institutional demographics, finances, environment, and culture. Kwan and Walker (2003) validated organizational effectiveness as a second-order factor from a sample of faculty in Hong Kong institutions of higher education. In doing so, they also confirmed seven independent dimensions of organizational effectiveness. From the results of that study, they concluded that Cameron’s (1978) nine scales were capable of reflecting higher education organizational effectiveness in specific contexts.

Ewell (1989) used a subset of twelve questions reflecting four factors from the 183-item Assessment of the Performance of Colleges and Universities to examine the impact of institutional culture on institutional effectiveness. The factors used were student educational satisfaction (SES), student academic development (SAD), student career development (SCD), and student personal development (SPD). The factors within the instrument were thoroughly reviewed to determine the scale validity and reliability by Krakower and Niwa (1985). Three of the four scales from the APCU survey, exclusive of student personal development, were chosen by Al Shraah et al. (2023) as exogenous variables to examine the role of academic program accreditation in developing students’ leadership and citizenship motivations in Jordanian institutions of higher education. From the student-focused dimensions in Kwan and Walker’s (2003) study, Student Educational Satisfaction and
Student Personal Development were combined to form one dimension within a second order student related factor.

Only the Student Educational Satisfaction (SES) scale was used in this study to evaluate the outcome variable, Institutional Performance, through the lens of student satisfaction leading to retention. Cameron (1978) defined Student Educational Satisfaction as the degree of students’ satisfaction with their educational experiences at the institution. The three items were worded so that they asked respondents to consider how dissatisfied students were with their educational experience at their institution. Therefore, the items were reverse-scored prior to analysis. The following sections confirm the reliability and validity of the scale as used in the current study before creating a composite score for analysis. Permission to use Cameron’s instrument is included in Appendix E.

Reliability & Validity

An exploratory factor analysis (EFA) was performed to confirm the factor reliability and validity in the current study using 272 cases. Principal components analysis was used. Normality was checked through skewness and kurtosis; no issues were identified. No linearity issues were identified from examining scatterplots (see Figure 11). One case was identified as a multivariate outlier ($\chi^2 [3] = 16.266, p < .001$). After reviewing the case, it was deemed to be acceptable and retained. No multicollinearity concerns were found by checking tolerance and VIF.

Factorability of \( R \) was assessed using a correlation matrix (see Table 22), Bartlett’s test of sphericity, and Kaiser-Meyer-Olkin measure of sampling adequacy (Tabachnick & Fidell, 2019). All of the correlations in the correlation matrix exceeded 0.30 and were statistically significant, suggesting that there is a relationship between the pairs of variables
ACADEMIC PROGRAM ASSESSMENT & STUDENT SATISFACTION

and that \( R \) was factorable. Bartlett’s test of sphericity was statistically significant \( (\chi^2 [3] = 493.87, p < .001) \) and the KMO value was 0.75. Based on all three indicators, \( R \) was determined to be factorable and the EFA proceeded.

**Figure 11**

*Scatterplot of Institutional Performance Items*

**Table 22**

*Correlation Matrix for Reversed Institutional Performance Variables*

<table>
<thead>
<tr>
<th></th>
<th>Perf_1_R</th>
<th>Perf_2_R</th>
<th>Perf_3_R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perf_1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perf_2</td>
<td>0.731**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Perf_3</td>
<td>0.734**</td>
<td>0.772**</td>
<td>1</td>
</tr>
</tbody>
</table>

** **\( p < .01 \) (2-tailed).
The EFA was performed in IBM SPSS Statistics (Version 29.0) using principal axis factoring with varimax rotation. The initial Eigenvalue (2.491) on the one identified factor explained 83.03% of the variance. Because only one factor was extracted, rotation could not be performed. No concerns were identified from the communalities or factor loadings on the items (see Table 23).

Table 23

<table>
<thead>
<tr>
<th></th>
<th>Factor Loading</th>
<th>Communality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perf_1_R</td>
<td>0.92</td>
<td>0.81</td>
</tr>
<tr>
<td>Perf_2_R</td>
<td>0.92</td>
<td>0.84</td>
</tr>
<tr>
<td>Perf_3_R</td>
<td>0.90</td>
<td>0.84</td>
</tr>
</tbody>
</table>

Al Shraah et al. (2023) found the SES scale had a Cronbach’s alpha of 0.77, above the 0.70 level suggested by Warner (2013) for sufficient reliability in social science research. Cronbach’s α of the Institutional Performance factor in this study was 0.90. From the results, it was determined that the scale was valid and reliable as used in this study and the creation of a composite score proceeded.

Composite Score

A composite score for Institutional Performance (Comp_Perf) was created by summing the three items in the construct. The Institutional Performance items were measured on a five-point Likert scale (1 = strongly disagree; 5 = strongly agree), although they were reverse scored prior to the reliability and validity analysis. The variable Comp_Perf had a mean of 10.76 with a standard deviation of 3.02. The skewness was -0.71 and the kurtosis was -0.14.
Data Analysis Procedures

To examine the relationships between faculty motivation, organizational learning, implementation of assessment practices, and institutional performance, structural equation modeling (SEM) was used. Kline (2023) highlighted six steps for SEM analysis: specification, identification, data screening, model analysis, respecification, and reporting. The following section will summarize how these steps were accomplished in this study.

Specification

Specification involved identifying the paths and hypothesized causality of the variables of interest and represented all the ways the variables were expected to relate to one another (Kline, 2023). The hypothesized structural model for this study (Figure 12), included manifest variables, represented by rectangular boxes, for Organizational Learning (Comp_OL), Implementation of Assessment Practices (Comp_IAP), Institutional Performance (Comp_Perf), Autonomous Regulation of Motivation (Parc_Mot_Auto), Introjected Regulation of Motivation (Parc_Mot_Intj), and Extrinsic Regulation of Motivation (Parc_Mot_Ext). Motivation (Mot) was a latent variable, or one that reflects multiple manifest variables, and was designated by an oval shape. Direct causal effects were represented by single arrowhead lines and covarying effects were represented by double arrowhead lines within the model (Kline, 2023).
Identification

Identification of a structural equation model assures that the model has sufficient known variables to unknown variables for the model to be empirically tested (Kline, 2023). There are two requirements for model identification: to assure that a model’s degrees of freedom is greater than zero ($df > 0$), or that the model was over-identified, so that correlations below the main diagonal in a correlation matrix can be calculated (Kline, 2023; Ullman, 2019).

In the hypothesized structural model (see Figure 12), there were six observed variables in the model represented by rectangular shapes. Therefore, $v = 6 (6 + 1) / 2 = 21$. 

Note. Parameters to be estimated are identified with *
The model had two error terms on endogenous variables and three error terms on exogenous variables that reflected a latent variable, one measured exogenous variable, one unmeasured covariance between organizational learning and motivation, four coefficients for direct effects on endogenous variables, and two unmeasured coefficients from a latent variable for a total of 13 free parameters. The model was therefore over-identified as $df = 21 - 13 = 8 > 0$, allowing the SEM procedures to continue.

**Measure Selection and Data Collection**

Structural equation modeling requires that strong measures be selected and the data are screened sufficiently (Kline, 2023). The measures selected for this study were described earlier in this chapter. The following data screening assumptions were checked before the analysis was run: outlier identification, normality and linearity of the variables, and collinearity and singularity. The results of the data screening process are highlighted in Chapter 4.

**Estimation**

Model estimation was performed using IBM SPSS Statistics (Version 29.0) with Amos. Although Ullman (2019) identified that the generalized least squares (GLS) method performed slightly better than maximum likelihood (ML) with normally distributed samples with less than 500 cases, Kline (2023) suggested that the GLS and ML methods are equally reliable. This study used the default ML method for estimation.

Estimation involved three steps: (a) evaluation of the model fit or the appropriateness of the model explaining the data; (b) interpretation of the parameter estimates; and (c) consideration of equivalent or near-equivalent models (Kline, 2023).
Evaluating Model Fit

Kline (2023) cautioned against setting a specific alpha value for determining statistical significance for SEM. He argued that doing so creates a false dichotomy for accepting or rejecting models without considering the full model and other statistics in a full analysis of the model fit. He suggested a seven-step procedure that relies on both the researcher’s knowledge of theory and statistical analysis. The first step is an analysis of the model chi-square with degrees of freedom. Next, an evaluation of both the global fit and local fit evidence is appropriate as there could be anomalies that are not statistically significant but greatly impact the model. Third, a report on and discussion of the model residuals and any patterns that may point to misspecification of the model is appropriate. Fourth, the researcher should consider the approximate fit indices that may signal that the model should be respecified. Finally, an argument as to why the model should be retained over other equivalent or near-equivalent models should be made. If the model is not retained, the researcher should explain the implications for the theory that was tested (Kline, 2023).

The goal of SEM was to seek a consistent model fit among the various indices (Ullman, 2019). Specific indices used included the model chi-square test ($\chi^2$), root mean square error of approximation (RMSEA), closeness of RMSEA fit probability (PCLOSE), comparative fit index (CFI), goodness-of-fit index (GFI), standardized root mean square residual (SRMR), and adjusted goodness-of-fit index (AGFI).

Hu and Bentler (1999) cautioned use of GFI and AGFI for evaluating model fit due to poor performance. They suggest the SRMR because it is the most sensitive to models with misspecified factor covariances and the CFI and RMSEA are most sensitive to models with misspecified factor loadings.
Model Chi-Square Test

The model chi-square test is a global fit statistic that allows the researcher to examine the model-data consistency to determine if the hypothesized model and the predicted covariance model are a good fit (Kline, 2023). A model will fail the model $\chi^2$ test if the test statistic is significant ($p < .05$). Included with the $\chi^2$ test statistic is the minimum discrepancy divided by degrees of freedom (CMIN/df); a result less than 3.0 is acceptable. Kline (2023) noted that a study with 200-300 cases is ideal for the model $\chi^2$ test index. However, there are also concerns about the model $\chi^2$ test, having an increased tendency to reject true models and that it is sensitive to nonnormal data. For these reasons, Kline (2023) suggests using multiple fit indices to evaluate a model. The indices used to evaluate the model fit in this study are summarized in Table 24.

Table 24

<table>
<thead>
<tr>
<th>Fit Statistic</th>
<th>Symbol</th>
<th>Cutoff Criterion for Fit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model chi square</td>
<td>$\chi^2$</td>
<td>$p \geq .05$</td>
</tr>
<tr>
<td>Minimum discrepancy/degrees of freedom</td>
<td>CMIN/df</td>
<td>$\leq 3.0$</td>
</tr>
<tr>
<td>Root Mean Square Error of Approximation</td>
<td>RMSEA</td>
<td>$\leq 0.06$</td>
</tr>
<tr>
<td>Closeness of RMSEA fit</td>
<td>PCLOSE</td>
<td>$\geq 0.50$</td>
</tr>
<tr>
<td>Comparative Fit Index</td>
<td>CFI</td>
<td>$\geq 0.96$</td>
</tr>
<tr>
<td>Adjusted goodness of fit index</td>
<td>AGFI</td>
<td>$&gt; 0.90$</td>
</tr>
<tr>
<td>Standardized Root Mean Square Residual</td>
<td>SRMR</td>
<td>$\leq 0.08$</td>
</tr>
<tr>
<td>Parsimony Adjusted Comparative Fit Index</td>
<td>PCFI</td>
<td>$\geq 0.50$</td>
</tr>
</tbody>
</table>
Root Mean Square Error of Approximation

The root mean square error of approximation (RMSEA) is an absolute fit index that identifies how well the model explains the data (Kline, 2023). It has been found to be sensitive to model misspecification (Byrne, 2016). The best result for this test is 0.0 and a result less than 0.06 is considered to be a good result (Hu & Bentler, 1999; Ullman, 2019). Along with the RMSEA statistic, a 90% interval is also provided by Amos, the upper limit should be less than 0.10. The RMSEA index is also sensitive to nonnormal data and is not recommended for samples with very low $df$ in small samples (Kline, 2023), neither of which is a concern in this study.

Comparative Fit Index

The comparative fit index (CFI) is an incremental index that compares the hypothesized model to a baseline model that assumes the endogenous and exogenous variable covariance as zero (Kline, 2023). In doing so, it compares the hypothesized model to the worst-case model. Hu and Bentler (1999) suggest a CFI greater than 0.95. To evaluate models with over 250 cases, they recommended a value of 0.96 or greater in combination with SRMR less than 0.09 to reduce Type I and Type II errors (Hu & Bentler, 1999).

Goodness of Fit Index

Another absolute fit index similar to the RMSEA is the goodness of fit index (GFI) and the adjusted goodness of fit index (AGFI). The AGFI estimates the proportion of variance in the sample covariance that is explained by the predicted covariance matrix (Kline, 2023). Higher values within the scale of 0.00 to 1.00 indicate a better fit of the data. Poorly fit data may result in a value less than 0.00 when the poor fit is extreme (Kline, 2023).
**Standardized Root Mean Square Residual**

The standardized root mean square residual (SRMR) is based on the residuals and a 0.00 on this index represents a perfect fit between the observed and predicted residuals (Kline, 2023). Hu and Bentler (1999) generally suggest a value below 0.08 but cautioned that one must consider both the index value and to look for noticeable variation in the residual matrix when evaluating this index.

**Parsimony Adjusted Comparative Fit**

Parsimony-adjusted fit indices compare the degrees of freedom in a model to the maximum number possible in the data (Kline, 2023). Byrne (2016) suggested parsimonious fit indices above 0.50 were acceptable.

**Respecification**

If the fit of the initial model is poor, modifications to the model can be made to improve fit, a process known as respecification (Ullman, 2019). Ullman (2019) suggested adding any parameters (model building) before removing unnecessary parameters (model trimming) and doing so individually rather than in groups between analyses.

Respecification is best handled according to modifications identified a priori (see Table 25) and with integrity to the conceptual framework developed from the literature review; this is known as theoretical respecification (Kline, 2023). Empirical respecification involves deleting or adding free parameters according to statistical criteria yet doing so in alignment with the theoretical foundation on which the initial model was built (Kline, 2023). Empirical respecification will be done based on standardized residual covariance matrix, modification indices, and related statistics.
A summary of changes to the initial model with rationale and justification for the retained model over equivalent models will be discussed in chapter four (Kline, 2023). Modifications to the model were evaluated using the chi-square difference test ($\Delta \chi^2$) and the estimated cross-validation index (ECVI).

**Table 25**

*Theoretical Respecification Options*

<table>
<thead>
<tr>
<th>Model</th>
<th>Possible modification(s)</th>
<th>$df_M$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hypothesized structural model</td>
<td>8</td>
</tr>
<tr>
<td>2</td>
<td>Manifest variables of Motivation Regulations may impact Organizational Learning and Implementation of Assessment Practices independently rather than through a single latent variable</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>Organizational Learning and Implementation of Assessment Practices covary to impact Institutional Performance</td>
<td>8</td>
</tr>
</tbody>
</table>

**Modification Indices and Related Statistics**

Modification indices (MI) help the researcher to identify possibly misidentified parameters within the current model that can be added for greater fit (Byrne, 2016). Paths with the greatest MI values were considered first; values less than 10.0 typically provide negligible improvements to model fit (Byrne, 2016). Expected parameter changes (EPC) are also provided but provided in absolute values and are difficult to interpret (Byrne, 2016). Finally, the maximum likelihood (ML) estimates were considered for model trimming (Kline, 2023). Paths with statistically significant ($p < .05$) values were considered for removal and improvement to the model fit only after model additions were completed (Ullman, 2019).
Standardized Residual Covariance Matrix

The standardized residual covariance matrix was examined to identify large values that may indicate modification is needed if the values deviate too far from 0 (Kline, 2023; Ullman, 2019). According to Byrne (2016), values greater than 2.58 are large and the corresponding variable interaction should be considered for modification.

Chi-Square Difference Test

The chi-square difference test ($\Delta \chi^2$) was used to examine the decrease in $\chi^2$ from the initial model to subsequent models (Kline, 2023; Ullman, 2019). If a subsequent, or nested, model increases in $\chi^2$ value, it was considered to be too constrained and a poor fit to the data whereas a decreased and statistically significant $\Delta \chi^2$ result indicates that the subsequent model is a better fit to the data (Kline, 2023). Statistical significance for the $\Delta \chi^2$ was computed in Microsoft Excel using the CHIDIST function (Heiser, 2005).

Estimated Cross Validation Index

The estimated cross-validation index (ECVI) represents the likelihood that the covariance matrix of the current sample would cross-validate with a different sample of the same size from the same population (Byrne, 2016). Among multiple models, the model with the smallest ECVI value is most likely to be replicated with a new sample from the same population (Byrne, 2016).

Limitations

As in any research project, there are limitations based on theoretical or practical constraints that arise from the researcher’s choices throughout the study. The method of volunteer sampling may have biased results of the study in that only faculty with an interest or positive perception of assessment may have responded (Remler & Van Ryzin, 2015). The
sample was also focused on faculty teaching at bachelor’s granting institution in Ohio, which may skew the data based on common expectations within that state. Finally, the reliance on faculty perceptions of institutional performance were only suggestive as perceptions can change easily and quickly (Ewell, 1989).

**Ethical Considerations**

This research was granted exempt approval by the researcher’s Institutional Review Board (study #IRB-2023-364; see Appendix A). There were few risks to participants in this study. The survey instrument did not collect name, institution, or location, so the chances of identifying respondents was extremely low (Remler & Van Ryzin, 2015). The survey software did not collect IP addresses of respondents. After downloading data from the Qualtrics application, the data were stored on an institutionally managed server in a drive accessible only to the researcher.

Consent of participants was gained through an ongoing process. Recruiting messages (see Appendix C) explained the study purpose and estimated length to complete the survey. Upon following the survey link included with the message, participants were provided additional details of the research project and had the opportunity to formally consent or not consent to participating in the study. Finally, once participants began the survey, they could exit the survey at any time by closing the browser window.

**Chapter Summary**

This chapter included a description of the methods and research design used to examine the relationships between organizational learning, faculty motivations, implementation of assessment practices, and institutional performance using structural equation modeling. The conceptual model on which this study is based was reviewed and the
hypothesized structural model was introduced with research questions. The sample was defined and selected measures were validated.
CHAPTER FOUR: RESULTS

The purpose of this study was to investigate the relationship between academic program assessment activities and perceived institutional performance in U.S. institutions of higher education. Structural equation modeling (SEM) was used in this study to examine the structure between organizational learning, motivation, the implementation of assessment practices, and institutional performance. The results of the qualitative study are summarized in the following chapter.

To examine the relationship of the variables, a hypothesized structural model (see Figure 13) and corresponding research questions were constructed from theory and prior research:

1. Does the hypothesized structural model for Organizational Learning, Faculty Motivation, Implementation of Assessment Practices, and Institutional Performance produce an estimated population covariance matrix that is consistent with the sample covariance matrix? If the data do not fit the model, can the model be improved?

2. How much of the variance in Institutional Performance can be explained by the combined effect of Motivation, Organizational Learning, and Implementation of Assessment Practices in the model?

3. What are the direct effects, indirect effects, and total effects among the variables?
To address the research questions, data were collected from a sample of faculty at U.S.-located institutions of higher education granting four-year degrees. Quantitative survey data were collected to measure faculty motivation (Stupnisky et al., 2018, 2019), organizational learning (Bontis et al., 2002), implementation of assessment practices, and institutional performance (Cameron, 1978, 1981, 1986) related to student satisfaction and explore the relationships among these variables.

**Statistical Assumptions**

Before conducting the SEM analysis, data were screened for missingness, careless responses, and reliability and validity of scales. Data were then parceled and composite scores created for analysis. Finally, data screening appropriate to SEM was conducted, including outlier identification, normality, linearity, collinearity and singularity.
Sample Size

A survey was administered to faculty at U.S. located four-year institutions that included questions related to the four constructs of organizational learning, motivation, implementation of assessment practices, and institutional performance. The survey included 79 items that were later condensed into parcels or composite scores for each construct. The dataset for analysis included 272 cases.

Kline (2023) recommended a sample size to follow the ratio, $N:q$ of 20:1 where $N$ is the number of cases and $q$ represents the number of model parameters requiring statistical estimates. The hypothesized structural model in Figure 13 had thirteen parameters that required statistical estimates. Therefore, according to Kline (2023), a sample size of $20 \times 13 = 260$ cases was needed for this study. The 272 cases available for this analysis was sufficient.

Missing Data

Missing data were considered prior to checking the scales and creating parceled and composite factor scores during the instrumentation procedures highlighted in Chapter Three. As a result, there were no missing data in the dataset used for SEM analysis ($N = 272$).

Outliers

One multivariate outlier was identified according to Mahalanobis Distance (MD) greater than the critical value of $\chi^2(6) = 22.458$, $p < .001$. After review of the case, it was determined to be an outlier and removed from analysis. Checking assumptions continued with 271 cases.
Normality

Multivariate normality is a required assumption for SEM (Kline, 2023). To check that the data were normally distributed, skewness and kurtosis were considered. All variables fell within the identified bands of normality with skewness less than the absolute value of 1.0 and kurtosis less than the absolute value of 3.0 (Kline, 2023). Multivariate normality was confirmed by examining P-P Plots. Therefore, no transformation was needed.

Table 26

<table>
<thead>
<tr>
<th>Variable</th>
<th>$M$</th>
<th>$SD$</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comp_OL</td>
<td>13.17</td>
<td>3.49</td>
<td>-0.33</td>
<td>-0.38</td>
</tr>
<tr>
<td>Parc_Mot_Auto</td>
<td>6.00</td>
<td>0.87</td>
<td>-0.83</td>
<td>0.07</td>
</tr>
<tr>
<td>Parc_Mot_Intj</td>
<td>4.08</td>
<td>1.90</td>
<td>-0.11</td>
<td>-1.13</td>
</tr>
<tr>
<td>Parc_Mot_Ext</td>
<td>5.36</td>
<td>1.52</td>
<td>-0.76</td>
<td>-0.22</td>
</tr>
<tr>
<td>Comp_IAP</td>
<td>8.43</td>
<td>2.96</td>
<td>-0.91</td>
<td>0.23</td>
</tr>
<tr>
<td>Comp_Perf</td>
<td>10.77</td>
<td>2.99</td>
<td>-0.70</td>
<td>-0.15</td>
</tr>
</tbody>
</table>

*Note.* Comp_OL = Organizational Learning; Parc_Mot_Auto = Autonomous regulation of motivation; Parc_Mot_Intj = Introjected regulation of motivation; Parc_Mot_Ext = External regulation of motivation; Comp_IAP = Implementation of Assessment Practices; Comp_Perf = Institutional Performance.

Linearity & Homoscedasticity

Structural equation modeling requires linear relationships among variables (Ullman, 2019). An Analysis of Variance (ANOVA) was performed in IBM SPSS Statistics (Version 29.0) for all parcel and composite latent construct variable pairs to test for deviation from
linearity. The deviation from linearity was acceptable ($p > .05$) for each variable pair and they were deemed to be linear relationships (see Table 27).

A scatterplot was examined to identify homoscedasticity (Kline, 2023). Because the standardized residuals showed consistent separation from the regression line (see Figure 14), the dataset was considered homoscedastic (Tabachnick & Fidell, 2019).

### Table 27

#### Summary of Linearity Analysis

<table>
<thead>
<tr>
<th>Pair of Variables</th>
<th>Deviation from Linearity (ANOVA)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$df$</td>
</tr>
<tr>
<td>Comp_OL &amp; Comp_Perf</td>
<td>264</td>
</tr>
<tr>
<td>Parc_Mot_Auto &amp; Comp_Perf</td>
<td>20</td>
</tr>
<tr>
<td>Parc_Mot_Intj &amp; Comp_Perf</td>
<td>17</td>
</tr>
<tr>
<td>Parc_Mot_Ext &amp; Comp_Perf</td>
<td>17</td>
</tr>
<tr>
<td>Comp_IAP &amp; Comp_Perf</td>
<td>11</td>
</tr>
</tbody>
</table>

*Note. N = 271. Comp_OL = Organizational Learning; Parc_Mot_Auto = Autonomous regulation of motivation; Parc_Mot_Intj = Introjected regulation of motivation; Parc_Mot_Ext = External regulation of motivation; Comp_IAP = Implementation of Assessment Practices; Comp_Perf = Institutional Performance.*

### Absence of Multicollinearity and Singularity

To identify collinearity in the data, linear regression for all pairs were examined and found to be within acceptable ranges of tolerance greater than 1.0 or variance inflation factor
(VIF) greater than 10.0 (Kline, 2023). The absence of multicollinearity was confirmed. The correlations, means, and standard deviations are summarized in Table 28.

**Table 28**

*Summary of the Correlation Matrix, Means, and Standard Deviations for the Variables of Interest*

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comp_OL</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parc_Mot_Auto</td>
<td>0.304**</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parc_Mot_Intj</td>
<td>0.050</td>
<td>0.142*</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parc_Mot_Ext</td>
<td>-0.055</td>
<td>-0.027</td>
<td>0.244**</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comp_IAP</td>
<td>0.505**</td>
<td>0.247**</td>
<td>.0100</td>
<td>-0.021</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Comp_Perf</td>
<td>0.482**</td>
<td>0.180**</td>
<td>-0.094</td>
<td>0.010</td>
<td>0.298**</td>
<td>1.000</td>
</tr>
</tbody>
</table>

\[
M = 13.17, 6.00, 4.08, 5.36, 8.43, 10.79
\[
SD = 3.49, 0.87, 1.90, 1.52, 2.96, 2.99
\]

*Note.* *N* = 271. Comp_OL = Organizational Learning; Parc_Mot_Auto = Autonomous regulation of motivation; Parc_Mot_Intj = Introjected regulation of motivation; Parc_Mot_Ext = External regulation of motivation; Comp_IAP = Implementation of Assessment Practices; Comp_Perf = Institutional Performance.

\( p < .01 ** \)
Figure 14

Scatterplot to Check Homoscedasticity

Data Analyses

To test the hypothesized structural model, SEM was performed using IBM SPSS Statistics (Version 29.0) with Amos and a dataset of $N = 271$. The dataset was created from responses to an online survey from faculty members at U.S. located four-year institutions of higher education. Three composite variables were created from the original dataset representing Organizational Learning (Comp_OL), the Implementation of Assessment Practices (Comp_IAP), and Institutional Performance (Comp_Perf). Three parcelled variables were created to represent autonomous regulation of faculty motivation (Parc_Mot_Auto), introjected regulation of faculty motivation (Parc_Mot_Intj), and extrinsic regulation of faculty motivation (Parc_Mot_Ext).
Maximum likelihood (ML) estimation was used. Maximum likelihood estimation was recommended for continuous unstandardized data (Kline, 2023). Based on the expected small sample size for SEM, both Kline (2023) and Ullman (2019) recommended choosing estimation techniques based on multiple factors, including the normality of the data and final sample size.

**Research Question 1: Model Fit**

The first research question of this study was to determine if the hypothesized structural model fit the data and if the model could be respecified to improve the model fit. Research question 1 read as follows:

1. Does the hypothesized structural model for Organizational Learning, Faculty Motivation, Implementation of Assessment Practices, and Institutional Performance produce an estimated population covariance matrix that is consistent with the sample covariance matrix? If the data do not fit the model, can the model be improved?

The following fit statistics were used in this study to evaluate model fit: model chi-square ($\chi^2$), the root mean square error of approximation (RMSEA), closeness of RMSEA fit (PCLOSE), comparative fit index (CFI), adjusted goodness of fit index (AGFI), standardized root mean square residual (SRMR), and the parsimony adjusted comparative fit index (PCFI). Cutoff criteria used in this study are summarized in Table 29 and were suggested by the Kline (2023) for the $\chi^2$, CMIN/df, and AGFI; Hu and Bentler (1999) for the RMSEA, PCLOSE, CFI, and SRMR; and Byrne (2016) for the PCFI. Statistical significance for the obtained values were evaluated at the alpha of 0.05.

If an estimated model is a poor fit to the data, it can be respecified by adding or deleting paths (Byrne, 2016; Kline, 2023; Ullman, 2019). With each modification, the
successive models were specified, identified, and estimated again (Kline, 2023). This study followed Byrne’s (2016) suggested statistics to guide respecification: the statistical significance of path coefficients, modification indices (MIs), the expected parameter change (EPC), and the standardized residual covariance matrix. Respecification based on empirical evidence was done only when it aligned with theory. Respecified models were evaluated using the model chi-square difference ($\Delta \chi^2$) and the Expected Cross-Validation Index (ECVI).
### Table 29

**Summary of Cutoff Criteria and Obtained Values to Assess Fit for the Hypothesized Structural Model (Model 1)**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Cutoff Criterion for Good Fit</th>
<th>Obtained Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>$df$</td>
<td>$&gt; 0$</td>
<td>7</td>
</tr>
<tr>
<td>$\chi^2$</td>
<td>$\leq df$</td>
<td>27.58</td>
</tr>
<tr>
<td>$p$</td>
<td>$\geq 0.05$</td>
<td>0.00</td>
</tr>
<tr>
<td>$\text{CMIN/df}$</td>
<td>$\leq 3.0$</td>
<td>3.94</td>
</tr>
<tr>
<td>$\text{RMSEA (90% CI)}$</td>
<td>$\leq 0.06 (0.00-0.06)$</td>
<td>0.10 (0.07-0.15)</td>
</tr>
<tr>
<td>$\text{PCLOSE}$</td>
<td>$\geq 0.50$</td>
<td>0.01</td>
</tr>
<tr>
<td>$\text{CFI}$</td>
<td>$\geq 0.96$</td>
<td>0.90</td>
</tr>
<tr>
<td>$\text{AGFI}$</td>
<td>$&gt; 0.90$</td>
<td>0.91</td>
</tr>
<tr>
<td>$\text{SRMR}$</td>
<td>$\leq 0.08$</td>
<td>0.06</td>
</tr>
<tr>
<td>$\text{PCFI}$</td>
<td>$\geq 0.50$</td>
<td>0.42</td>
</tr>
<tr>
<td>$\text{ECVI (90% CI)}$</td>
<td>--</td>
<td>0.206 (0.16-0.28)</td>
</tr>
</tbody>
</table>

*Note. N = 271. df = model degrees of freedom; CMIN/df = Minimum Discrepancy per degrees of freedom; RMSEA = Root Mean Square Error of Approximation; CI= Confidence Interval; PCLOSE = $p$-value for the RMSEA closeness of fit index; CFI = Comparative Fit Index; AGFI = Adjusted Goodness of Fit Index; SRMR = Standardized Root Mean Square Residual; PCFI = Parsimony Adjusted Comparative Fit Index; ECVI = Expected Cross-Validation Index.*
Possible model respecifications were identified in Chapter Three (see Table 30) as a way to prevent the impression of model hacking (Kline, 2023). The a priori options were developed in alignment with theory and guided respecification of the initial model, if also aligned with suggestions for model building and model trimming options.
Table 30

*Theoretical Respecification Options*

<table>
<thead>
<tr>
<th>Model</th>
<th>Possible modification(s)</th>
<th>dfM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hypothesized structural model</td>
<td>8</td>
</tr>
<tr>
<td>2</td>
<td>Manifest variables of Motivation Regulations may impact Organizational Learning and Implementation of Assessment Practices independently rather than through a single latent variable</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>Organizational Learning and Implementation of Assessment Practices covary to impact Institutional Performance</td>
<td>8</td>
</tr>
</tbody>
</table>

**Hypothesized Structural Model (Model 1)**

The hypothesized structural model was recursive and identified. The ML estimation process converged for the hypothesized structural model and the solution was admissible. In reviewing the fit statistics in Table 29, it was determined that the overall fit of Model 1 was poor. The $\chi^2$ statistic was significant ($p = 0.00$) and the exact fit hypothesis was rejected, meaning that Model 1 was inconsistent with the covariance matrix (Kline, 2023). Each of the obtained values for this model, except for the SRMR and AGFI, failed to meet the established cutoff criteria. The SRMR was 0.06, less than the 0.08 cutoff, suggesting that observed and predicted covariances agreed that the data fit the model. The AGFI was 0.91, greater than the cutoff of 0.90, suggesting the model was a good fit.

Only one pair of variables, Parc_Mot_Intj and Parc_Mot_Auto, were identified in the standardized residual covariance matrix (Table 31) as being significant indicated by a value greater than 2.58 (Byrne, 2016).
Table 31

*Standardized Residual Covariance Matrix for the Hypothesized Structural Model (Model 1)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Comp_OL</td>
<td>0.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Comp_IAP</td>
<td>0.000</td>
<td>0.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Comp_Perf</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Parc_Mot_Ext</td>
<td>-0.783</td>
<td>-0.251</td>
<td>0.223</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Parc_Mot_Intj</td>
<td>-0.279</td>
<td>0.724</td>
<td>-2.096</td>
<td>4.071</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>6. Parc_Mot_Auto</td>
<td>0.016</td>
<td>-0.061</td>
<td>0.437</td>
<td>-0.189</td>
<td>0.016</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Note. N = 271. Bold items are greater than 2.58 and statistically significant. Comp_OL = Organizational Learning; Parc_Mot_Auto = Autonomous regulation of motivation; Parc_Mot_Intj = Introjected regulation of motivation; Parc_Mot_Ext = External regulation of motivation; Comp_IAP = Implementation of Assessment Practices; Comp_Perf = Institutional Performance.

With the overall model fit for Model 1 deemed poor, modifications were considered to improve the overall fit. As suggested by Byrne (2016), consideration was first given to paths that could be added to the model before consideration of removing paths. A review of MIs for Model 1 (see Table 32) indicated that adding a direct effect from Parc_Mot_Ext to Parc_Mot_Intj and from Parc_Mot_Intj to Parc_Mot_Ext would improve the overall fit by similar amounts, which was congruent with the significant standardized residuals shown in Table 31. The errors between these two variables (e2 and e3) were also suggested to covary based on a high MI.
Table 32

Modification Indices (MI) and Expected Parameter Changes (EPC) for the Hypothesized Structural Model (Model 1)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>MI</th>
<th>EPC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Paths</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comp_Perf ← Parc_Mot_Intj</td>
<td>5.371</td>
<td>-0.194</td>
</tr>
<tr>
<td>Parc_Mot_Ext ← Parc_Mot_Intj</td>
<td>16.579</td>
<td>0.198</td>
</tr>
<tr>
<td>Parc_Mot_Intj ← Comp_Perf</td>
<td>4.470</td>
<td>-0.084</td>
</tr>
<tr>
<td>Parc_Mot_Intj ← Parc_Mot_Ext</td>
<td>17.291</td>
<td>0.314</td>
</tr>
<tr>
<td><strong>Covariances</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e2 ↔ e5</td>
<td>5.796</td>
<td>-0.717</td>
</tr>
<tr>
<td>e2 ↔ e3</td>
<td>17.299</td>
<td>0.721</td>
</tr>
</tbody>
</table>

Note. *N* = 271. Comp_OL = Organizational Learning; Parc_Mot_Auto = Autonomous regulation of motivation; Parc_Mot_Intj = Introjected regulation of motivation; Parc_Mot_Ext = External regulation of motivation; Comp_IAP = Implementation of Assessment Practices; Comp_Perf = Institutional Performance.

The highest MI value and suggested path addition was from Parc_Mot_Intj to Parc_Mot_Ext (MI = 17.29; EPC = 0.031). According to Deci and Ryan (2000b) the four extrinsic motivation regulations (external, introjected, identified, and integrated) are considered to follow a continuum (see Figure 15) of greater internationalization of the locus of control from extrinsic regulation to integrated regulation. For both external regulation and introjected regulation, the individual’s behavior is controlled by external expectations; the difference between the regulations is that individuals guided by extrinsic regulation have an external source of control such as rewards or threats of punishment whereas those motivated
by an introjected regulation have an internal locus of control such as feelings of guilt or shame (Deci & Ryan, 2000b). However, Stupnisky et al. (2018, 2019) used each regulation as measured factors in previous research rather than through a latent variable as in Model 1. Additionally, Stupnisky et al. (2018, 2019) found in various studies that both controlled regulations had no influence on the outcome variables.

**Figure 16**

*Self-Determination Theory's Taxonomy of Motivation*

<table>
<thead>
<tr>
<th>Motivation</th>
<th>Amotivation</th>
<th>Extrinsic Motivation</th>
<th>Intrinsic Motivation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulatory Style</td>
<td>External Regulation</td>
<td>Introjected Regulation</td>
<td>Identified Regulation</td>
</tr>
<tr>
<td>Perceived Locus of Causality</td>
<td>Impersonal</td>
<td>External</td>
<td>Somewhat External</td>
</tr>
</tbody>
</table>


https://doi.org/10.1016/j.cedpsych.2020.101860

To further explore the possible modification, factor loadings of the measured variables (Parc_Mot_Ext, Parc_Mot_Intj, and Parc_Mot_Auto) on the latent variable (Motivation) were examined (see Table 33). Parc_Mot_Ext had a low negative standardized factor loading (= -0.019) while Parc_Mot_Intj and Parc_Mot_Auto had positive values. Hair et al. (2010) suggested that standardized loadings in CFA should be at least 0.50 for construct validity; 0.70 or higher is ideal. With both positive and negative indicators on the latent
variable, uncertainty is realized in the full model and decreased replication opportunities (Rigdon et al., 2019). Based on theoretical and empirical reasons, this suggestion was not implemented.

Table 33

**Standardized Factor Loadings on Latent Variable Motivation in Model 1**

<table>
<thead>
<tr>
<th>Path</th>
<th>Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parc_Mot_Ext ← Motivation</td>
<td>-0.019</td>
</tr>
<tr>
<td>Parc_Mot_Intj ← Motivation</td>
<td>0.176</td>
</tr>
<tr>
<td>Parc_Mot_Auto ← Motivation</td>
<td>0.797</td>
</tr>
</tbody>
</table>

*Note.* Parc_Mot_Auto = Autonomous regulation of motivation; Parc_Mot_Intj = Introjected regulation of motivation; Parc_Mot_Ext = External regulation of motivation.

The second MI for Model 1 was to add a direct path in the opposite direction, from Parc_Mot_Ext to Parc_Mot_Intj. For the same reasons as have been explored, this suggestion was also not implemented. Finally, the covariance between the error terms on Parc_Mot_Ext and Parc_Mot_Intj (e2 and e3) was not implemented based on the same theoretical reasoning. The small factor loadings of Parc_Mot_Ext and Parc_Mot_Intj found in Model 1 indicated that they were not an influence or possibly a negative influence on the rest of the model. To address items with low loadings, deletion can be considered (Hair et al., 2010).

Therefore, based on the poor fit of Model 1 and the theoretical and statistical concerns with the proposed modifications, Alternate Model 1 was created in line with options identified a priori, specifically, option 2 in Table 30. Changes to Model 1 included removing both measured variables of Parc_Mot_Ext and Parc_Mot_Intj and the related parameters and
errors. Because only one indicator remained for the latent variable, Motivation was also removed from Alternate Model 1. Direct paths from the remaining Parc_Mot_Auto variable to both Comp_OL and Comp_IAP were added, along with an error term (e6) to Comp_OL because it became an endogenous variable. A summary of changes from the hypothesized structural model to Alternate Model 1 are presented in Figure 16. Alternate Model 1 contained four observed variables, four error measurements, and five parameters (see Figure 16). There were 9 free parameters and $df$ was 1.

Figure 17

Changes from Hypothesized Structural Model to Alternate Model 1

Note. Greyed items were removed. Dashed items were added.
Alternate Model 1

The ML estimation process converged for Alternate Model 1 (Figure 17) and the solution was admissible. The exact-fit hypothesis for Alternate Model 1 was retained because the model did not fail the $\chi^2$ test ($\chi^2 [1] = 0.282, p = 0.595$), meaning that Alternate Model 1 was consistent with the covariance matrix (Kline, 2023). In reviewing the remaining fit statistics in Table 34, it was determined that Alternate Model 1 represented a good fit to the data. Nearly all of the obtained values for fit statistics of this model were acceptable: $\text{CFI} = 1.00$, $\text{SRMR} = 0.009$, $\text{RMSEA} = 0.000$ with a 90% CI of 0.00-0.13, and the $\text{AGFI} = 0.995$. The PCLOSE statistic of RMSEA was 0.70, an indication that the model was approaching close fitting. The model PCFI statistic ($= 0.17$) did not meet the cutoff criteria.

Figure 18
Alternate Model 1 with Standardized (Unstandardized) Direct Effects and $R^2$

Note: $p < .001$ *** for unstandardized estimates only.
### Table 34

**Summary of Cutoff Criteria and Obtained Values to Assess Fit for Alternate Model 1**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Cutoff Criterion for Good Fit</th>
<th>Obtained Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>$df$</td>
<td>$&gt; 0$</td>
<td>1</td>
</tr>
<tr>
<td>$\chi^2$</td>
<td>$\leq df$</td>
<td>0.28</td>
</tr>
<tr>
<td>$p$</td>
<td>$\geq 0.05$</td>
<td>0.60</td>
</tr>
<tr>
<td>CMIN/df</td>
<td>$\leq 3.0$</td>
<td>0.28</td>
</tr>
<tr>
<td>RMSEA (90% CI)</td>
<td>$\leq 0.06$ (0.00-0.06)</td>
<td>0.00 (0.00-0.13)</td>
</tr>
<tr>
<td>PCLOSE</td>
<td>$\geq 0.50$</td>
<td>0.70</td>
</tr>
<tr>
<td>CFI</td>
<td>$\geq 0.96$</td>
<td>1.00</td>
</tr>
<tr>
<td>AGFI</td>
<td>$&gt; 0.90$</td>
<td>0.995</td>
</tr>
<tr>
<td>SRMR</td>
<td>$\leq 0.08$</td>
<td>0.01</td>
</tr>
<tr>
<td>PCFI</td>
<td>$\geq 0.50$</td>
<td>0.17</td>
</tr>
<tr>
<td>ECVI (90% CI)</td>
<td>--</td>
<td>0.07 (0.07-0.09)</td>
</tr>
</tbody>
</table>

*Note. $N = 271$. df = model degrees of freedom; CMIN/df = Minimum Discrepancy per degrees of freedom; RMSEA = Root Mean Square Error of Approximation; CI= Confidence Interval; PCLOSE = $p$-value for the RMSEA closeness of fit index; CFI = Comparative Fit Index; AGFI = Adjusted Goodness of Fit Index; SRMR = Standardized Root Mean Square Residual; PCFI = Parsimony Adjusted Comparative Fit Index; ECVI = Expected Cross-Validation Index.*

The difference in model fit from Model 1 to Alternate Model 1 was statistically significant ($\Delta \chi^2_{1-A1} = 27.3[6]$, $p < .001$) indicating Alternate Model 1 was a better fit to the data than was Model 1. Additionally, the ECVI value for Alternate Model 1 (ECVI = 0.07) was lower than that for Model 1 (ECVI = 0.206). Therefore, changes to create Alternate Model 1 significantly improved the model fit.
A review of the off-diagonal elements in the standardized residual covariance matrix for Alternate Model 1 (see Table 35) found no statistically significant differences between the estimated population covariance matrix and the sample covariance matrix.

**Table 35**

*Standardized Residual Covariance Matrix for Alternate Model 1*

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Comp_OL</td>
<td>0.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Comp_IAP</td>
<td>0.000</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Comp_Perf</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>4. Parc_Mot_Auto</td>
<td>0.000</td>
<td>0.000</td>
<td>0.434</td>
<td>0.000</td>
</tr>
</tbody>
</table>

With no MIs produced for Alternate Model 1, an examination of paths that could be deleted from the model followed. The unstandardized ML estimates for the paths included with Alternate Model 1 were examined to identify if any were nonsignificant, as suggested by Byrne (2016). As shown in Table 36, two paths had ML estimates that were nonsignificant: Parc_Mot_Auto to Comp_IAP ($p = 0.060$) and Comp_IAP to Comp_Perf ($p = 0.236$). Removal of this path in the model did not align with the theory presented. Therefore, Alternate Model 1 was accepted as the model with the best fit to the data. A comparison of both models is summarized in Table 37.
Table 36

Unstandardized Maximum Likelihood (ML) Parameter Estimates of Path Coefficients for
Alternate Model 1

<table>
<thead>
<tr>
<th>Parameter</th>
<th>B</th>
<th>SE</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comp_OL ← Parc_Mot_Auto</td>
<td>1.223</td>
<td>0.233</td>
<td>***</td>
</tr>
<tr>
<td>Comp_IAP ← Comp_OL</td>
<td>0.402</td>
<td>0.046</td>
<td>***</td>
</tr>
<tr>
<td>Comp_IAP ← Parc_Mot_Auto</td>
<td><strong>0.351</strong></td>
<td>0.187</td>
<td>0.060</td>
</tr>
<tr>
<td>Comp_Perf ← Comp_IAP</td>
<td>0.074</td>
<td>0.062</td>
<td>0.236</td>
</tr>
<tr>
<td>Comp_Perf ← Comp_OL</td>
<td>0.380</td>
<td>0.053</td>
<td>***</td>
</tr>
</tbody>
</table>

Note. N = 271. Items in bold are statistically significant. Comp_OL = Organizational Learning; Parc_Mot_Auto = Autonomous regulation of motivation; Comp_IAP = Implementation of Assessment Practices; Comp_Perf = Institutional Performance.

p < .001 ***
### Table 37

**Summary of Cutoff Criteria and Obtained Values for Selected Fit Indices Used to Assess Model Fit**

<table>
<thead>
<tr>
<th>Fit statistic</th>
<th>Cutoff criteria for good fit</th>
<th>Obtained values</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>( df )</td>
<td>( &gt; 0 )</td>
<td>7</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>( \chi^2 )</td>
<td>( \leq df )</td>
<td>27.58</td>
<td>0.28</td>
<td></td>
</tr>
<tr>
<td>( p )</td>
<td>( \geq 0.05 )</td>
<td>0.00</td>
<td>0.60</td>
<td></td>
</tr>
<tr>
<td>CMIN/( df )</td>
<td>( \leq 3.0 )</td>
<td>3.94</td>
<td>0.28</td>
<td></td>
</tr>
<tr>
<td>RMSEA (90% CI)</td>
<td>( \leq 0.06 )</td>
<td>(0.00-0.10)</td>
<td>(0.07-0.15)</td>
<td>(0.00-0.13)</td>
</tr>
<tr>
<td>PCLOSE</td>
<td>( \geq 0.50 )</td>
<td>0.01</td>
<td>0.70</td>
<td></td>
</tr>
<tr>
<td>CFI</td>
<td>( \geq 0.96 )</td>
<td>0.90</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>AGFI</td>
<td>( &gt; 0.90 )</td>
<td>0.91</td>
<td>0.995</td>
<td></td>
</tr>
<tr>
<td>SRMR</td>
<td>( \leq 0.08 )</td>
<td>0.06</td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>PCFI</td>
<td>( \geq 0.50 )</td>
<td>0.42</td>
<td>0.17</td>
<td></td>
</tr>
<tr>
<td>ECVI (90% CI)</td>
<td>--</td>
<td>0.21</td>
<td>0.07</td>
<td>(0.16-0.28)</td>
</tr>
</tbody>
</table>

**Note.** \( N = 271 \). \( df \) = model degrees of freedom; CMIN/\( df \) = Minimum Discrepancy per degrees of freedom; RMSEA = Root Mean Square Error of Approximation; CI= Confidence Interval; PCLOSE = \( p \)-value for the RMSEA closeness of fit index; CFI = Comparative Fit Index; AGFI = Adjusted Goodness of Fit Index; SRMR = Standardized Root Mean Square Residual; PCFI = Parsimony Adjusted Comparative Fit Index; ECVI = Expected Cross-Validation Index.
Table 38

Unstandardized and Standardized Maximum Likelihood Parameter Estimates (Path Coefficients and Disturbance Variances) for Final Model (Alternate Model 1)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Path Coefficients</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parc_Mot_Auto → Comp OL</td>
<td>1.223***</td>
<td>0.233</td>
<td>0.304</td>
</tr>
<tr>
<td>Parc_Mot_Auto → Comp_IAP</td>
<td>0.351</td>
<td>0.187</td>
<td>0.103</td>
</tr>
<tr>
<td>Comp OL → Comp_IAP</td>
<td>0.402***</td>
<td>0.046</td>
<td>0.474</td>
</tr>
<tr>
<td>Comp_IAP → Comp_Perf</td>
<td>0.074</td>
<td>0.062</td>
<td>0.073</td>
</tr>
<tr>
<td>Comp OL → Comp_Perf</td>
<td>0.380***</td>
<td>0.053</td>
<td>0.445</td>
</tr>
<tr>
<td>Disturbance variances</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e4</td>
<td>6.419***</td>
<td>0.552</td>
<td></td>
</tr>
<tr>
<td>e5</td>
<td>6.788***</td>
<td>0.584</td>
<td></td>
</tr>
<tr>
<td>e6</td>
<td>11.035***</td>
<td>0.950</td>
<td></td>
</tr>
</tbody>
</table>

Note. Items in bold are statistically significant.

p < .001 ***

Summary

The hypothesized structural model (Model 1) for Organizational Learning (Comp OL), Faculty Motivation (Motivation), Implementation of Assessment Practices (Comp_IAP), and Institutional Performance (Comp_Perf) did not result in an estimated population covariance matrix that was consistent with the sample covariance matrix. Therefore, a non-nested model with an alternate structure was specified by removing two of the three regulations of motivation (Parc_Mot_Ext and Parc_Mot_Intj) and the latent variable Motivation. The non-nested model (Alternate Model 1) did result in an estimated covariance matrix that was consistent with the sample covariance matrix according to the fit statistics.
Alternate Model 1 was consistent with previous research that showed external and introjected regulations of motivation of faculty had no influence on their related teaching activities such as collaborative learning (Stupnisky et al., 2018). This study examined the effects of the regulations of motivation in faculty related to assessment and found similar outcomes as Stupnisky et al. As with other teaching-related activities, the external and introjected regulations of motivation had at best little effect and at worst a negative effect on faculty participation. Therefore, Alternate Model 1 was a better fitting model based on both empirical and theoretical reasons and was provisionally accepted as the final model (see Figure 18). The syntax for the hypothesized structural model and the final model are included in Appendix F.

Figure 19

*Final Model with Standardized (Unstandardized) Direct Effects and $R^2$*

Note. $p < .001$ *** for unstandardized estimates only.
Research Question 2: Variance Explained

The second research question was designed to identify the amount of variance in the dependent variable accounted for by the combined effect of the independent variables. Research question two was:

2. How much of the variance in Institutional Performance can be explained by the combined effect of Motivation, Organizational Learning, and Implementation of Assessment Practices in the model?

IBM SPSS Statistics (Version 29.0) with Amos was used to produce the squared multiple correlation ($R^2$), or the proportion of variance explained for each endogenous variable included in the final model (see Table 39). Based on its $R^2$ value, 23.6% of the variance in Comp_Perf was explained by the combined effects of Parc_Mot_Auto, Comp OL, and Comp_IAP. This was a weak positive relationship with 76.4% of the variance left unexplained.

Table 39

<table>
<thead>
<tr>
<th>Variable</th>
<th>$R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comp OL</td>
<td>0.092</td>
</tr>
<tr>
<td>Comp_IAP</td>
<td>0.265</td>
</tr>
<tr>
<td>Comp_Perf</td>
<td>0.236</td>
</tr>
</tbody>
</table>

Note. Comp OL = Organizational Learning; Comp_IAP = Implementation of Assessment Practices; Comp_Perf = Institutional Performance.
Research Question 3: Direct, Indirect, and Total Effects

The final research question was designed to examine the nature of the relationships among the variables by analyzing the direct, indirect and total effects. The specific question was:

3. What are the direct effects, indirect effects, and total effects among the variables?

Standardized direct, indirect, and total effects were obtained from the ML estimation output using IBM SPSS Statistics (Version 29.0) with Amos to examine the direct effects, indirect effects and total effects (see Table 40). The total effect of Comp_Ol on Comp_Perf was $\beta = 0.479$ with $\beta = 0.445$ representing the direct effect and $\beta = 0.035$ representing the indirect effect from Comp_Ol to Comp_IAP to Comp_Perf. The direct effect of Comp_IAP on Comp_Perf was $\beta = 0.073$. The indirect effect of Parc_Mot_Auto on Comp_Perf was $\beta = 0.153$. By removing two variables, Parc_Mot_Ext and Parc_Mot_Intj, from the final model, no effects were detected from them.
Table 40

Standardized Direct, Indirect, and Total Effects of Predictor Variables on Endogenous Variables for Final Model

<table>
<thead>
<tr>
<th>Endogenous Variable</th>
<th>Predictor Variable</th>
<th>Direct Effect</th>
<th>Indirect Effect</th>
<th>Total Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comp_OL</td>
<td>Parc_Mot_Auto</td>
<td>0.304</td>
<td>--</td>
<td>0.304</td>
</tr>
<tr>
<td>Comp_IAP</td>
<td>Parc_Mot_Auto</td>
<td>0.103</td>
<td>0.144</td>
<td>0.247</td>
</tr>
<tr>
<td>Comp_IAP</td>
<td>Comp_OL</td>
<td>0.474</td>
<td>--</td>
<td>0.474</td>
</tr>
<tr>
<td>Comp_Perf</td>
<td>Parc_Mot_Auto</td>
<td>--</td>
<td>0.153</td>
<td>0.153</td>
</tr>
<tr>
<td>Comp_Perf</td>
<td>Comp_OL</td>
<td>0.445</td>
<td>0.035</td>
<td>0.479</td>
</tr>
<tr>
<td>Comp_Perf</td>
<td>Comp_IAP</td>
<td>0.073</td>
<td>--</td>
<td>0.073</td>
</tr>
</tbody>
</table>

Note. Comp_OL = Organizational Learning; Parc_Mot_Auto = Autonomous regulation of motivation; Comp_IAP = Implementation of Assessment Practices; Comp_Perf = Institutional Performance.

Summary

In summary, an SEM analysis and results were detailed in Chapter Four. The initial hypothesized structural model was not a good fit to the data. The revised model, Alternate Model 1, produce an estimated population covariance matrix consistent with the sample covariance matrix. The respecified model had very good fit according to the fit indices used in this study. In the provisionally retained final model (Alternate Model 1), 23.6% of the variance in Comp_Perf was explained by combined effects of Parc_Mot_Auto, Comp_OL, and Comp_IAP. Comp_OL had a moderate effect on Comp_Perf while Comp_IAP had a small effect on Comp_Perf.
CHAPTER FIVE: DISCUSSION

The purpose of this study was to investigate the relationship between academic program assessment activities and perceived institutional performance in U.S. institutions of higher education. Using a pragmatic perspective, this research study was designed to identify solutions, inform practice, and promote change (Dewey 1915/1997; Saunders et al., 2012) in assessment practices at higher education institutions in the United States. Structural equation modeling (SEM) and IBM SPSS Statistics (Version 29.0) with Amos were used in this study to examine a proposed structure between faculty motivation, organizational learning, implementation of assessment practices, and institutional performance. The modifications from the hypothesized to the final model are included in Figure 20. Faculty teaching at U.S.-located four-year institutions of higher education were the population studied. Three research questions were investigated:

1. Does the hypothesized structural model for Organizational Learning, Faculty Motivation, Implementation of Assessment Practices, and Institutional Performance produce an estimated population covariance matrix that is consistent with the sample covariance matrix? If the data do not fit the model, can the model be improved?

2. How much of the variance in Institutional Performance can be explained by the combined effect of Motivation, Organizational Learning, and Implementation of Assessment Practices in the model?
3. What are the direct effects, indirect effects, and total effects among the variables?

**Figure 20**

*Changes from Hypothesized Structural Model to Model 1*

In this chapter, findings from the study will be delineated along with limitations to those findings. Recommendations for future practice and research will also be presented.

**Discussion of Findings**

The current study was designed to empirically investigate the assumed relationship between academic program assessment activities and institutional performance. Based on the results of this study, the implementation of assessment practices has a weak positive relationship to institutional performance. The implementation of assessment best practices by
faculty does not make as substantial an impact on institutional performance as does the process of organizational learning. The main impact on institutional performance is through the social learning process that occurs among faculty in the academic programs during the process of closing the loop. Finally, faculty who are autonomously motivated are more likely to participate in assessment practices and organizational learning activities than those who do so only out of obligation to themselves or others, including the organization. External and Introjected Regulations of Motivation were found to have no calculable impact on the variance of Institutional Performance in this study.

The variance explained by the combined effect of Autonomous Regulation of Motivation, Organizational Learning, and the Implementation of Assessment Practices on Institutional Performance was 23.6%, indicating a weak positive relationship. The unexplained variance in the outcome variable was 76.4%. Doherty et al. (2013) suggested that unexplained variance in studies such as the current one includes individual behavioral differences. While this study considered motivational differences, other differences may include faculty career goals and experience among other individual differences. In considering institutional performance, specifically related to student educational satisfaction, factors such as distance from home; non-academic experiences such as residence life, athletics, or student activities; and cost of the education could also account for variability in institutional performance (Doherty et al., 2013). In the following discussion, noteworthy findings will be presented from the data analysis and literature review.

**Implementation of Assessment Practices**

The assessment best practices presented on the left side of Figure 21 and reviewed in this study were primarily the logistical and procedural aspects of assessment that institutional
leaders expect faculty to compete related to academic programs. The assessment best practices included articulating learning outcomes, identifying assessment measures, and developing learning experiences (Huba & Freed, 2000; Maki, 2010; Suskie, 2009, 2014). While this research identified that these aspects are beneficial to institutional performance, simply completing these logistical and procedural practices are insufficient to improve institutional performance.

**Figure 21**

*Maki’s Assessment Loop & Dixon’s Organizational Learning Cycle*

---

Multiple researchers have identified the gap in assessment for learning improvement efforts as a result of not closing the loop (Banta & Blaich, 2010; Dorime-Williams et al., 2022; Fulcher et al., 2017). Smith et al. (2015) found that assessment publications, including accreditor standards, are vague and provide fewer details about closing the loop than the first
three steps in the assessment loop. Closing the loop strategies could include completing the organizational learning cycle, as suggested in Chapter Two and highlighted on the right side of Figure 21.

**Organizational Learning**

Organizational learning is the intentional use and cumulative result of individual-, group-, and organizational-level learning that results in the non-human aspects of an organization, such as structures, policies, and espoused or in-use procedures to continuously transform and accomplish the work of the organization (Crossan et al., 1999; Dixon, 1994; Schein, 2017). The direct effects of organizational learning on institutional performance (0.479) were six times greater than the effects of the implementation of assessment practices on institutional performance (0.073). This result suggested that activities related to organizational learning, such as described by Dixon (1994), were more influential than the implementation of assessment best practices in affecting institutional performance. The dialogical process of organizational learning within the assessment process drives institutional performance in U.S.-located institutions of higher education and is assumed within the final step of Maki’s (2010) assessment loop, “closing the loop” (see Figure 21).

Crossan et al. (1999) and Dixon (1994) identified organizational learning as the process of constructing and reconstructing knowledge. Learning begins with an impetus of new knowledge. When that impetus is identified as incongruence between the expected student learning outcomes and learning achieved or new expectations of recent graduates by employers, it behooves faculty leading academic programs to learn and adapt so that graduates of their programs can compete in today’s marketplace. By completing the organizational learning cycle (Dixon, 1994), faculty will be encouraged to examine their
meaning structures through group and organizational dialogue, very similar to the 4i Framework suggested by Crossan et al. (1999), and make significant impacts to the academic programs. To assist those participating in academic program assessment, I propose an update to the traditional assessment loop that further clarifies and extrapolates the closing the loop step to include aspects of the organizational learning cycle (see Figure 22).

**Figure 22**

*Suggested Changes to Assessment Loop*

![Diagram of suggested changes to assessment loop]

The first three steps of the proposed assessment loop are the same as Maki’s (2010) loop: articulating learning outcomes, identifying assessment measures, and developing learning experiences. The next step would be to collect and review the data resulting from the learning experiences related to the assessment measures. This data could be classroom observations or more quantitative results from the learning experiences. Once the data is collected, it should be reviewed with other faculty in the program for mutual interpretation. Collectively, the program faculty can identify changes needed in the program based on that
data. The final step would be to implement the data-informed changes to the curriculum or pedagogical strategies used in the program.

**Faculty Motivation**

Motivation was initially defined as a latent variable that reflected three measured variables depicting regulations of external motivation (Deci & Ryan, 1985; Stupnisky et al., 2017): extrinsic, introjected, and autonomous. In the final model of this study (see Figure 20), only Autonomous Regulation of Motivation had a calculable direct effect on organizational learning and the implementation of assessment practices. The effects of Autonomous regulation of motivation were most pronounced on Organizational Learning. External and introjected, collectively controlled regulations of motivation, had no calculable impact on the hypothesized structural model. Autonomous motivation is reliant on the psychological needs of autonomy, competence, and relatedness being met (Deci & Ryan, 1985). Autonomy relates to the faculty member having choice in their activities, competence is the experience of mastery and effectiveness in the activity, and relatedness is the feeling of connection to the activities (Deci & Ryan, 1985).

The results of this study support the needs of autonomy and relatedness for faculty to engage in assessment activities by showing that their efforts in assessment activities do support and contribute to institutional performance. Increasing faculty competence related to the assessment process through professional development and assessment support will also improve their autonomous motivation related to assessment. Faculty who feel like they lack autonomy because they are forced to participate in assessment activities to maintain institutional accreditation or simply because it is part of their job have at best, no effect on institutional performance, according to this study. Baas et al. (2016) classified faculty who
perceive assessment as a burden placed upon them as anti-assessment. Faculty who are autonomously motivated to participate in assessment activities did so out of a desire to improve their programs (Baas et al., 2016) and were found in this study to have a moderate effect on organizational learning and a small effect on implementing assessment practices. Dunn et al. (2020) suggested that faculty overall do not have their needs of competence and relatedness met in reference to assessment activities and will not willingly participate in assessment activities. Baas et al. (2016) and Skidmore et al. (2018) concluded that providing evidence that assessment supports student development may increase the likelihood of faculty participation in assessment activities.

Limitations of Findings

There were multiple limitations to the findings identified in this study. First, the researcher relied on individual faculty members’ perceptions of institutional assessment activities to measure the extent of assessment implementation. Because U.S. accreditors promote and place expectations of assessment onto institutions of higher education, the self-report instrument to assess institutions’ assessment activities may have led faculty to respond as they are expected to act rather than their actual experiences (Remler & Van Ryzin, 2015). Any unanswered questions regarding the implementation of assessment practice items were assumed as false responses to minimize missing data.

Relying on faculty perceptions of institutional performance were only suggestive of that performance as perceptions can easily and quickly change (Ewell, 1989). While previous studies (Bontis et al., 2002; Real et al., 2006) have confirmed positive relationships between perceptions of institutional performance and actual performance in non-higher education institutions, there was no such triangulation of perceptual and actual data in this study.
Second, while the final sample for this study \((N = 271)\) was deemed sufficient to analyze the hypothesized structural model using SEM, it was insufficient for validating the final model that was provisionally accepted. When model respecification is performed in SEM, the respecified model should be analyzed with new data because the modifications were based on the same data used to analyze the hypothesized structural model. Therefore, the updated model was more likely to fit the original data (Kline, 2023). The initial sample size was insufficient to be split to have independent samples to examine both the hypothesized structural model and the final model. As a result, the final model could only be provisionally accepted.

Finally, this study was shaped by the researcher’s pragmatic lens, from identification of the problem and research questions, through the literature review, and in the conclusions and implications of the study. The pragmatic lens allowed the researcher to focus on informing practice and promoting change through this study. A study using different perspectives may produce different results and conclusions. For example, a study from a critical theorist’s perspective may focus on the impact of assessment activities to support students with identified factors working against their college success, such as socioeconomic background.

**Implications for Future Practice**

This study provided evidence to the supposition that implementing assessment activities does support institutional performance in bachelor’s degree programs in the United States. Specifically, organizational learning and the activities related to the closing the loop step of the assessment cycle is where the greatest impact on institutional performance can be realized. There were several implications identified as a result of this research that apply to
higher education leaders as well as those involved in leading assessment activities on their campuses.

**Implications for Institutional Leaders**

Implications for institutional leaders that arise from this study are related to both organizational learning and motivation. Leaders should champion ways to move learning from the individual through the group to the organizational level by identifying and removing barriers to the flows of learning but also identifying and enacting enhancements to the flows of learning. Such barriers or enhancements may be situated within technology and information management, strategic planning, or human resources. Providing easy access to institutional data that can be paired with academic program data will enable faculty to better understand student success in their courses by identifying gaps among populations of students represented. This may include data such as student demographics, post-graduation activities such as graduate school or employment, and student persistence in the program and at the institution. Appropriately deployed information and technology systems around assessment will also support faculty in asking better questions of their programs and making the process of assessment reporting easier to manage. Employing cumbersome or ineffective systems and processes may discourage faculty from consistently reflecting on their programs because faculty are more focused on the system or following the process than they are on the dialogue around assessment data. Conversely, systems that easily fit into faculty members’ existing processes of teaching, such as seamless integration with an institution’s learning management system to collect and embed assessment data into the reporting structure, may encourage faculty to more closely examine the data and record their intuitions related to the data or pedagogical experiences for future considerations. Such systems will allow the
institution to better manage the institutionalization of new learning that results from the
assessment process.

Strategic management of an institution’s assessment program includes identifying a
strategy for assessment that works within other institutional systems. Doing so may increase
the relatedness of assessment with faculty activities by showing how the processes work
together. When speaking about assessment, leaders should communicate that assessment is
done to increase student success rather than for compliance and accountability reasons. When
communication about assessment is compliance driven, leaders may be discouraging
autonomously motivated participation. Without the focus on students’ learning experience
through strengthening the curriculum, the assessment activities will be minimally impactful
to institutional performance. Highlighting examples of changes resulting from completion of
the full assessment process as highlighted in Figure 22 can reinforce the expectations for
program assessment and show that assessment activities promote students’ success on their
campuses. As Brown (2017) suggested, assessment efforts done to build quality academic
programs will also meet the expectations of accreditors.

Finally, institutional leaders should consider how the human capital and resource
systems support organizational learning. This could include structures of departments and
colleges, committees within and external to the academic units, and the training programs
available to faculty. Two specific actions institutional leaders should consider include
supporting faculty by hiring for assessment expertise and including assessment activities in
human resource policies. By having a team of individuals with assessment expertise to
support faculty by building assessment competence, faculty are more likely to feel competent
in that activity, one of the psychological precursors for autonomous motivation (Deci &
Ryan, 1985). Stitt-Bergh et al. (2019) suggested that collaboration between faculty, assessment professionals, and pedagogical experts will improve teaching and program design. Through such investments, faculty are more likely to feel supported and competent and therefore more likely to be autonomously motivated in this area, even if it is a required part of their responsibilities.

**Implications for Assessment Professionals**

Higher education professionals who lead assessment activities on their campuses can support faculty in assessing their academic programs by supporting a strong system of assessment. This includes identifying a common language, helping faculty build their competence, and facilitate the flows of learning among individual, group, and organizational levels. Smith et al. (2015) identified a lack of consistent terms from accreditors, authors, and practitioners related to assessment. The result of such confusion with assessment vocabulary is a lack of feeling competent by faculty and other institutional members. Assessment professionals should use a common terminology internally related to assessment activities. Even as they work with multiple accreditors who use differing terminology, understanding and using similar terms with faculty related to that accreditor will help lessen the confusion.

A second implication of this study for assessment practitioners is to build faculty competence around assessment. This includes helping faculty understand how to work through the full assessment loop as proposed in Figure 22. Perhaps one of the greatest opportunities for assessment professionals to make an impact is to help faculty make the link between interpreting the data and integrating and institutionalizing the changes identified from the data. This may include leading faculty to ask better questions of their data. If faculty as interpreting data that will have little impact on their programs, it is not likely that there
will be a great benefit to their programs. However, if faculty identify and interpret data that may have greater relevance and ask more meaningful questions about their data, the results of that interpretation may have a significant impact to their programs. This is supported by Fulcher and Bashkov’s (2012) study that found improvements to their institution’s assessment processes but not a corresponding improvement to student learning. If faculty are only asking in their assessment efforts if their programs are meeting an accreditation standard, it is likely that student learning is not being impacted.

Finally, assessment professionals should facilitate the flows of learning occurring at an individual level through the group and organizational levels. Bontis et al. (2002) identified that learning, recognized as an individual activity, must be viewed as a collective activity to have the greatest impact. This requires that academic departments consider the assessment data on the academic programs within their department, rather than the process being assigned to an individual faculty member. This may involve working with faculty leaders to support programs that give faculty autonomy to integrate identified changes in academic programs and, if they are successful, to assure that faculty know how to institutionalize those changes into the program. Schoepp and Benson (2016) found that while faculty at their institution could identify needed changes, the changes to the program went unrealized. Assessment professionals can support institutionalization of those changes by assuring faculty are aware of processes and procedures of curricular changes at their institutions.

As shown through this study, assessment is most meaningful when the results are carefully considered, and changes to the academic program are identified and implemented. Reinforcing clear and consistent practices to guide faculty in assessing their academic programs and successfully closing the loop will contribute to a higher quality of academic
programs. Specifically, assessment professionals can provide tools and support, such as helping faculty identify the best questions to ask of their data, where needed to partner with faculty, relying on their content knowledge and subject matter expertise. Such actions could increase faculty members’ autonomous motivation for assessment activities based on the self-determination theory (Deci & Ryan, 1985).

**Recommendations for Future Research**

There are multiple recommendations for future research based on this study. First, a follow up study to confirm the provisionally accepted final model would support the conclusions of this study. An alternate structure to the model was proposed and only able to be provisionally accepted. It will be beneficial to replicate this study to confirm the provisionally accepted model with a new dataset.

Identifying better measures of institutional performance. As identified in Chapter Two, identifying one measure of institutional performance is difficult due to the diversity of institutional missions across the United States. With the agreement among researchers that assessment should be done primarily to support student learning, the student educational satisfaction factor was chosen in this study. Triangulating the perceptual data with actual data would also strengthen this research. The measurement of assessment practices was also created in this study and may or may not be a sufficient measure of that variable.

There are multiple opportunities for future research related to organizational learning. First, a study that considers how the individual stocks of organizational learning interact with institutional performance and the implementation of assessment practices differently, if at all, would help further explain the relationship between these constructs. Based on the conceptual model, organizational-level learning aligns with organizational culture and would
be expected to have a slightly different impact on the other constructs, including motivation. Designing a study that better considers the impacts of the varying regulations of motivation and the psychological needs (autonomy, competence, and relatedness) to assessment practices would help further define these relationships. Related to this area, a better understanding of how learning moves from the individual level through the group and organizational levels will be beneficial to assessment professionals.

A phenomenological study that considers how the flows of learning (Crossan et al., 1999) are experienced by faculty will benefit the discussion of assessment and student success. Being able to identify institutional barriers and enhancements to the feedback and feed-forward flows of organizational learning can help institutional leaders and assessment professionals become more effective in their work with faculty and increase the quality of the academic programs within their institutions.

Conclusion

This research study was designed to provide empirical evidence of the relationship between academic program assessment activities and institutional performance in bachelor’s degree granting institutions in the United States. The final model identified through this quantitative structural equation modeling research study found that faculty motivation, the implementation of assessment practices, and organizational learning collectively account for about one-fourth of the variance in students’ educational satisfaction and providing evidence that faculty participation in academic program assessment activities does support institutional performance, as defined by the student educational experience. Because the final model was not validated with an independent sample, it was only provisionally accepted.
With a pragmatic lens to apply the research, multiple implications were identified for institutional leaders and those leading assessment on their campus. Most importantly, faculty desire to support students’ success. Therefore, faculty participation in assessment activities should be encouraged as an activity that promotes student satisfaction with their educational experience. Those who lead assessment activities on their campuses should partner with faculty to build their competence in the assessment loop, including helping faculty and academic departments through the dialogical processes that close the assessment loop and make the greatest impact on the student experience.
References

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https://doi.org/10.1007/s10755-012-9237-9


ACADEMIC PROGRAM ASSESSMENT & STUDENT SATISFACTION


Appendix A

IRB Approval

Christian, Nick

From: IRB-do-not-reply@cayuse.com
Sent: Thursday, September 7, 2023 1:11 PM
To: Christian, Nick; Miura, Yoko
Subject: IRB-2023-364 - Initial Exempt Determination

WRIGHT STATE UNIVERSITY

Institutional Review Board
FWA#00002427

Notification of Exemption Determination

Investigator Name: Nicholas Christian
Investigator Affiliation: Coll of Health Ed & Human Serv Adm (CHEHA), Leadership Studies in Educ (LDR55)
Study ID#: IRB-2023-364
Sponsor: None
Determination Date: September 7, 2023
Check-In Date: September 6, 2024

Study Title: Exploring a Relationship Between Institutional Assessment Programs and Student Success

Approved Study Sites:

- Wright State Campus, Online

This submission was eligible for Exempt Review as:
Category 2.(l): Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) if at least one of the following criteria is met:
The information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects;

The above project has been reviewed by an IRB Administrator and certified as Exempt from IRB review. This proposal protects the rights and welfare of human subjects and meets the requirements of Wright State’s Federal Wide Assurance (FWA 00002427) and the federal regulations for the protection of human subjects in research (e.g. 2018 45 CFR 46.104).

Investigator Responsibilities: As a requirement of this determination, the investigators conducting the research must:

- Comply with all requirements and determinations of the IRB;
- Protect the rights, safety, and welfare of subjects involved in the research;
- Personally conduct or supervise the research; and
- Ensure the research staff are qualified to perform procedures and duties assigned to them during the research.
How to Access Final Documents: To access the study’s final materials, including those approved by the IRB such as consent forms, recruitment materials, and the approved protocol, if applicable, please log into Cayuse Human Ethics, open the study’s workspace, and view the “Approved Documents” tab.

Expiration of IRB Approval: Exempt studies do not have an expiration date unless otherwise noted. As a courtesy, Cayuse Human Ethics will generate annual email notifications to remind investigators of the conditions of IRB approval.

Changes/Modifications: Only substantive changes to this project require a modification to be submitted to the IRB. Investigators should contact the HRPP Office if there are questions about whether a modification consists of substantive changes.

Substantive changes include, but are not limited to:

- Changes to study personnel (to review credentialing)
- Changes that involves protected health information (PHI)
- Changes that increase the risk to participants or change the risk:benefit ratio of the study
- Changes that affect a participant’s willingness to participate in the study
- Changes to the study sponsor
- Changes to study procedures that are not covered by the Exemption Category determined for this study (listed above).

New Funding: If new external funding is obtained to support this study, an Amendment must be submitted for IRB review and approval before new funds can be spent on human research activities, as the new funding source may have additional or different requirements.

Personnel Changes: Key study personnel must be listed on the IRB application. Any changes to key study personnel must to be submitted as a modification. It is the responsibility of the Principal Investigator (PI) to maintain oversight over all study personnel and to assure and to maintain appropriate tracking that these requirements are met (e.g. documentation of training completion, conflict of interest).

Incidents/Reportable Events: Certain events require reporting to the IRB. These include:

- Potential unanticipated problems that may involve risks to subjects or others
- Potential noncompliance
- Subject complaints
- Protocol deviations or violations
- Unapproved change in protocol to eliminate a hazard to subjects
- Premature suspension or termination of research
- Audit or inspection by a federal or state agency
- New potential conflict of interest of a study team member
- Written reports of study monitors
- Emergency use of investigational drugs or devices
- Any activities or circumstances that affect the rights and welfare of research subjects
- Any information that could increase the risk to subjects or impact their willingness to participate in the research.

Please report new information through Cayuse Human Ethics and contact the HRPP office with any urgent events. Please visit the Human Research Protection Program (HRPP) website to obtain more information, including reporting timelines.

Closure: If the research activities no longer involve human subjects, please submit a closure request via e-mail. Closure indicates that research activities with human subjects are no longer ongoing, have stopped, and are complete. Human research activities are complete when investigators are no longer obtaining information or biospecimens about a living person through interaction or intervention with the individual, obtaining identifiable private information or identifiable
biospecimens about a living person, and/or using, studying, analyzing, or generating identifiable private information or identifiable biospecimens about a living person.

Contact Information: If we can be of further assistance or if you have questions, please contact us at 937-775-4462 or via email at irb-rsp@wright.edu. Please visit www.wright.edu/irb to access additional resources.

Research and Sponsored Programs
3640 Colonel Glenn Highway • Dayton, OH 45435 • 937-775-4462• www.wright.edu/irb
Appendix B

Survey Instrument

Assessment & Student Success

Introduction
Assessment Practices Survey

We are asking you to take part in a research study being done by Nick Christian at Wright State University. Being in this study is optional.

If you choose to be in the study, you will complete a survey. This survey will help us learn more about assessment practices, motivation, and institutional performance. The survey will take about 10 minutes to complete.

You can skip questions that you do not want to answer or stop the survey at any time. The survey is anonymous, and no one will be able to link your answers back to you. Please do not include your name or other information that could be used to identify you in the survey responses. Information collected in this project may be shared with other researchers, but we will not share any information that could identify you.

Questions? Please contact Nick Christian at nick.christian@wright.edu. As part of their review, the Wright State University Institutional Review Board has determined that this study is no more than minimal risk and exempt from ongoing IRB oversight. If you want to participate in this study, please choose the appropriate option below and click the "Next" button.

- I consent, begin the study (1)
- I do not consent, I do not wish to participate (0)

End of Block: Informed Consent

Start of Block: Basic Information

Q01 This survey is anonymous, and no one will be able to link your answers back to you. Please do not include your name or other information that could be used to identify you in the survey responses. Information collected in this project may be shared with other researchers, but we will not share any information that could identify you.

---------------------------------------------------------------------------------------------------------------

167
Q02 Type of institution you represent
   o Two-year institution  (0)
   o Four-year institution  (2)

Q03 Which of the following describes your institution?
   o Not-for-profit public institution  (1)
   o Not-for-profit private Institution  (2)
   o For-profit Institution  (3)

Q04 How many total years have you been employed in higher education?
   o 1  (1)
   o 2  (2)
   o 3  (3)
   o 4  (4)
   o 5  (5)
   o 6  (6)
   o 7  (7)
   o 8  (8)
   o 9  (9)
   o 10  (10)
   o 11  (11)
   o 12  (12)
   o 13  (13)
   o 14  (14)
   o 15  (15)
   o More than 15  (16)
Q05 How many total years have you been affiliated with your current institution?
- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (7)
- 8 (8)
- 9 (9)
- 10 (10)
- 11 (11)
- 12 (12)
- 13 (13)
- 14 (14)
- 15 (15)
- More than 15 (16)

Q06 Do you have a faculty appointment?
- No (0)
- Yes (1)

Q07 Faculty appointment type
- Tenured (1)
- Tenure-Track (2)
- Non-Tenure Track (3)
- No Tenure Available (4)
- Adjunct/Part-time (5)
Q08 Do you have current administrative responsibilities such as program director, assistant or associate chair or dean, or similar?
   o No (0)
   o Yes (1)

Q09 What percentage of your current work load includes teaching responsibilities?
   o None (1)
   o Less than half (2)
   o About half (3)
   o More than half (4)
   o All (5)

Q10 In which academic discipline is your primary faculty appointment?
   • Arts & Humanities (1)
   • Biological Sciences, Agriculture, & Natural Resources (2)
   • Physical Science, Mathematics, & Computer Science (3)
   • Social Sciences (4)
   • Business (5)
   • Communications, Media, & Public Relations (6)
   • Education (7)
   • Engineering (8)
   • Health Professions (9)
   • Social Service Professions (10)
   • Other disciplines (11)

Q11 Is the program of study in which you teach accredited by a specialized program accreditor such as the Accreditation Board for Engineering and Technology (ABET), Association to Advance Collegiate Schools of Business (AACSB), the Council for the Accreditation of Educator Preparation (CAEP), the Commission on Collegiate Nursing Education (CCNE), or others related to your field?
   o No (1)
   o Yes (2)
   o Not sure (3)
Q20 Thank you for completing this survey. Would you like to be considered for one of three $50 Amazon gift cards?
- Yes (1)
- No (2)

Start of Block: Organizational Learning

ILL The following items relate to your observations of individuals within your organization. Please mark one response per item.

<table>
<thead>
<tr>
<th>Strongly disagree (1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>Strongly agree (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individuals are aware of the critical issues that affect their work. (1)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>Individuals feel a sense of accomplishment in what they do. (2)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Individuals generate many new insights. (3)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>Individuals feel confident in their work. (4)</td>
<td>○</td>
<td>○</td>
<td>○</td>
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</tr>
<tr>
<td>Individuals feel a sense of pride in their work. (5)</td>
<td>○</td>
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<tr>
<td>Individuals have a high level of energy at work. (6)</td>
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<tr>
<td>Individuals are able to grow through their work. (7)</td>
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<tr>
<td>Individuals have a clear sense of direction in their work. (8)</td>
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</tr>
<tr>
<td>Individuals are able to break out of traditional mindsets to see things in new and different ways. (9)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
GLL The following items relate to your observations of groups within your organization (e.g., your department, your team, people you interact with most). Please mark one response per item.

<table>
<thead>
<tr>
<th>Item</th>
<th>Strongly disagree (1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>Strongly agree (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>In meetings, we seek to understand everyone’s point of view. (1)</td>
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<td></td>
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<tr>
<td>We share our successes within the group. (2)</td>
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<tr>
<td>We have effective conflict resolution when working in groups. (3)</td>
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<tr>
<td>Groups in the organization are adaptable. (4)</td>
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<tr>
<td>Groups have a common understanding of departmental issues. (5)</td>
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<tr>
<td>Groups have the right people involved in addressing the issues. (6)</td>
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<tr>
<td>Different points of view are encouraged in group work. (7)</td>
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<tr>
<td>Groups are prepared to rethink decisions when presented with new information. (8)</td>
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</tbody>
</table>
OLL The following items relate to your organization's structure, culture, vision, and strategic direction. Please mark one response per item.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly disagree</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>We have a strategy that positions us well for the future (1)</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<td>○</td>
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<tr>
<td>The organizational structure supports our strategic direction (2)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>The organizational structure allows us to work effectively (3)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>Our operational procedures allow us to work efficiently (4)</td>
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<tr>
<td>The organization’s culture could be characterized as innovative (5)</td>
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<tr>
<td>We have a realistic yet challenging vision for the organization (6)</td>
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<tr>
<td>We have an organizational culture characterized by a high degree of trust (7)</td>
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</tbody>
</table>
**ACADEMIC PROGRAM ASSESSMENT & STUDENT SATISFACTION**

**FF** The following items relate to how you and your group influence the organization. Please mark one response per item.

<table>
<thead>
<tr>
<th>Strongly disagree (1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>Strongly agree (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lessons learned by one group are actively shared with others. (1)</td>
<td></td>
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<td>Individuals have input into the organization’s strategy. (2)</td>
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<td>Groups propose innovative solutions to organization-wide issues. (3)</td>
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<td>Recommendations by groups are adopted by the organization. (4)</td>
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<td>We do not “reinvent the wheel.” (5)</td>
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<tr>
<td>The “left hand” of the organization knows what the “right hand” is doing. (6)</td>
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<tr>
<td>Results of the group are used to improve products, services, and processes. (7)</td>
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</tr>
</tbody>
</table>

**FB** The following items relate to how systems and procedures influence you and your group. Please mark one response per item.

<table>
<thead>
<tr>
<th>Strongly disagree (1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>Strongly agree (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policies and procedures aid individual work. (1)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Group decisions are supported by individuals. (2)</td>
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<tr>
<td>Company goals are communicated throughout the organization. (3)</td>
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</tr>
<tr>
<td>Company files and databases provide the necessary information to do our work. (4)</td>
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</tr>
</tbody>
</table>

---

End of Block: Organizational Learning

Start of Block: Motivation
Mot Please indicate the extent to which each of the following statements corresponds to
WHY you engaged in teaching and research activities in the last academic year.
<table>
<thead>
<tr>
<th></th>
<th>Does not correspond at all (1)</th>
<th>(2)</th>
<th>Corresponds moderately (3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>Corresponds completely (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Because it is pleasant to carry out teaching and research activities (1)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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</tr>
<tr>
<td>Because I find this teaching and research activities interesting to do (2)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Because I like doing teaching and research activities (3)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Because it is important for me to do teaching and research activities (4)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Doing teaching and research activities allows me to attain work objectives that I consider important (5)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Doing teaching and research activities is important for the academic success of my students (6)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<td>☐</td>
<td>☐</td>
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</tr>
<tr>
<td>If I don’t do teaching and research activities, I will feel bad (7)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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</tr>
<tr>
<td>I would feel guilty not doing teaching and research activities (8)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I do not want to feel bad if I do not do teaching and research activities (9)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>My work demands that I do teaching and research activities (10)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Because my university/college obliges me to do teaching and research activities (11)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
Because I am paid to do teaching and research activities (12)

---

End of Block: Motivation
Start of Block: Assessment Practices

IAP Please indicate if the following statements are true or false in your current academic unit:

<table>
<thead>
<tr>
<th>Statement</th>
<th>False (0)</th>
<th>True (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>We have a common understanding of the academic program’s learning outcomes. (1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Our academic program’s learning outcomes align with our institutional mission. (2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Our academic program has an assessment plan to evaluate the stated program learning outcomes. (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>We involve students in identifying our program assessment measures. (4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>We involve individuals from off-campus (e.g., alumni, employers, or community partners) in identifying our program assessment measures. (5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>We have identified specific data collection methods for our program assessment. (6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>We have collected data for our program assessment. (7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Our faculty discuss program assessment data on a regular basis. (8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Our faculty share the outcomes of our assessment data with students, colleagues outside the program, institutional leadership, alumni, employers, or community partners. (9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Based on what we identify from the data, we make changes to the program. (11)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>We periodically re-examine our program assessment activities. (12)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professional development is available to better understand how to plan, implement, and use assessment practices to improve academic programs. (13)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

End of Block: Assessment Practices
Start of Block: Institutional Performance

Q15 The items in this section ask about the performance and actions of your institution. If you are not sure of the item, please make your best guess.
ACADEMIC PROGRAM ASSESSMENT & STUDENT SATISFACTION

Q16 To what extent are the following characteristics typical of your current institution?

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Strongly Disagree (1)</th>
<th>Disagree (2)</th>
<th>Neither Agree nor Disagree (3)</th>
<th>Agree (4)</th>
<th>Strongly Agree (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>There seems to be a feeling that dissatisfaction is high among students at this institution. (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>There have been relatively large numbers of students who either drop out or do not return because of dissatisfaction with their educational experience here. (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am aware of a large number of student complaints regarding their educational experience here as registered in the campus newspaper, meetings with faculty members or administrators, or other public forums. (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q17 Think of last year's graduating class at this institution. Please rate the academic attainment or academic level achieved by that class as a whole.

- That class is near the bottom of the classes across the country (1)
- That class is below average (2)
- That class is slightly below average (3)
- That class is about average (4)
- That class is slightly above average (5)
- That class is well above average (6)
- That class is among the very top classes in the country (7)
Q18 Estimate what percent of the graduates from this institution go on to obtain degrees in graduate or professional schools.

- From 0 to 15% go on to obtain advanced degrees. (1)
- From 16% to 30% go on for advanced degrees. (2)
- From 31% to 45% go on for advanced degrees. (3)
- From 46% to 60% go on for advanced degrees. (4)
- From 61% to 75% go on for advanced degrees. (5)
- From 76% to 90% go on for advanced degrees. (6)
- From 91% to 100% of the students here go on for advanced degrees. (7)

Q19 Please respond to the following questions

| How many students would you say engage in extra academic work (e.g., reading, studying, writing) over and above what is specifically assigned in the classroom? (1) |
|---|---|---|---|---|---|---|---|
| None (1) | A small minority (2) | Less than half (3) | About half (4) | More than half (5) | A large majority (6) | All (7) |
| | | | | | | |

| What proportion of the students who graduated from this institution last year and entered the labor market obtained employment in their major field of study? (2) |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

| How many students would you say attend this college to fulfill definite career or occupational goals as opposed to attending for social, athletic, financial, or other reasons? (3) |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

| Of those students who obtained employment after graduating from this institution, for how many of them was career training received at this institution important in helping them obtain their jobs? (4) |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
Q26 Thank you for completing this survey. Would you like to be considered for one of three $50 Amazon gift cards?

- Yes (1)
- No (2)

End of Block: Raffle
Appendix C

Respondent Recruiting Messages

Email & Listserv Invitation

Hello,

We invite faculty teaching at bachelor’s granting institutions in the United States to participate in a dissertation research study through Wright State University about their assessment practices, motivation, and institutional performance. This study consists of a brief online survey about these perceptions, which should take about 10-12 minutes to complete.

This study has minimal risks, and all responses will be anonymous. After the survey, participants can submit their email in a separate survey to be included in a drawing for one of three $50 Amazon gift cards.

Your participation is voluntary. If you wish to participate in this study, please click on the link: https://wright.ca1.qualtrics.com/jfe/form/SV_dhFfZaZplrB0bmm

Do you know of another faculty member who may be interested in participating? Please feel free to pass this survey invitation along!

Thank you!

Nick Christian
Director of Assessment & Accreditation
College of Health, Education, & Human Services
Doctoral Candidate, Department of Leadership Studies
Wright State University
937-775-3584
nick.christian@wright.edu

LinkedIn Invitation

As I embark on my dissertation research, I invite individuals with faculty status at bachelor’s granting U.S. institutions to participate in an anonymous survey. The survey linked below will take about 10-12 minutes to complete and will ask about your perceptions of assessment practices, institutional performance, and motivation. Complete details are included on the first page of the survey, including details for a $50 drawing. Thanks for responding and/or sharing!

#facultydevelopment #highered
Appendix D

Permissions to the SLAM Instrument

Christian, Nick

From: Crossan, Mary <nobody>
Sent: Monday, August 7, 2023 3:43 PM
To: Christian, Nick
Cc: Miura, Yoko
Subject: RE: Permission to use SLAM Questionnaire

---

CAUTION: This Message Is From an External Sender
Exercise caution when opening attachments or clicking links.

Hi Nick,

Feel free to compare the attached survey list with what you have. Yes, I have the copyright and give you permission as per your notations below. You may enjoy the attached articles as they really take the earlier work on the 4i and SLAM to a new level. Perhaps they will interest you as well. BTW one of my co-authors, Rachel Sturm is from Wright State.

Best wishes,

Mary

---

From: Christian, Nick <nick.christian@wright.edu>
Sent: Saturday, August 5, 2023 12:47 PM
To: Crossan, Mary <nobody>
Cc: Miura, Yoko <nobody>
Subject: Permission to use SLAM Questionnaire

---

External email: Only click links and attachments from recognized senders. Contact IT if you are unsure.

Dear Dr. Crossan,

I am a doctoral student in Organizational Studies at Wright State University completing my dissertation. I have enjoyed reading and learning from your work related to the 4i Framework for organizational learning and would like to use the Strategic Learning Assessment Map questionnaire in my research to evaluate the relationship between organizational learning, academic program assessment activities, and student success in U.S. institutions of higher education. My research is supervised by my graduate advisor and dissertation committee chair, Dr. Yoko Miura.

I plan to provide the SLAM questions electronically to faculty at four-year institutions. In addition to using the questions in my instrument, I also ask your permission to reproduce the questions in my dissertation which will be published electronically through the OhioLink Electronic Theses and Dissertations Center.

I would like to use and reproduce the survey questions as published by Real et al. (2015) under the following conditions:
• I will use the survey only for my research study and will not sell or use it for any other purpose;
• I will include a statement of attribution and copyright on all copies of the instrument. If you have a specific statement of attribution that you would like included, please provide it in your response; and
• At your request, I will send a copy of my research study to you upon completion and/or provide a hyperlink to the final manuscript.

If you do not control the copyright for these materials, please inform me of the proper person or organization I should contact.

If these are acceptable terms and conditions, please indicate by replying to me with an affirmation Real et al. (2015) had the appropriate version of the survey through email at nick.christian@wright.edu.

Sincerely,
Nick Christian

Nicholas T. Christian
Director of Assessment & Accreditation
College of Health, Education, & Human Services
Wright State University
172 University Hall
3640 Colonel Glenn Hwy.
Dayton, OH 45435
937-775-3584
Appendix E

Permissions to the Institutional Performance Instrument

Christian, Nick

From: Kim Cameron <xxx>
Sent: Saturday, August 5, 2023 4:21 PM
To: Christian, Nick, Miura, Yoko
Cc: 
Subject: RE: Permission to use organizational effectiveness survey

CAUTION: This Message is From an External Sender

Exercise caution when opening attachments or clicking links.

Dear Nick,

Thank you very much for your note and request to use the organizational effectiveness instrument. You have my permission to do so along with my best wishes for a successful study. I would be very grateful if you could share your results with me.

Best regards,

Kim

Sent from my Verizon, Samsung Galaxy smartphone

-------- Original message --------
From: "Christian, Nick" <nick.christian@wright.edu>
Date: 8/5/23 1:14 PM (GMT-05:00)
To: 
Cc: "Miura, Yoko"
Subject: Permission to use organizational effectiveness survey

Dear Dr. Cameron,

I am a doctoral student in Organizational Studies at Wright State University completing my dissertation. I have enjoyed reading and learning from your work related to organizational effectiveness in higher education institutions. I am writing to ask permission to use your questionnaire related to the nine constructs in my research to evaluate the relationship between organizational learning, academic program assessment activities, and student success in U.S. institutions of higher education. I am specifically interested in the four constructs of student success from the survey. My research is supervised by my graduate advisor and dissertation committee chair, Dr. Yoko Miura.

I plan to provide the survey questions electronically to faculty at four-year institutions. In addition to using the questions in my instrument, I also ask your permission to reproduce the questions in my dissertation which will be published electronically through the OhioLink Electronic Theses and Dissertations Center.

I would like to use and reproduce the survey questions under the following conditions:

1

184
I will use the survey only for my research study and will not sell or use it for any other purpose;
I will include a statement of attribution and copyright on all copies of the instrument. If you have a specific statement of attribution that you would like included, please provide it in your response; and
At your request, I will send a copy of my research study to you upon completion and/or provide a hyperlink to the final manuscript.

If you do not control the copyright for these materials, please inform me of the proper person or organization I should contact. The best version of the questions I have found was published by Ewell (1989) related to the APCU. If there is a better source of questions, I would appreciate any direction in locating them.

If these are acceptable terms and conditions, please indicate by replying to me through email at nick.christian@wright.edu.

Sincerely,
Nick Christian

Nicholas T. Christian
Director of Assessment & Accreditation
College of Health, Education, & Human Services
Wright State University
172 University Hall
3640 Colonel Glenn Hwy.
Dayton, OH 45435
937-775-3564
nick.christian@wright.edu
Appendix F

Amos Syntax

Hypothesized Structural Model (Model 1)

\[
\begin{align*}
\text{Comp}_I\text{AP} &= \text{Comp}_\text{OL}_2 + (1) \ e4 + \text{Motivation} \\
\text{Comp}_\text{Perf} &= \text{Comp}_\text{IAP} + \text{Comp}_\text{OL}_2 + (1) \ e5 \\
\text{Parc}_\text{Mot}_\text{Auto} &= (1) \text{Motivation} + (1) \ e1 \\
\text{Parc}_\text{Mot}_\text{Ext} &= \text{Motivation} + (1) \ e3 \\
\text{Parc}_\text{Mot}_\text{Intj} &= \text{Motivation} + (1) \ e2
\end{align*}
\]

Motivation \not<=>\ Comp_OL_2

Alternate Model 1 (Final Model)

\[
\begin{align*}
\text{Comp}_\text{IAP} &= \text{Comp}_\text{OL}_2 + (1) \ e4 + \text{Parc}_\text{Mot}_\text{Auto} \\
\text{Comp}_\text{OL}_2 &= \text{Parc}_\text{Mot}_\text{Auto} + (1) \ e6 \\
\text{Comp}_\text{Perf} &= \text{Comp}_\text{IAP} + \text{Comp}_\text{OL}_2 + (1) \ e5 \\
\text{Parc}_\text{Mot}_\text{Auto} &= (1) \ e1
\end{align*}
\]