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A Study Of Transparent Assessment Design And Low-Income Student Success In Washington State

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A STUDY OF TRANSPARENT ASSESSMENT DESIGN AND LOW-INCOME STUDENT SUCCESS IN WASHINGTON STATE

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Dedication

I dedicate this dissertation to my family. First, to the most formative educators in my life: my parents, John and Georgia Locks. At every point in my life, you have encouraged me to think deeply about the world around me and work hard to pursue excellence. I am grateful for your support of my education and for fostering my love of learning. You never fail to celebrate every milestone in my life. Yet, sharing this accomplishment with you is the greatest of all.

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Abstract

Transparent design has been promoted as a teaching pedagogy to promote student success, especially among marginalized student populations. This study seeks to understand the impact of participation in a transparently designed course on low-income students self-reported levels of academic self-efficacy and employer-valued skills in Washington state. This research furthers the understanding of low-income student success on campus while also providing a rigorous independent review of the Transparency in Learning and Teaching initiative's (TILT) findings. The study uses data previously collected by the Washington State TILT Higher Ed research team in the Spring 2019 semester (n = 395) through a pre- and post- test survey methodology. Using a repeated measure ANOVA, results are compared by group (low-income and not-low-income) for a change in means over time and the interaction of both time and group. The findings of the study indicate that transparent design does not have an effect on the development of academic self-efficacy or a meaningful impact on the development of employer-valued skills. The results may be explained by issues with instrumentation, a lack of implementation fidelity throughout the study, or the sample's demographics. This study identifies the need for a significant reexamination of prior findings by other researchers and the need for rigorous replication of TILT research. Additional areas related to the low-income student experience are also discussed.

Keywords: transparent design, transparent assignment design, pedagogy, teaching, low-income students, Pell Grant, employer-valued skills, academic self-efficacy, metacognition

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CHAPTER 1

INTRODUCTION

In the United States, educational attainment has become synonymous with economic success and upward social mobility (Brand & Xie, 2010; Reber & Sinclair, 2020). Low-income students who attend an elite college have an earning gap of 7.2% with high-income peers, which is 76% smaller than the national gap (Chetty et al., 2017). The federal government and higher education institutions have both worked to increase college access for low-income families in the United States. For example, the Obama Administration doubled Pell Grants and tax credits, increased college cost transparency, and worked to reform student loans (Executive Office of the President, 2017). Enrollment of Pell Grant eligible students has increased significantly in the last decade. Across 5,644 institutions, 35.3% of undergraduate students received a Pell Grant in the 2018-2019 academic year. This is an increase of 6.9% from 2008-2009 (28.4%; National Center for Education Statistics, 2022a).

Despite growing enrollment of students from socio-economically disadvantaged backgrounds, student outcomes such as graduation rates have not improved at the same rate. Low-income students struggle with many of the academic difficulties of college life. At public 4-year institutions, first-time, full-time Pell students complete a credential at a rate 16.4 percentage points below the rate of than their non-Pell peers. At private institutions, this credential gap grows to 20.7 percentage points (National Center for Education Statistics, 2022a). Some studies indicate that fewer than 15% of first-generation, low-income students earn a college degree in 6

years, compared to 62% of all other students (Alota, 2021; Cahalan et al., 2021; Dortch, 2018). Low-income student outcomes are lower than their peers.

Several factors affect low-income student persistence and completion outcomes in higher education. Many low-income students' high schools lacked the resources necessary to prepare these students for the rigor of postsecondary education. Students then find themselves academically unprepared and they quickly fall behind their peers due to the need for remedial coursework (Tinto, 2007). Once at college, low-income students self-report lower levels of academic engagement, unwelcoming campus environments, and a lack of belonging (Cahalan et al., 2021 Nguyen & Herron, 2021; Soria et al., 2013). Additionally, low-income students are more likely to work during college due to financial strain (Brand & Xie, 2017; Nguyen & Herron, 2021). Some financial strain is caused by what students refer to as the 'hidden costs' of college attendance, such as textbooks (Soria et al., 2013). Further discussion of factors influencing low-income student completion is included in the literature review in Chapter 2.

To address student lack of preparation and retention, many educational institutions have turned to comprehensive college transition programs, such as the Federal TRiO programs and Dell Scholars Program (Alota, 2021; Dortch, 2018). These programs have increased retention, completion, and academic self-efficacy (Kezar & Kitchen, 2020; Tinto, 2017). However, comprehensive college transition programs for disadvantaged students can be resource intensive. They require significant financial and staff investment for a small number of beneficiaries, with programs often failing to reach the majority of potential participants (Kezar & Kitchen, 2020; Sablan, 2014). Given the increasing pressure for cost-containment methods, it has become a public policy priority for colleges to find less resource-intensive ways to improve low-income student outcomes (Allison & Mairead, 2022; Brand & Xie, 2010). Improving measures such as

belongingness, academic self-efficacy, employer-valued skillsets, and career self-efficacy are all ways to increase low-income student performance and contribute to overall student success (Winkelmes, 2019a; Winkelmes et al., 2016).

Transparent assignment design (TAD) is one method gaining traction to promote student success. The research of Winkelmes et al. (2016) and Winkelmes et al. (2019) sought to bridge the gap between the classroom experiences, academic self-efficacy, and employer-valued skills using the TAD framework. For example, research on TAD (Winkelmes, 2019b; Winkelmes et al., 2016; Winkelmes et al., 2019) found that academic self-efficacy directly correlated with measures of student success, including higher grade point averages (GPA) As and retention rates. However, her research did not disaggregate based on student income status. Understanding academic self-efficacy is critical to understanding the framework of transparent design. Multiple studies identify self-efficacy and other elements of social cognitive theory as important prerequisites to student learning and motivation (Dinther et al., 2011; Parajes & Urdan, 2006).

Conceptual Background

The conceptual framework for the study was Bandura's (1977, 1986, 1997) social cognitive theory. The social cognitive theory focuses on the transactional nature of individual action; the environment, personal belief systems, and behavior will affect individual outcomes. Self-efficacy, a core component of social cognitive theory, is defined as "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p. 3). Initially introduced by Bandura (1977), self-efficacy can be understood as the influence a belief of competence has on human behavior. This influence is expressed through an individual's choices, actions, efforts, and resiliency (Bandura, 1977; Dinther et al., 2011).

Bandura (1977) asserted four sources influence an individual's expectations of personal efficacy. These sources are performance accomplishments, vicarious experience, verbal persuasion, and physiological states. Performance accomplishments are the most influential source of personal efficacy because they are rooted in mastery experiences. If a student is successful, then they raise expectations while a failure may lower expectations. The effect of failure on self-efficacy depends on timing and the overall pattern of experiences. Vicarious experiences refer to an individual's experience of seeing peers complete a task or perform "threatening activities without adverse consequences" (Bandura, 1977, p. 197). Seeing successful task completion alters efficacy expectations and lowers avoidance behavior. Verbal persuasion refers to how individuals' beliefs are changed through the suggestion that they can do something successfully. Although widely used, verbal persuasion can be easily mitigated or extinguished based on an individual's past performance. Physiological states, also called emotional arousal, encompass a person's overall emotional and physical wellbeing.

In social cognitive theory, self-reflection is considered a significant method to increase human capability and modify behavior (Bandura, 1986, 1997). Winkelmes et al. (2016) found that both overall and underrepresented students experienced higher levels of academic self-efficacy due to the changes in the academic environment and personal behaviors. The environmental and behavioral changes result from the implementation of transparent assignment design principles.

Transparent assignment design (TAD) is a process that promotes student metacognition through reflection in the learning process (Winkelmes et al., 2019). It incorporates many of the principles from social cognitive theory to support student development through self-reflection, vicarious experiences, and verbal persuasion. The TAD framework breaks the reflection process

down into three distinct components: purpose, task, and criteria for success. Instructors should use each component to make the learning process explicit to studying. TAD incorporates all three steps of metacognition: planning, monitoring, and reflecting. Using the framework in assignment design better prepares students to engage in the learning process.

The self-reflection inherent in the metacognitive process has been shown to enhance learning outcomes by engaging students in understanding the learning process (Hacker et al., 1998; Moely et al., 1995; Schraw, 1998). Teachers can encourage students to engage in metacognitive processes by incorporating several reflection exercises into their classroom. These reflection exercises range in nature but often include peer-level interactions, faculty mentorship, and self-reflection writing (Winkelmes et al., 2019). Reflection exercises lead students who practice metacognitive strategies to outperform their peers (Mason et al., 2010; Winkelmes et al., 2016). TAD supports students' ability to plan, monitor, and reflect on their learning, increasing their sense of competence (Winkelmes, 2019b).

TAD is part of the Transparency in Learning and Teaching in Higher Education (TILT Higher Ed) project. The initiative is committed to increasing underserved college students' success by transforming educational initiatives through the implementation of TAD principles. The framework's premise is simple: make learning explicit and accessible to all students (Winkelmes et al., 2019). In a 2016 study, researchers assessed student success for students who participated in a class with two transparently designed assignments, compared to the traditional, unrevised assignment. Students who completed transparently designed assignments had higher GPAs and a higher retention rate. Students also self-reported an increased sense of belonging, academic self-efficacy, and confidence in employer-valued skills (Winkelmes et al., 2016). Results lasted at least 2 years after participation in a TAD course (Winkelmes et al., 2019).

Statement of Purpose

Low-income students typically have lower levels of self-efficacy and employer-valued skills, leading to lower graduation rates and long-term underemployment (Nguyen & Herron, 2021; Winkelmes et al., 2016). Improving employment skills has been shown to correlate with higher performance in the classroom, though research in this area is limited (F. E. T. Y. Chan et al., 2017). Multiple studies demonstrate that self-efficacy is linked to overall academic performance such as higher levels of academic self-discipline, higher grades, and increased retention rates (Honicke & Broadbent, 2016; Panadero et al., 2017; Robbins et al., 2004). Few studies exploring social cognitive theory or self-efficacy use socio-economic status as a moderating variable (Alota, 2021; Dinther et al., 2011; Honicke & Broadbent, 2016). As higher education institutions enroll higher levels of low-income students, TAD could be a valuable tool to improve measures of student success. I sought to better understand the potential effects of transparent design on employer-valued skill development and academic self-efficacy among low-income students. I examined the effects of TAD on these measures among students from diverse socio-economic backgrounds.

Research Questions

Using data from Washington State collected by the TILT Higher Ed research team, I conducted a quantitative analysis to answer the following research questions:

1. What is the effect of participation in a transparently designed course on spring-term, low-income college students' learning experiences as measured by academic self-efficacy as compared with their peers?

2. What is the effect of participation in a transparently designed course on spring-term, low-income college students' learning experiences as measured by the development of employer-valued skills as compared with their peers?

Significance of the Study

This research contributed to understanding the low-income student experience in higher education. Factors affecting the development of self-efficacy among low-income students are still underrepresented in the extant literature as is the larger academic experience of low-income students (Dinther et al., 2011; Nguyen & Herron, 2021). For low-income students who do graduate, underemployment and lack of employer-valued skills remain a concern (Goldrick-Rab, 2016). Extant literature has largely examined the experience of individual students rather than larger institutional patterns or interventions. The question remains, why do students from low-income backgrounds experience different outcomes—even when in the same, larger environment (Dinther et al., 2011; Hurtado & Carter, 1997; Nguyen & Herron, 2021; Tinto, 2007)? TAD also acks significant peer review.

My research provided a quantitative analysis to further our understanding of both the low-income student experience and the potential impact of TAD. Findings from this study expand the knowledge base of low-resource, high-impact faculty practices to increase low-income student persistence and retention. This study examined the research of Winkelmes et al. (2016) by exploring whether TAD increased low-income student academic self-efficacy and employer-desired skills. Winkelmes et al.'s (2016) research and a subsequent study by Winkelmes et al. (2019) on the impact of transparent learning demonstrated positive results for students across racial and gender boundaries but lacked a specific analysis of low-income students' outcomes. Improving academic self-efficacy for economically disadvantaged students

is critical to retention and employment. The use of data from the TILT project provided the opportunity for critical analysis and validation of prior findings.

Definition of Terms

Listed below in alphabetical order are the operational definitions for terms used throughout the study. Authors cited as appropriate.

- Academic self-efficacy:
    - Conceptual definition: Self-efficacy refers to the "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p. 3). Academic self-efficacy refers to a learner's assessment of their own ability to reach educational goals successfully (Elias & MacDonald, 2007).
    - Operational definition: For this study, academic self-efficacy was measured by participant pre and post responses to the TILT Higher Ed survey.
- Employer-valued skills:
    - Conceptual definition: Also referred to as employability skills, employer-valued skills refer to the transferable soft skills needed by an individual that employers desire when hiring (Winkelmes, 2019a).
    - Operational definition: For this study, the development of employer-valued skills was measured by participant awareness of developing these skills. Participant awareness was measured through pre and post responses to the TILT Higher Ed survey.

- Low-income student:
    - Conceptual definition: For this research, a low-income student was defined as any Pell-eligible, undergraduate student (Dynarski et al., 2018; Dynarkski & Scott-Clayton, 2007; Goldrick-Rab, 2016).
    - Operational definition: The TILT survey collected Pell-eligibility status for each research participant from institutional data; I used that indicator. At the time of the study, a student was Pell-eligible if the expected family contribution was determined to be below the value of $5,486 in 2018-2019 (Brown, 2021).
- Metacognition: The process by which an individual thinks about their own thoughts or learning process (Hacker et al., 1998; Schraw, 1998)
- Participation in a transparently designed course: Refers to a student's enrollment in a class using TAD principles for at least two course assignments (Winkelmes et al., 2016). The operational definition of how this was measured is discussed further in the methods section.
- State Council of Higher Education for Virginia (SCHEV) TILT Team: A team of approximately 12 researchers working in partnership between TILT Higher Ed and SCHEV. The research team collects data about faculty implementation and student success under TAD. At its inception, the team was co-led by Dr. Jodi Fisler (SCHEV) and Breana Bayraktar (Northern Virginia Community College).
- Transparency in Learning and Teaching in Higher Education (TILT Higher Ed): this project supports educational development and research about the relationship between

transparent teaching frameworks and student success. The project was started in 2009 at the University of Illinois.

- Transparent assignment design (TAD): There is not a standard or uniform definition for TAD, although the term is used frequently in studies by TILT Higher Ed. At a basic level, it is a pedagogical method for rewriting assignments using metacognitive principles. A fuller discussion of the transparent assignment framework is included in the literature review.

CHAPTER 2

REVIEW OF RELATED LITERATURE

As highlighted in Chapter 1, low-income students are less likely to succeed in college when compared with peers. Existing literature has extensively examined the role of interventions such as tuition reductions, financial aid, and targeted advising in improving college outcomes for low-income students. However, the actual effects of the classroom experience on low-income student outcomes have received less attention. The Transparency in Learning and Teaching in Higher Education initiative (TILT Higher Ed) has sought to change this gap by creating an intervention to increase underserved student success (Winkelmes et al., 2016).

To better understand the conceptual background of TILT Higher Ed, this chapter will review three different constructs from the literature. First, Bandura's (1997) social cognitive theory provides a conceptual framework to understand how individual expectations and behaviors influence long-term outcomes. Then, Bandura's theory provides a lens to understand how the principles of metacognition may influence low-income student self-efficacy, skill development, and success. Third, this chapter explores the implementation of transparent design and present findings from prior research, emphasizing results related to low-income student success. The section on transparent design includes background on metacognition and as well as the basis of transparent design. Significant attention is given to the prior research of Winkelmes et al. (2016) and Winkelmes et al. (2019) since my research used her data set.

Bandura's Social Cognitive Theory

This study uses Bandura's social cognitive theory as the conceptual framework. Since the 1990s, educational researchers have given significant attention to the relationship between student self-efficacy and its impact on student learning (Dinther et al., 2011; Pajares, 1996; Schunk, 2003). Bandura (1997) defines self-efficacy as the "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (p. 3). In short, self-efficacy refers to people's beliefs about their ability to succeed. Self-efficacy does not translate universally as task and context drive it; someone with a strong sense of self-efficacy in one area of their life may not experience a strong sense of self-efficacy in another (Capa-Aydin et al., 2018). Bandura's social cognitive theory identifies four influences on the development of self-efficacy. These four sources are defined below.

The most potent source of developing self-efficacy is a mastery experience (known initially as performance accomplishments). Bandura (1977) defines a mastery experience as the interpretation of past performance on future performance. For example, if an individual experiences repeated success on a specific task, their belief that they will be successful in the future increases. Repeated or prolonged failure will lower an individual's self-efficacy. In multiple studies, mastery experiences were the only significant predictor of or had the most substantial influence on academic success across gender and race for college students (Anderson & Betz, 2001; Capa-Aydin et al., 2018; Uzuntiryaki, 2008). Additionally, mastery experiences that require overcoming challenges and sustained efforts lead to an increased sense of self-efficacy compared with easily accomplished experiences (Capa-Aydin et al., 2018; Dinther et al., 2011).

Bandura (1977) also found that individuals who observe others like themselves performing tasks without adverse consequences can improve their own experience. Bandura (1977) called this observation a vicarious experience. For example, vicarious experiences may explain why students of color score higher on standardized tests when they have a teacher of similar background (Sawchuk, 2018). Students can also experience higher levels of self-efficacy around specific tasks when peers of a similar background complete specific tasks. For example, in a study of chemistry students, 25% of the total effect on chemistry self-efficacy could be explained by vicarious experiences, as one student participant reflected: "Seeing kids do better than me in chemistry pushes me to do better." (Capa-Aydin et al., 2018, p. 1232). Mastery experiences, meanwhile, accounted for over half of the total effect on chemistry self-efficacy.

Social persuasion refers to the positive feedback individuals receive while performing a complex task that affirms or increases their self-belief. Bandura (1977) asserted that the power of suggestion leads people "into believing that they can cope successfully with what has overwhelmed them in the past" (p. 198). Social persuasion may involve verbal encouragement or written feedback; it involves interaction between at least two parties. Social persuasion is the most common tool to increase self-efficacy because it is widely available and easy to implement (Bandura, 1977). Multiple studies continue to indicate that for students of color or first-generation students, family and peer involvement play an important role in college success (Dennis et al., 2005; Jenkins et al., 2013; Patton et al., 2016; Richardson et al., 2012). In a case study of low-income students, parental involvement in education influenced student achievement and educator perceptions (Smith, 2006). Social persuasion refers to the influence which peers, family members, and educators on a student's self-efficacy. Social persuasion does not account for the expectations of success, which has not been shown to affect college student success

consistently (Dennis et al., 2005). Bandura (1977) writes that expectations without active interaction do not significantly change self-efficacy and have an inconsistent effect.

The fourth and final influence on self-efficacy is an individual's emotional state. A person's mood and emotional reaction to a complex task directly affects their belief in their ability to accomplish it. For example, fear reactions or high anxiety can lower feelings of self-efficacy. Individuals who do not experience strong, negative emotions are more likely to believe they can accomplish a specific task. Self-efficacy is affected as individuals associate specific emotions and outcomes (Pajares, 1997). Bandura (1977) writes that behavioral control and lowering an individual's "emotional arousal can reduce avoidance behavior" (p. 199). For example, students who expressed anxiety around mathematics were less likely to enroll in a biomechanics course or academically excel in the course (Wallace & Kernozek, 2017).

Other concepts of self-belief can often be confused with self-efficacy. These beliefs include self-esteem, locus of control, outcome expectations, and self-concept. However, self-efficacy differs from other forms of self-belief primarily due to its emphasis on human agency (Bandura, 1997). Self-esteem differs from self-efficacy in that self-esteem is an affective reaction focused on how an individual feels about themselves rather than a cognitive judgment (Dinther et al., 2011; Zimmerman & Cleary, 2006). Locus of control is a form of self-belief that focuses on how an individual interprets the causes of events, based on Rotter's social learning theory (2021). Self-efficacy does not focus on the cause of events but rather the belief of what specific actions produce what likely outcomes. An individual's outcome expectations refer to an individual's belief system that specific actions lead to a specific outcome. Bandura (1997) distinguished the two as follows: "Self-efficacy is a judgment of one's capability…outcome expectation is a

judgment of the likely consequence" (p. 21). Thus, the two can be distinguished based on the role of individual belief in individual action rather than on specific action alone (Dinther et al., 2011).

Self-concept and self-efficacy are related concepts commonly confused in literature, with Bandura (1986) acknowledging marginal differences between the two self-beliefs. Bandura believes the primary difference is that self-concept refers to a bigger phenomenon encompassing a more extensive system of self-beliefs and general feelings of individual competence. It is a macro-level concept that encompasses self-efficacy. Bong and Clark (1999) distinguished between the two methodologically. Through an exploratory, narrative analysis, Bong and Clark found that self-efficacy research has more consistent operational definitions and outcome measures. Bong and Skaalvik (2003) took this a step further by distinguishing the two according to the level of integration or separation in cognition and affect—with self-concept referring to a more integrated conception of self. Dinther et al. (2011) asserted that the relationship between self-concept and self-efficacy may be better understood if you consider self-efficacy a prerequisite to developing a self-concept.

Social cognitive theory focuses on reflection and the role of individual agency in modifying behavior. Environmental, cognitive, and social components all influence an individual's capacity for learning and self-efficacy. This theory is appropriate as a conceptual framework for this research as social cognitive theory shares assumptions with transparent assignment design (TAD). For example, transparent design principles provide a framework for faculty-student interaction using modeling, mastery experience, and social persuasion.

TAD

TILT Higher Ed seeks to improve student outcomes and faculty practices with metacognitive principles and TAD. Unfortunately, the literature does not define TAD

(Winkelmes et al., 2016; Winkelmes et al., 2019). TAD's definition is murky and is based on a compilation of principles rather than a singular definition. The closest definition for TAD comes from related research on transparent teaching. Researchers associated with TILT Higher Ed seem to use the terms interchangeably. In a recent article, Howard et al. (2020) cited transparent teaching methods, transparent expectations, and transparent assignments as important:

> Transparency teaching can best be defined as a combination of teaching practices that are explicit in the articulation of instructor expectations for student learning and classroom success, that rely upon unambiguous language and techniques to develop and enhance analytical and critical thinking skills and deepen student learning. (p. 199)

The combination of skills and teaching practices referenced by Howard et al. (2020) are the seven core principles of transparently designed courses and assignments (Winkelmes et al., 2019). These principles are:

1. Student cognitive bandwidth increases when faculty explicitly outline the applicability of specific academic work to the real world by providing problem-centered assignments
2. Utilizing the principles of metacognition improves student learning
3. Flexible assignments appeal to a range of learner modalities
4. Students benefit from understanding skill development and knowledge acquisition through the feedback process
5. Students are able to self-monitor when the learning criteria is accessible
6. Providing students multiple examples of work helps students begin the learning process
7. Peer learning increases content understanding and positive engagement

TAD incorporates the seven elements of transparent assessment design and explicitly outlines all three steps of metacognition. TILT Higher Ed considers a course transparently designed if it uses at least two assignments designed with transparent principles. Using the framework in assessment design better prepares students to engage in the learning process. Although grounded in significant research related to metacognition and student self-efficacy, there needs to be more peer-reviewed research about the effectiveness of TAD and the seven principles (Winkelmes et al., 2016; Winkelmes et al., 2019).

Many studies on transparent teaching focus on faculty experience rather than student gains (Winkelmes, 2019a). However, initial studies indicate positive outcomes for students who take TILT courses (Howard et al., 2020; Winkelmes et al., 2016; Winkelmes et al., 2019). TILT Higher Ed measures student success along three outcome areas: academic self-efficacy, belongingness, and mastery of employer-valued skills (Winkelmes et al., 2016). In a comprehensive study, Winkelmes et al. (2016) found that students who participated in a transparently designed course experienced significant gains across all three areas.

The movement to increase transparency in higher education teaching is not a new initiative but is borrowed from a long-standing practice in K-12 education (Barr & Tagg, 1995). Transparent design is part of the larger movement in education that emphasizes the role of the learner as central to the classroom experience. Pedagogies that highlight the role of the learner are known by a range of names. The most common are collaborative and cooperative learning (Kaufman et al., 1997; Millis & Cottell, 1997). In some texts, these names are used interchangeably (Webb et al., 2009). The primary differences between these pedagogies and TAD are the use of national standards to set curriculum metrics and that the students themselves maintain accountability for different assignments. Texts on cooperative learning are particular in

their definitions of metacognition and reflections. Overly specific definitions and prescriptive delimitations can limit flexibility in using the pedagogy and are one criticism of cooperative learning practices (Cañabate et al., 2019).

Learning How to Learn

TAD emphasizes metacognitive practices generally without providing detailed specifics. Cognition refers to the skills necessary to complete a task and metacognition is necessary to understand how a task was completed through a series of interconnected learning processes (Schraw, 1998). Metacognition is how an individual thinks about their thinking (Hacker et al., 1998; Schraw, 1998). Schraw (1998) identified three forms of metacognitive awareness: declarative, procedural, and conditional. Declarative knowledge refers to knowledge about the individual learner and how they learn. For example, what is the capacity for individual memorization, and what factors impact performance? Procedural knowledge refers to the strategies of how to learn, such as how to categorize conflicting information. Conditional knowledge requires learners to recognize which situations necessitate declarative knowledge and which require procedural knowledge.

Teachers can encourage students to engage in metacognitive processes by incorporating several reflection exercises into their classroom. The self-reflection inherent in the metacognitive process has been shown to enhance learning outcomes by engaging students in understanding the learning process (Hacker et al., 1998; Moely et al., 1995; Schraw, 1998). This reflection leads students who practice metacognitive strategies to outperform their peers (Mason et al., 2010; Winkelmes et al., 2016). This learning gain is partly because metacognition is associated with students' ability to plan, monitor, and reflect on their learning.

Planning, monitoring, and reflecting are the three cornerstones of metacognitive practice (Schraw, 1998; Williamson, 2015). King (1991) and Schraw (1998) define the three steps as questions for the learner to resolve. The *planning* step in metacognition asks learners to engage in self-questioning and plan their engagement in the learning process. For example, is this task similar to one they have done before? *Monitoring* encourages learners to check in with themselves about their task-completion process. For example, do they understand the task, are they making progress towards the learning goals, and what changes are needed? *Reflecting*, also called evaluating, is an explicit opportunity to determine what worked, what did not, and whether the learner achieved their ultimate goal. The use of metacognitive principles in the classroom can promote student meaning-making and how to learn about learning (Fink, 2013; Gibbs, 1992).

Learning how to learn is one of the six forms of significant learning identified by Fink (2013). Fink proposed that faculty identify and create significant learning experiences that enhance students' well-being. He identified three primary sources of active learning: getting information, doing experiences, and reflecting on one's learning. These three elements of significant learning experiences mirror the three elements of the metacognitive principles and Winkelmes (2019b) transparency framework. The transparency framework's three components are purpose, tasks, and criteria (Winkelmes et al., 2019). Purpose refers to the information and ideas the learner can gain from the experience. Task refers to the specific action a learner requires to complete the task. Criteria are the expectations of good work and real-world examples which provide an opportunity for self-monitoring.

Comparing the transparency framework with the elements of significant learning experiences, TILT has the potential to meet the criteria for a significant learning experience with positive student outcomes. Through his research, Fink (2013) identifies six different kinds of

significant learning experiences: Foundational knowledge, application, integration, human dimension, caring, and learning how to learn. These six learning experience will accomplish four goals: (a) enhance individual learning, (b) enhance positive social interactions, (c) develop citizenship skills, and (d) prepare students for professional success. These four goals of significant learning experiences echo the three outcomes measured in TAD research (Winkelmes et al., 2016; Winkelmes et al., 2019): self-efficacy, employer-valued skills, and sense of belonging. Significant learning "makes a difference in how people live" (Fink, 2013, p. 7).

Prior Research on Transparent Design

While gains were made for all students who took a class using TAD principles, prior research indicates that marginalized students experience more significant gains than their peers (Winkelmes, 2019a; Winkelmes et al., 2016). Although the largest gains were found among multiracial students, low-income students experienced statistically significant gains in all areas (Winkelmes et al., 2016; Winkelmes et al., 2019). For example, low socioeconomic status (SES) students who participated in more transparent courses had an average score of 4.0 for the sense of belonging (out of 5.0) as compared to low-income students in less transparent courses had a score of approximately 3.7. The statistical difference between these scores had a small effect size (.34) and a $p < .05$. A pilot experiment in the California State University system found similar results (Magruder et al., 2019). Thus, I expected similar results in this study.

Winkelmes (2019a, 2019b) asserted that the benefits of transparent instruction are not short-lived. In a subsequent analysis of her 2016 study at the University of Nevada Las Vegas, first-year students who participated in transparent courses retained at a higher rate compared with their peers, with a 15.52 percentage point difference (Winkelmes, personal communication,

June 10, 2021). Low-income students retained at a 19.74% higher rate over 1 year than their low-income peers who did not take transparent courses.

The benefits of transparent teaching design do not appear limited to in-person instruction. In a quasi-experimental investigation of student course performance over 4 semesters, Howard et al. (2020) found that students with online instruction typically achieved lower course grades than peers participating through in-person instruction. Course performance improved by introducing transparent design methods, after which there was no statistically significant difference in course grade achievement between the two samples. With the rise of online instruction, this study may have important implications for faculty development and online teaching effectiveness (Hebert, 2022). The study was unable to collect demographic data about the students to understand the impact on marginalized students, including low-income—who appeared more likely to enroll in the online course (Howard et al., 2020).

Despite these promising results, there are some concerns with the research. The methodology for achieving results needs to be clarified in the three student-outcomes-focused publications (Magruder et al., 2019; Winkelmes et al., 2016; Winkelmes et al., 2019). For example, why are the pre-test and post-test surveys different—how does this impact analysis? What internal and external validity measures were taken to ensure the data collected is viable? Magruder et al. (2019) did not publish the statistical results of their analysis for low-income student sub-groups. Information about sample composition is not available for either study. In the 2016 and 2019 publications, Winkelmes et al. do not cite any limitations to their data collection or analyses. The lack of reflection and articulation in the process is a concern. Magruder et al. (2019) did discuss challenges in the faculty recruitment process, limitations due to sample size, and balancing their roles as research practitioners. Magruder et al. (2019) also

had several confounding variables in their data analysis that made direct comparisons difficult—such as the switch of campuses from quarters to semesters.

All three publications lack significant literature reviews—relying instead on their data or articles for validation. Winkelmes et al. (2016) cited one study as the justification for establishing specific metrics of study. Then, the justification of metrics is perpetuated in additional studies without rigorous review. Magruder et al. (2019) quoted Winkelmes et al. (2016) as their primary source for engaging in the research and cited only one other article about faculty development. The research team with Magruder et al. (2019) did not include any internal or external validity information. The lack of information about validity is concerning since Winkelmes et al. (2016) and Winkelmes et al. (2019) did not publish these results either (although Winkelmes et al. [2016] referenced validity tests).

Furthermore, only one of these articles has undergone a rigorous peer review before publication (Howard et al., 2020). The journal *Peer Review*, which features the first major publication on TILT Higher Ed, is not a peer-reviewed journal; instead, it is a collection of practices recommended by the AAC&U. Table 1 summarizes research about TAD.

Table 1

Summary of TAD Publications

Authors (Year)	Focus or Research Question	Findings	Peer Reviewed?
Winkelmes et al. (2016)	"What is the effect …on spring-term first-year college students' learning experiences, especially underserved students' experiences…?" (p. 31)	In courses with more transparency, students experienced greater learning benefits compared with peers; gains measured in three areas: academic confidence, sense of belonging, and employer-desired skills.	No
Winkelmes et al. (2019)	A book which discusses how the use of TAD can address equity gaps and improve student outcomes	See above; data from same sample	No
Magruder et al. (2019)	Implementation in California State system; faculty and student participants were surveys	Positive outcomes for students in sense of belonging, academic confidence, and employment skills. No impact on student GPA. Faculty report positive outcomes with student homework performance.	No
Humphreys et al. (2019)	A case study from UNLV about how the transparency framework was used to promote faculty development and collaboration	Several examples of cross-departmental collaboration were identified. Recommendations for adopting this faculty development and course planning model are made. No empirical data.	No
Tarr et al. (2019)	Case study of implementing TILT in Indiana with faculty learning workshops	Identifies areas of future assessment as TILT is implemented at institutions. Five recommendations for faculty implementation include using existing networks, leadership of project, identifying faculty leaders, capture student perspectives, and sharing research data.	No
Whetham et al. (2019)	Case study from Washington state community colleges about faculty creating defined learning outcomes	Author self-reports that faculty are working to redesign courses to address equity gaps and improve student outcomes; lacks follow-up data	No
Howard et al. (2020)	Quasi-experimental study exploring impact of transparent teaching to mitigate negative effects of virtual classroom	Students in a virtual course with transparent methods had similar academic performance with students who participated in in-person instruction; improvement from traditional methods, where there was a significant performance gap	Yes

Low-Income Student Experience

It is essential to understand the experience of low-income students on campus to understand the potential effects of transparent design on low-income student learning. In the past 2 decades, policymakers have shifted focus towards outcomes, such as graduation and retention, for low-income students rather than on accessibility and affordability (Zhou & Mendoza, 2017). Low-income students, in particular, face significant challenges during their time of study; these challenges may surpass their access and affordability stress. Through academic success and program completion, students realize the greatest economic benefits of higher education. Financial aid, paid employment, and academic resources are all factors in low-income student persistence. This section examines low-income students' challenges related to access and success (persistence).

Throughout this research, a low-income student is defined as any Pell-eligible undergraduate student. This definition aligns with other quantitative research on the low-income student experience (Dynarski et al., 2018; Dynarkski & Scott-Clayton, 2007; Goldrick-Rab, 2016). In 2018-19, a student would be considered Pell-eligible if the expected family contribution is below the value of $5,486 in 2018-2019 (Brown, 2021). However, it is important to note that this definition ignores a large percentage of the low-income students enrolled in higher education who might not complete the Free Application for Federal Student Aid (FAFSA) to qualify for Pell Grant eligibility (Zhou & Mendoza, 2017). The decision to use this definition was made because the institution independently verified Pell Grant status in the sample of my study. The verification process eliminates errors with student self-reporting SES.

Access to higher education has increased dramatically in the past decades—with the undergraduate student body being more diverse than ever before. The increase in access reflects

changing demographics nationally and the national push for equity in education (Means & Pyne, 2017; Zhou & Mendoza, 2017). The Pell Grant is emblematic of this movement. The Pell Grant started in 1972 and is an initiative by the federal government to provide need-based aid in higher education to low-income families. It remains one of the primary tools for increasing access to higher education, with the federal government spending nearly $30 billion annually on the program (Ma & Pender, 2021). In 2017-2018, more than 7 million low-income students used the Pell Grant to access college. While the amount awarded varies, the average award was $3,740 (Ma & Pender, 2021).

In Washington state, the study state, low-income students increasingly form a larger part of the enrollment numbers. In 2008-09, 20.8% of undergraduate students enrolled at a postsecondary institution in Washington received a Pell Grant. In 2018-19, at the time of the study, this figure increased to 25.6% of undergraduate students received a Pell Grant (National Center for Education Statistics, 2022a). Similar trends are available nationally, with the percentage of undergraduate students receiving Pell Grant funding increasing from 28.4% in 2008-09 to 34% in 2018-19 (National Center for Education Statistics, 2022a). While graduation rates are increasing overall, data shows that a significant completion gap persists between non-Pell and Pell students. According to recent Integrated Postsecondary Education Data Systems (IPEDS) data for the 2017 cohort, 80% of 4-year institutions graduate low-income students at a lower rate than non-low-income peers (National Center for Education Statistics, 2022a). Nearly a third of 4-year institutions have more than 10% completion gaps between Pell and non-Pell students. In the case of 13.7% of institutions, they are graduating less than 25% of Pell students within 6 years. Community college Pell students' graduation rates are even lower than peers enrolled at 4-year institutions (National Center for Education Statistics, 2022a).

More than financial assistance is needed for student completion (Broady & Hershbein, 2020; Means & Pyne, 2017; Tinto, 2017; Zhou & Mendoza, 2017). Tinto (2002, 2007, 2017) has repeatedly argued that the debate around access needs to be reframed. He wrote that we "need to move beyond thinking of access solely as enabling people to gain entry to higher education…[but] providing individuals realistic opportunities to earn a four-year college degree" (2002, p. 1). Reframing the conversation from access to persistence and graduation has important implications. For example, the wage gap between college and high school graduates continues to widen. In 1975, college graduates earned 1.5 times much as high school graduates. Today, college graduates earn double compared to high school graduates (Broady & Hershbein, 2020). Compared with students who start college and never finish, the number is almost twice as many. Thus, understanding factors that affect low-income student success in college and ways to close the gap is critical to addressing more considerable economic inequity in the United States.

Pell Grants, and many other financially based programs, provide access. The gap in student outcomes related to retention and graduation speaks to the different experiences low-income students have on campus compared to peers from moderate or high-income backgrounds. For example, low-income students are more likely to work while taking classes. As a result, students may limit their engagement in extracurricular or academic opportunities (Means & Pyne, 2017; Soria et al., 2013; Tinto, 2007). Low-income students are also less likely to have traveled abroad or completed advanced academic work—which can play into faculty-bias towards low-income students' potential for academic success expectations are typical for faculty to have of students (Pyne & Means, 2013). Furthermore, low-income students are likelier to be students of color (Engle & Tinto, 2008; Goldrick-Rab, 2016; Nguyen & Herron, 2021).

Generally, the experience of low-income students leads to the perception that the academic environment is unwelcoming and unsupportive (Means & Pyne, 2017; Soria et al., 2013).

Retention and GPA remain important quantitative measures of student success, particularly for low-income students. Retention rates are important as students who are not retained are less likely to return to college or take significantly longer to reach their goals (Engle & Tinto, 2008). Institutions invest resources in students who still need to graduate, which produces no measurable outcomes and limits the potential for alumni engagement (Engle & Tinto, 2008; Millea et al., 2018). Institutions are also incentivized to promote low-income student retention; increasing student retention is one avenue to increase funding in a competitive admissions environment (Millea et al., 2018). At public universities, taxpayers can view attrition rates as a waste of resources. For low-income students, grade achievement is tied to their Pell eligibility status. Pell-eligible students with low GPAs risk losing their Pell Grant funding due to insufficient academic progress (Engle & Tinto, 2008).

Despite overwhelming evidence that low-income students are experiencing inequitable outcomes in higher education based on their economic situation, the reasons—and potential solutions—are significantly under-researched (Goldrick-Rab, 2016; Means & Pyne, 2017; Nguyen & Herron, 2021). This literature review finds that low-income students' employment status, academic preparation, and sense of belonging on campus all impact grade achievement and retention. A brief description of employment and academic preparation follows. The sense of belonging is discussed in more detail in the following section.

Financial pressures for low-income students lead many to seek employment while pursuing a degree; many hold multiple part-time or work full-time jobs while pursuing an undergraduate degree (Goldrick-Rab, 2016; Nguyen & Herron, 2021). Of all low-income college

students who seek a college-level credential, 80% work while pursuing an education (Carnevale & Smith, 2018). Despite working more hours than previous generations of college students, learners are simultaneously reporting higher levels of debt and loans (Carnevale & Smith, 2018).

The financial pressure to work outweighs other responsibilities and limits the time available for other academic and extracurricular opportunities (Means & Pyne, 2017; Soria et al., 2013). Middle and upper-class students spend significantly less time working and more time collaborating with peers (Soria et al., 2013); nearly 15% of low-income student-employees worked over 20 hours a week compared to 7.8% of middle and upper-class students. This finding is notable as students who work 15 hours a week or more are increasingly likely to earn an average of a C or below (Carnevale & Smith, 2018).

While time constraints with employment impact academic performance, so does financial stability. Many low-income students report that with the rising cost of tuition and fees, they are less likely to buy academic materials such as textbooks, quiz software, or supplemental materials (Means & Pyne, 2017; Nguyen & Herron, 2021; Soria et al., 2013). In a qualitative analysis, textbooks were reported to be the most expensive purchase of the semester (Nguyen & Herron, 2021). When students cannot purchase textbooks before the start of the semester, they are more likely to fall behind and withdraw or receive a lower grade (Means & Pyne, 2017; Nguyen & Herron, 2021). By withdrawing from courses, low-income students are less likely to graduate on time (Cañabate et al., 2019).

As previously mentioned, research related to transparent design focuses on three outcomes: academic self-efficacy, employer-valued skills, and student sense of belonging. A discussion of research related to low-income students and each outcome follows below, providing a more detailed look at the low-income student experience on campus. Winkelmes

(2019a) writes that these three outcomes were identified for two reasons. First, a review of relevant literature identified a relationship between specific outcomes and student persistence and grade achievement. Secondly, institutional leaders expressed interest in these outcomes.

Academic Self-Efficacy

Academic self-efficacy refers to a learner's assessment of their ability to reach educational goals successfully (Bandura, 1986, 1997; Elias & MacDonald, 2007). Academic self-efficacy is developed through methods similar to general self-efficacy (Schunk, 1991) but typically occurs in an educational context. Schunk (1991) writes that observing peers complete tasks and receiving positive feedback increases academic self-efficacy. Academic self-efficacy can decrease significantly even after an initial increase if a learner encounters repeated failure (Schunk, 1991); this is due to mastery experiences' significant influence on self-efficacy development. In a meta-analysis of higher education research, Dinther et al. (2011) identified that college students' mastery experiences from middle and high school have long-lasting effects on a student's academic self-efficacy—both positive and negative. To overcome negative experiences, postsecondary interventions designed around strengths and talents could positively influence academic self-efficacy (Dinther et al., 2011).

Multiple studies provide “overwhelming support for the relationship between academic self-efficacy and academic performance” (Honicke & Broadbent, 2016, p. 66). These studies range from exploring the role of academic self-efficacy in different educational settings (Dinther et al., 2011; Robbins et al., 2004) to achievement in a specific subject matter (Capa-Aydin et al., 2018; Honicke & Broadbent, 2016). In a meta-analysis of university students, academic self-efficacy correlated positively with academic performance, explaining up to 9% of the variance in student GPA (Richardson et al., 2012). Komarraju and Nadler (2013) surveyed 257

undergraduate students to understand the relationship between GPA and six other variables. The only variable which significantly predicted GPA was academic self-efficacy. Khan et al. (2013) found comparable results in a sample of 66 college students, linking higher levels of academic self-efficacy with higher academic achievement.

In their analysis of 59 papers exploring the relationship between academic self-efficacy and academic performance, Honicke and Broadbent (2016) only identified six papers with non-significant findings. These papers employed different methodological approaches, so a singular explanation of these results is not immediately apparent. Honicke and Broadbent (2016) suggested that the timing of measurement and some of the studies' small sample sizes likely played a role. One additional study, published after Honicke and Broadbent conducted their analysis, did not find a significant relationship between academic self-efficacy and academic performance. Maropamabi (2014) conducted research using a sample of 100 undergraduate students. The unexpected findings could be explainable by the sample demographics from the University of Botswana. Overall, most research on academic self-efficacy shows a positive relationship between academic self-efficacy and student performance.

While multiple studies attempt to understand the relationship between academic self-efficacy and academic performance, few review the mediating factors. Honicke and Broadbent (2016) conducted a narrative review of 59 papers to identify mediating and moderating factors between performance and academic self-efficacy. From their analysis, emotional regulation and procrastination have a mediating effect on academic self-efficacy. Robbins et al. (2004) found that among university students, psychological factors and self-efficacy had a larger impact on academic performance than more traditional measures such as socioeconomic status and standardized test performance. Cottrill (2018) examined the mediating effect of academic self-

efficacy and teacher attitudes toward low-income students. Cottrill found that low-income students with higher levels of academic self-efficacy had higher levels of academic achievement, regardless of teacher expectations of their performance. Research suggests that increasing low-income student self-efficacy can improve overall academic achievement, overcoming the challenge of faculty attitudes towards low-income students.

Additional research, particularly longitudinal studies, is needed to explore further the relationship between academic self-efficacy and performance among different demographics. Extant literature does not discuss the relationship between low-income students, academic performance, and academic self-efficacy without including a mediating factor, such as parental or teacher expectations (Cottrill, 2018; Honicke & Broadbent, 2016) or only discusses it as one factor of many (Robbins et al., 2004). Given the significant amount of research about the impact of academic self-efficacy on academic performance, it is surprising that the literature lacks significant discussion of how these results vary by racial and socioeconomic groups.

Employer-Valued Skills

In addition to increasing students' sense of academic self-efficacy, TAD has increased student development of employer-valued skills. Throughout this dissertation, employer-valued skills refer to the transferable soft skills employers value in hiring. Winkelmes et al. (2016) identified these skills using national surveys by Hart Research Associates in 2013 and 2015 that identify "the skills employers value most when hiring new employees" (Winkelmes, 2019a, p. 9). In their analysis, Hart Research Associates found that employers wanted more emphasis on the following:

1. Critical thinking (82% of respondents)
2. Analysis and problem solving (81% of respondents)

3. Written and oral communication (80% of respondents)
4. Application of knowledge in real word settings (78% of respondents)
5. Evaluation of information from multiple sources (72% of respondents)

The associates also identify innovation, collaboration, and ethical decision-making as desirable skills for future employees. As will be discussed in Chapter 3, Winkelmes incorporated these skills into her TILT project assessments. Students self-report their aptitude in each skill area on the pre-and post-test evaluation as part of the TILT experience.

Using metacognitive practices has enhanced students' development of employer-valued skills. For example, in a meta-analysis of research on employability in higher education, Römgens et al. (2020) found that metacognition enhances a student's ability to practice self-management. Self-management refers to the ability to self-evaluate progress or performance and adjust to improve outcomes (Bridgstock, 2009). These benefits are not exclusively limited to the classroom. Metacognition can also enhance student employer-valued skill development through implementation beyond the classroom.

The Iowa Guided Reflection on Work program is one example of metacognition enhancing employer-valued skills beyond the classroom. Guided Reflection on Work is a program in which student employees and supervisors have a brief conversation centered around four reflective questions. Research has shown that students who participate in guided reflection are more likely than their peers to report improved communication, time management, problem-solving, and conflict management (Peck et al., 2016). While 68% of Iowa GROW participants (*n* = 411) report that their job has helped prepare them for full-time employment, only 53% of non-Guided Reflection on Work students report the same (Schnelle, 2021).

Proponents of transparent design in higher education propose that by shifting the way classes are taught, students will experience increases in soft skill development. Although neither Winkelmes et al. (2016) nor Winkelmes et al. (2019) provide conceptual or empirical evidence, the extant literature supports this claim. Teaching pedagogy can have a significant impact on the development of employer-valued skills. Ineffective teaching pedagogies are a challenge that limits student skill development in higher education (F. E. T. Y. Chan et al., 2017). Students in process- and student-focused classrooms find higher levels of employer-valued skill development (C. Chan, 2012; F. E. T. Y. Chan et al., 2017). Despite evidence that curriculum plays an important role in skill development, many faculty lack "the experience or knowledge to introduce, teach, and assess generic competencies despite also recognizing the importance and need to do so" (F. E. T. Y. Chan et al., 2017, p. 5). F. E. T. Y. Chan et al. (2017) identified nine studies highlighting the connection between curriculum changes and employer-valued skill development among students.

In a grounded theory analysis of 56 peer-reviewed papers about the development of employer-valued skills among college students (which they refer to as "generic skills"), F. E. T. Y. Chan and their colleagues (2017) discovered three barriers: Lack of institutional and curriculum support, operational challenges, and the role of faculty and student perceptions. One of their recommendations for improving employer-valued skill development is that teaching pedagogy, curriculum design, and teachers must have a shared language (F. E. T. Y. Chan et al., 2017). Once a conceptual base is established, institutions and faculty can collaborate to improve student outcomes. Transparent design could be a conceptual framework to support employer-valued skill development, as was done at the University of Nevada Las Vegas (Humphreys et al.,

2019). SES and other demographic categories are not found as statistically significant factors in employer-valued skill development (F. E. T. Y. Chan et al., 2017).

Research on career outcomes for low-income students focuses on career self-efficacy and long-term employment outcomes rather than developing specific skill sets. Research shows that low-income and first-generation students typically need more support in career preparation than their peers. Low-income students typically have lower levels of career self-efficacy than their peers and self-report lacking awareness of career decision options (Engle & Tinto, 2008; Kezar & Kitchen, 2020; Pulliam et al., 2017). Studies show that early intervention, such as through summer transition programs or freshman seminars, can improve student understanding of their values, interests, and skills (Kezar & Kitchen, 2020; Pulliam et al., 2017). Early intervention can increase career self-efficacy "by empowering students to seek information about themselves and career-related information during their early years in college" (Pulliam et al., 2017, p. 92). Understanding ways to develop employer-valued skills among low-income students effectively is essential in closing the achievement gap between low-income students and their more affluent peers.

Family SES can significantly affect long-term employment and educational outcomes. For example, for students who were in 9th grade in 2009, students were employed at the same rate whether they came from low-SES families or high-SES families (62 vs. 64 percent; National Center for Education Statistics, 2022b). However, there was a 50 percentage point gap between postsecondary enrollment among students who come from low-SES families (28%) and high-SES families (78%). In an employment and education status analysis, students from low-SES families were 5 times less likely than their highest-SES peers to be either enrolled or employed (National Center for Education Statistics, 2022b). These statistics are particularly concerning

when we consider long-term employment outcomes. Among 25- to 34-year-olds in 2019, 86% of young adults with a bachelor's degree or higher were employed, and 75% of young adults with some college were employed. Compare this with the 68% employment rate for young adults who completed high school but never enrolled in college. Increasing access to higher education and employment outcomes for low-income students can dramatically close the socioeconomic achievement gaps.

Beyond the individual benefit for students to improve their long-term employment outcomes, colleges and universities are also incentivized to ensure their students are equipped for professional success. For example, with the creation of the College Scorecard by the Department of Education in 2015, institutional data related to employment rates, salaries, and debt of college graduates is readily available (Department of Education, 2023). In addition, the College Scorecard reflects a political environment in which there is increased accountability from policymakers and stakeholders to provide transparent data about the employability outcomes of college graduates.

Sense of Belonging

The third variable commonly discussed in TILT research is a sense of belonging (Winkelmes et al., 2016; Winkelmes et al., 2019). Although not a variable of interest for this dissertation, a discussion is included here as I expect sense of belonging to appear in my factor analysis. In their research, Winkelmes et al. (2016) shared findings that students of color, first-generation students, and the general student population increase their sense of belonging through participation in a transparently designed course. Extensive research and attention have been given to the relationship between a sense of belonging and a student's experience in higher education (Hurtado & Carter, 1997; Strayhorn, 2019; Tinto, 2007). Early theorists

conceptualized a sense of belonging in higher education as synonymous with community or group membership (Goodenow, 1993; McMillan & Chavis, 1986). However, these models typically referred to the student's role in the classroom setting and largely ignored the extracurricular experience. More recent research has broadened the definition to include engagement within the larger campus community, academic integration, and social connection (Jacoby & Garland, 2004; Tinto, 2007). Strayhorn (2019) takes this further by emphasizing personal connection and the concept of mattering.

More recent research that considers the experience of marginalized students as compared to privileged students continues to discount the role of SES in belongingness (Goldrick-Rab, 2016; Nguyen & Herron, 2021). For example, when comparing minoritized and privileged student experiences in higher education, Vaccaro and Newman (2016) found that student organization membership was a cornerstone to promote belonging. However, this research should consider the economic barriers to participation in extracurricular activities commonly experienced by low-income students (Hamilton, 2013; Means & Pyne, 2017). Research by Nguyen and Herron (2021) found that financial constraints limit low-income students' sense of belonging. In a qualitative study with 30 low-income students, Nguyen, and Herron (2021) found that students feel tension about wanting to belong and their financial position. These findings build on the prior research of both McClure and Ryder (2018) and Means and Pyne (2017). The tension between finances and academic engagement may lead students to experience ridicule or exclusion from group activities (Nguyen & Herron, 2021).

In the research of Nguyen and Herron (2021) and McClure and Ryder (2018), some conclusions about low-income student belonging may not be generalizable for three reasons. First, the participant pool in each study was significantly skewed in favor of female participants.

The skewed sample may have affected the salient themes and trends. Due to the nature of qualitative research, the overall number of participants in the studies was also low and lacks generalizability. Additional interviews may have yielded different insights. Finally, Nguyen and Herron (2021) and McClure and Ryder (2018) conducted qualitative research at a single institution.

Summary

Low-income students remain underserved in higher education as many access-related initiatives do not address long-term academic performance or persistence issues. Self-efficacy and employer-valued skill development both have the potential to have a significant, positive impact on low-income student success. Transparent design principles reflect best practices from social cognitive theory, significant learning experiences, and metacognitive practices. Initial results are promising, highlighting its potential as an intervention to improve underserved student persistence. However, research from the current TILT Higher Ed team (Winkelmes et al., 2019) lacks significant depth and rigor—particularly in its methodology. This study addressed these gaps through independent analysis and a review of a different data set related to low-income students. Chapter 3 outlines the specific methodology of this study.

CHAPTER 3

METHODS

I examined the effect of Transparent Assessment Design (TAD) on student self-efficacy and employer-valued skills by socioeconomic class in the state of Washington. Low-income students' retention and academic success are increasingly important within higher education (Means & Pyne, 2017). For example, performance-based funding models in Florida incentivize enrollment of Pell-eligible students at public institutions (Board of Governors, 2022). In Virginia, low-income access is a priority in the 2020 strategic plan (SCHEV, 2020). As discussed in Chapter 2, the classroom experience for low-income students influences their sense of belonging, academic confidence, and self-efficacy (Tinto, 2007; Winkelmes et al., 2016). While current literature indicates that TAD can improve student outcomes, current literature has yet to specifically analyze the effect of transparent design on low-income student experiences (Winkelmes et al., 2019).

This chapter details the components of this study's research design. The chapter addresses the research strategy, sampling method, data collection process, data analysis, and study quality indicators. I used a positivistic, non-experimental design that incorporates survey data and student demographic information for data generation. Different statistical tests were used for data analysis. This survey design used the same dataset from the prior work of Winkelmes et al. (2019) while analyzing a different portion of the population.

Research Questions

As stated in previously in chapter one, the following three research questions formed the basis of my research:

1. What is the effect of participation in a transparently designed course on spring-term, low-income college students' learning experiences as measured by academic self-efficacy as compared with their peers?
2. What is the effect of participation in a transparently designed course on spring-term, low-income college students' learning experiences as measured by the development of employer-valued skills as compared with their peers?

Overview of Methods

I used data previously collected by the Washington State TILT Higher Ed research team to address the research questions. The research team used a quantitative research design and employed a survey methodology. A survey methodology is appropriate to capture quantitative data from a sample and generalize the results to a larger population (Creswell, 2014; Groves et al., 2009). Furthermore, survey methodology is appropriate given the economy of the design in both cost and resources (Groves et al., 2009). Of the various kinds of surveys available, Creswell (2014) identified five forms of data collection: mail, telephone, interviews, group survey, and personal interviews. To address the research questions, administering the survey via the web was most appropriate. Data collection occurred asynchronously at multiple institutions with different academic calendars and needed to reach a large sample through gatekeepers. Electronic surveys are convenient, no-cost, easily distributed, and have a quick turnaround time on data collection. The distribution of the survey is discussed in more detail in the sections that follow.

Population and Sample Demographic Information

The target population for this research included all students enrolled in higher education institutions within Washington State who participated in a transparently designed course in Spring 2019. At the time of the study, a transparently designed course was defined as "tilting" two assignments in a course (Winkelmes, personal communication, September 18, 2022). “Tilting” a class meant rewriting assignments using the TAD framework. The size of the total population is unknown by the TILT Higher Ed researchers. The dataset provided by TILT Higher Ed has 989 complete participant responses, matched for pre- and post-test survey results. The sample for this research will be a select group of students participating in the TILT educational intervention during the Spring 2019 semester only (n = 395). I selected to analyze the data from Spring 2019 because it had the largest sample size of any semester. The sample demographic data for participants from Spring 2019 are listed below. Since specific population demographics are unavailable, a comparison of the sample with the total enrollment demographics in Washington higher education is provided. The demographic data are pulled from IPEDS.

The sample (n = 395) is an appropriately sized sample for generalizability. To determine this, I used the procedures outlined by Krejcie and Morgan (1970) to identify the appropriate sample size. For example, in a population of 1,000,000, 384 participants are considered an appropriate sample. Krejcie and Morgan (1970) wrote, "It should be noted that as the population increases, the sample size increases at a diminishing rate and remains relatively constant at slightly more than 380 cases" (p. 610). Given that total enrollment in higher education in Washington state was 504,420 for the 2018-2019 academic year, the sample size is appropriate for this research (National Center for Education Statistics, 2022a).

Faculty served as gatekeepers to recruit student participants. Faculty were recruited throughout 2015-2019 for participation in the Washington longitudinal study. Faculty were recruited through outreach emails, workshops, and referrals. Faculty who agreed to participate in the study then shared the survey link with all students in their course for participation in the research. No incentives, such as extra credit or compensation, were provided to participants for completing the survey. This methodology is one form of convenience, cluster sampling, with each cluster being a different course (Groves et al., 2009).

Table 2 provides an overview of the demographics of the sample and the population for this study.

Table 2

Sample and Population Demographic Data

Demographic	Total Sample Spring 2019 *N* = 395	% of Sample	Population % *N* = 504,420
Gender			
Male	249	63%	43.7%
Female	146	37%	56.3%
Ethnicity			
White (including Latino)	179	45.8%	49.7%
Black, or African American	14	3.5%	4.2%
Asian	107	27%	9.4%
American Indian or Alaska Native	6	1.5 %	< 1%
Native Hawaiian	2	< 1%	< 1%
Two or more	47	11.9%	7.4%
Middle Eastern/North African	31	7.8%	N/A
Unknown or no response	1	< 1%	8.5%
Other race	3	4%	N/A
First Generation			
Yes	146	37%	N/A
No	249	63%	N/A
Low-Income (Pell-eligible)			
Yes	162	41%	N/A
No	233	58%	N/A
Enrollment by Basic Carnegie Classification			
Associate's Colleges: Mixed Transfer/Career & Technical-High Traditional	50	12.7%	10.5%
Baccalaureate/Associate's Colleges: Associate's Dominant	338	85.5%	61.6%
Master's Colleges & Universities: Larger Programs	7	1.7%	13%

This sample indicates some potential problems with the dataset and subsequent conclusions. First, community colleges and trade schools are significantly overrepresented in the type of institution included in the sample. In prior research, Dr. Winkelmes has limited her sample to 4-year colleges; including data could change results due to the different enrollment demographics of community college students. Research indicates that educational attitudes and aspirations can differ for community college students as compared to students enrolled at four-year institutions (Whetham et al., 2019).

Community colleges and trade schools also have different enrollment patterns, with wider demographic ranges (Whetham et al., 2019). For example, the most recent data available indicates that in 2017, 88% of all high school students in Washington State were dually enrolled at a postsecondary institution. Data was not available to ascertain if students in the study were dual enrollment students. However, the participation of dual enrollment students and subsequent impact was likely minimal. All participants were required to be above the age of 18 at the time the study began in January 2019. The inclusion of dual enrollment students could skew results as high school students and first-time in college students may benefit more than their peers from transparent design (Winkelmes et al., 2019).

In the sample, men are represented at a higher rate than women, likely due to enrollment patterns at higher education institutions. In the past decade, women are currently enrolling in higher numbers than men in four-year colleges and universities (National Center for Education Statistics, 2022a). Additionally, the demographics have some overrepresentation of certain population groups. The largest difference between the sample and the population is the number of Asian participants (27%). The survey developed by Dr. Winkelmes, discussed below, does not include Hispanic as an option on the ethnicity question.

Instrumentation

This study's survey instrument was a tool developed by the TILT initiative and used throughout its associated research (Winkelmes et al., 2016; Winkelmes et al., 2019). Permission was obtained from Dr. Winkelmes to use their assessment. A copy of the pre-and post-survey, can be found in Appendix A. As my study is part of a larger research effort, not all pre- and post-surveys questions will directly address the research questions related to self-efficacy and employer-valued skills. Other issues, such as sense of belonging, were explored in the larger TILT research (Winkelmes, 2019a; Winkelmes et al., 2016). Table 3 identifies which concepts are explored by survey questions; again, the primary variables of interest were academic self-efficacy and employer-valued (employability) skills. It is still unclear how these specific areas of interest were first identified from the literature. Winkelmes (2019a) does not include comprehensive literature reviews on each concept in her writings. However, each of the factors below has been shown in other studies to improve using metacognitive practices. It is an assumption that the prior research informed the development of the survey.

Table 3

Table of Specifications: Concepts Assessed in Survey

Concept	Data sources from Winkelmes et al. (2019)
C1. Academic confidence	Q. 19, 21-22, 25-26
C2. Scientific reasoning	Q.17, 45-47
C3. Employability skills	Q. 13-14, Q. 16, 18-19
C4. Sense of belonging	Q. 33 – 35, 48-49
C5. Amount of transparency in course	Q. 36-44

Note. Q = Question, C = Concept

One significant concern with the survey instrument is that reliability and validity measures have yet to be discussed in prior publications. Dr. Winkelmes shared the initial TILT psychometric exploratory factor analysis data through individual outreach. These measures of internal consistency and test-retest correlations were reported following the initial publication and data collection process (Winkelmes et al., 2016). Data are available in Table 4. The analysis was conducted and written by Sarah Thoman, a graduate student at the University of Nevada, in May 2017. The results below resulted from the prior research on TAD (Winkelmes et al., 2016; Winkelmes et al., 2019) and are not from my research.

Table 4

EFA, Descriptive Statistics, and Reliability Results for Survey Questions

Survey Question Groups	EFA Results	EFA Results (Forced Factors)	α
Perceived Transparency	SPSS generated 2 factors: 1st factor Q36-42, 2nd factor Q43-44; Q43 (annotated examples) especially high on factor 2	When forced 1 factor, Q44 (Tools Assess) loaded okay (.675) but Q43 (Annotated Examples) loaded poorly (.470) Paired t-test	Reliability .894 overall for all 9 items
Employer-Value	SPSS generated 1 factor; no question loaded for lower than .685	N/A; SPSS generated 1 factor with Eigenvalues	Reliability .926 overall for 11 items
Confidence-School and Field	SPSS generated 1 factor; no question loaded for lower than .921	N/A; SPSS generated 1 factor with Eigenvalues Chi-Square	Reliability .821 overall for 2 items
Scientific Reasoning	SPSS generated 1 factor; no question loaded for lower than .934	N/A; SPSS generated 1 factor with Eigenvalues	Reliability .853 overall for 2 items
Belonging	SPSS generated 1 factor; Belong_School_Commty loaded lowest at .699	N/A; SPSS generated 1 factor with Eigenvalues	Reliability .798 overall for 5 items

Note. Analysis statistics by Thoman (personal communication, July 8 2022); EFA = exploratory factor analysis; TILT = Transparency in Learning and Teaching

Both internal validity and reliability measures are high for measures of student self-efficacy (here: confidence). The measure of internal consistency for employer-value skills is moderate, with a score of .685. Reliability for the 11 items of employer-value skills is high, with a Cronbach alpha of .926.

I independently conducted an exploratory factor analysis (validity) and a coefficient alpha (internal reliability) measure. These analyses were conducted to independently verify that

the instruments were both valid and reliable before proceeding to data analysis. While I initially tried replicating the analyses as Thoman (personal communication, July 8 2022) wrote, multiple error messages were received. The instruction and details of the analysis provided by Thoman were challenging to follow, as specific decisions related to the data analysis process were not outlined and, thus, were not replicable. My subsequent statistical analysis process is outlined here.

One of the major differences between my exploratory factor analysis and Thoman's (personal communication, July 8 2022) analysis is that I chose only to analyze questions duplicated on the pre-and post-test. To improve the validity of my findings and conclusions, I included items with corresponding pre- and post-test questions. This reduced the number of variables included in the factor analysis from 41 items (Thoman, personal communication, July 8 2022) to 12 items. These 12 items are listed in Table 5. I made this change as the research questions specifically address change over time.

Table 5

Variables and Survey Inclusion

Survey Questions	Variable code	Pre-test	Post-Test
I can express my ideas effectively when I write	Express_Ideas_Write	X	X
I can communicate effectively when I speak	Express_Ideas_Speak	X	X
I collaborate well with others on academic work	Collaborate_Academic	X	X
I am good at breaking down ideas…into pieces so I can consider them	Analyz	X	X
When I am given information from multiple sources… making connections between them	Synthesize	X	X
I am able to apply the things I have learned to new problems and situations	Apply_New_Contexts	X	X
I tend to consider the ethical implications of my actions	Consider_Ethics	X	X
I am capable of learning on my own	Capable_Self_Learn	X	X
Rate your confidence about your ability to succeed in school	Confidence_Succeed_School	X	X
Rate your confidence about your ability to succeed in this field	Confidence_Succeed_Field	X	X
I am able to judge the reliability of information from various sources	Judge_Reliability	X	X
I feel I am a member of my school's community	Belong_School_Community	X	X

I used the Principal Axis Factoring (PAF) extraction method with a varimax rotation for my factor analysis. I did not specify a specific number of factors in advance but based extraction on Eigenvalues greater than 1. In my results, I directed SPSS to suppress all coefficients under .35. The Kaiser-Meyer-Olkin measure of sampling adequacy is .881, which indicates that each factor can predict enough items. In addition, the Bartlett test is statistically significant (.000). This score indicates that the variables are related enough to be summarized into a few factors. With these assumptions met, I reviewed the rotated factor matrix results. The matrix, reproduced in Table 6, highlights three factors.

Table 6

Rotated Factor Matrix

Variable code	1: job-related skills	2: belonging	3: academic self-efficacy
Express_Ideas_Write	.513	.417	
Express_Ideas_Speak		.519	
Collaborate_Academic		.589	
Analyz	.666		
Synthesize	.729		
Apply_New_Contexts	.555		
Consider_Ethics			
Capable_Self_Learn	.472		
Confidence_Succeed_School			.611
Confidence_Succeed_Field			.672
Judge_Reliability			
Belong_School_Community		.451	

Note. Extraction method used was Principle Axis Factoring with a Varimax rotation with Kaiser Normalization

Factor 1 corresponds with job-related skills. Factor 2 corresponds with a sense of belonging, as the variables deal with issues of communication, belonging in the community, and collaboration. Finally, Factor 3 includes two variables related to self-reported student ability to succeed in the field of study and in school more generally. In reviewing the literature, variables in factor three correspond to students' belief in their ability or sense of self-efficacy. While the sense of belonging factor includes more variables than I may have initially expected based on the prior research of Winkelmes et al. (2016) and Thoman (personal communication, July 8, 2022),

the results align with theories of belonging. Strayhorn (2019) asserts that social connection and opportunities to express oneself fully contribute to an individual sense of belonging. Reliability scores for the items in each factor are available in Table 7.

Table 7

EFA Reliability and Validity Findings

Survey Question Groups	EFA Results	α
Employer-Valued Skills	SPSS generated 1 factor; no question loaded lower than .485	Reliability .802 for 5 items
Belonging	SPSS generated 1 factor; no question loaded for lower than .417	Reliability .765 overall for 4 items
Self-Efficacy	SPSS generated 1 factor; no question loaded for lower than .611	Reliability .717 overall for 2 items

Note. EFA = Exploratory Factor Analysis; SPSS = Statistical Package for the Social Sciences

With α above .7 for all three factors, these factors have an acceptable rate of internal consistency. However, results with reliability below 0.8 are recommended to proceed with caution as it may indicate a degree of error (Tavakol & Dennick, 2011). A further discussion of reliability and results is included in Chapter 4 and Chapter 5.

Data Collection

Data collection took place in two phases during Spring 2019: a pre-test at the beginning of the semester and a post-test at the conclusion of the semester. Demographic data were linked to the survey data when the pre-test data were received. The survey was distributed by faculty members teaching a transparently designed course who agreed to participate in the TILT

research initiatives. Dr. Winkelmes, who is leading the overall TILT research team, served as the primary point of contact for all faculty. The collected data for student surveys was linked to student demographic data available with a unique identifier. The demographic data includes student grade information. Individual personally identifiable information, such as name and address, is not available through the dataset.

Data Analysis

Table 8 highlights the relationship between the research question, the data sources, and the subsequent type of data analysis. Questions are divided between the pre-and post-test in the Data Sources section. The survey administration was supplemented with participants' self-reported demographic information. The demographic information includes data about SES, gender, and ethnicity.

In the first research question, which measures the effect of participation in a transparently designed course on participant self-efficacy, the dependent variable is student self-reported self-efficacy. The independent variable is participation in a transparently designed course. I conducted two statistical analyses: a paired t-test and an ANOVA. Descriptive statistics are also reported. The paired t-test compared students reported self-efficacy prior to taking a transparently designed course and following completion of the transparently designed course. The scores for individual students were in the analysis. One t-test analyzed results for all participants, and a second t-test will only use the data for the targeted low-income student sample. This comparison will determine whether low-income students experienced greater gains than their peers.

As one of Winkelmes et al.'s (2016) major assertions is that low-income and other underserved student populations experience greater gains from TAD than their peers, a one-way

ANOVA was then conducted. The one-way ANOVA compared the effect of transparent assessment design on student self-efficacy between low-income students and students who are not low-income. Based on Winkelmes et al.'s (2016) and Winkelmes et al.'s (2019) prior research, I anticipated that low-income students would experience greater gains than their peers in the sense of belonging after participating in a transparently designed course. A Tukey's HSD test was conducted as part of the post hoc analysis. The Tukey's test ensures a Type-I error is not committed. Tukey's HSD test is one of the most common types of post-hoc analyses and can be used to figure out which groups differ in a sample (Kiess & Green, 2019).

For the second research question, the independent variable remains the same—participation in a transparently-designed course. The dependent variable for question two is employer-valued skills. This was measured with self-reported student data on pre- and post-test surveys. The data was analyzed using the same methodology as the first research question: descriptive statistics, paired t-test, and a one-way ANOVA will be conducted with a Tukey's HSD test.

Table 8

Data Sources and Data Analyses

Research question	Data sources	Data analysis
Q1. Compared with their peers, what is the effect of participation in a transparently designed course on spring-term low-income college students' learning experiences as measured by academic self-efficacy?	Q: Please rate your confidence about your ability to succeed in school. Q: Please rate your confidence about your ability to succeed in this field.	Descriptive statistics Repeated measures ANOVA
Q2. Compared with their peers, what is the effect of participation in a transparently designed course on spring-term low-income college students' learning experiences as measured by the development of employer-valued skills?	Q: I can express my ideas effectively when I write. Q: I am good at breaking down the ones, ideas and experiences into pieces so I can consider them. Q. When I am given information from multiple sources, I have an easy time making connections between them. Q: I am able to apply the things I have learned to new problems and situations. Q. I am capable of learning on my own.	Descriptive statistics Repeated measures ANOVA

Note. Q = Question; ANOVA = Analysis of Variance

Relationship to Larger Study

This dissertation originally began as a smaller research project within the context of a larger study organized by the State Council of Higher Education for Virginia (SCHEV). Dr. Jodi Fisler coordinated the project team of 10 more researchers from across Virginia. Each researcher

brought independent research questions that informed the study's design and participant recruitment efforts. Throughout 2021 and 2022, the SCHEV project team prepared to conduct research like that conducted in Washington state by Dr. Winkelmes. Unfortunately, the COVID-19 pandemic affected participation in the study. While 300 faculty attended workshops, at the time of survey administration, only 16 student responses were received in Spring 2022. The sample size was insufficient to move forward with the analysis.

In consultation with Dr. Fisler and Dr. Winkelmes, I determined that an analysis of the existing Washington State dataset could address my research questions. The TILT Higher Ed team was interested in this research as no analysis of the impact on low-income students has been performed. Additionally, there are several individual components to my analysis. As stated, there are some concerns about the survey's validity and reliability. Individually, I examined the psychometrics of collected data by checking its reliability and validity. I reviewed the data from the pre- and post-test survey instruments and created a codebook outlining how I translated responses from words to numbers; no codebook was available to me for use with the existing data set (Creswell, 2014). I reviewed data entries for accuracy and identified any potential outliers or incomplete responses which may need to be removed; none were identified. In SPSS, I conducted the analyses required to answer my research questions. As part of this process, I checked for assumptions and identified any corrections which needed to be made (if assumptions were not met). As discussed previously, I was unable to replicate the findings of Thoman (personal communication, July 8 2022).

Delimitations and Assumptions

In this section, I discuss the delimitations and assumptions that informed my research. The delimitations discussed were informed by my research questions and theory.

Delimitations

In the research related to the TILT initiative, several student success factors are explored beyond self-efficacy and employer-valued skills. These factors, like the sense of belonging and confidence, are beyond the scope of this dissertation. However, the data were collected for each metric, and subsequent analysis could explore the impact of TILT on these variables. Additionally, I am primarily focusing my analysis on low-income student population groups despite having significant other demographic data. Prior studies have reported the impact of TILT on student success by gender, first-generation student status, and ethnicity.

Assumptions

In this study, there were two primary assumptions. The first assumption is that all faculty participating in the study received exposure to the TILT framework and methodology before agreeing to participate. This exposure may range in nature and timing as the framework has been presented at conferences and published. The second assumption is that faculty faithfully implemented all or most transparent framework elements for at least two assignments.

Researcher as Instrument

As a researcher, I do not have any personal connection to the research being conducted as I do not live or work in Washington state, nor do I identify as a low-income student. In addition, although I have taught college-level coursework previously, I did not teach while I conducted my research analyses. I believe that TAD principles can positively affect student outcomes. However, I used a secondary dataset, so my beliefs did not bias the data collection or analysis process.

Ethical Considerations

As part of the research study process, none of the survey data collected information attached to a specific student's name or information. All datasets were coded with confidential participant numbers, and I could not access personally identifying information. Confidentiality is central to protecting the dignity and rights of the participants (Creswell, 2014). The overall TILT research study has already been approved through Brandeis University's IRB. All participants who participated in the research completed an informed consent form. A copy of the form is included in Appendix B.

To protect participant rights, I gained approval from the William & Mary School of Education Institutional Review Board in February 2023. As a higher education practitioner at a public institution in Virginia four years after the study's conclusion, it is highly unlikely that I will interact with a student who participated in the study.

CHAPTER 4

FINDINGS

The purpose of this study was to determine if there was a statistically significant effect of participation in a transparently designed course on 2019 spring-term low-income college students' learning experiences as measured by academic self-efficacy and employer-valued skills. This chapter reports on the statistical analyses described in the methodology section. For each research question, I provide a review of the hypotheses, a description of the analyses, and a presentation of the resulting data.

Research Question 1: What is the effect of participation in a transparently designed course on spring-term, low-income college students' learning experiences as measured by academic self-efficacy as compared with their peers?

There are two hypotheses I am testing for this question. One hypothesis is that participation in a transparently designed course has no effect on spring-term college students' academic self-efficacy. The second hypothesis is that there is no difference in effect as measured by academic self-efficacy between low-income college students and their peer groups.

To test these hypotheses, I compared the pre-test variable "Pre_Confidence_SP2019" to the post-test variable "Post_Confidence_SP2019" in SPSS. The self-efficacy subscale consisted of two items identified in the factor analysis which have an acceptable level of internal reliability ($\alpha = .72$). The alpha of the post-measure between the pre- and post-test composite variables is questionable ($\alpha = .67$) which may impact the ability to find statistically significant results. The

descriptive statistics for the variables and comparison groups of low-income and not-low-income are available in Table 9.

Table 9

Descriptive Statistics for Research Question 1

Sample	Low-income?	*M*	*SD*	*N*
Pre_SelfEfficacy_SP2019	No	2.459	.498	232
	Yes	2.482	.487	163
	Total	2.468	.493	395
Post_SelfEfficacy_SP2019	No	2.489	.523	232
	Yes	2.469	.523	163
	Total	2.481	.523	395

Note. Scale values: min = 1; max = 5

A repeated measures ANOVA was performed to compare the effect of participation in a transparently designed course on academic self-efficacy. The ANOVA revealed that there were no effects for group, time, or the interaction of group and time. These results are detailed in Table 10.

Table 10

Results of the Repeated Measures ANOVA for Self-Efficacy

Tests of Within-Subjects Contrasts						
Source	Time	Type III *SS*	*df*	*MS*	*F*	Sig.
Time	Linear	.015	1	.015	.120	.730
Time * Group	Linear	.086	1	.086	.673	.413
Error (Time)	Linear	50.382	393	.128		
Tests of Between-Subjects Effects						
Group	N/A	.000	1	.000	.001	.977
Error	N/A	152.993	393	.389		

Note. ANOVA = Analysis of Variance

Research Question 2: What is the effect of participation in a transparently designed course on spring-term, low-income college students' learning experiences as measured by the development of employer-valued skills as compared with their peers?

Like the first research question, there were two hypotheses I tested for this question. The first hypothesis is that participation in a transparently designed course has no effect on spring-term college students' self-reported employer-valued skills. The second hypothesis is that there is no difference in effect as measured by employer-valued skills between low-income college students and their peer groups.

To test these hypotheses, I compared the pre-test composite variable "Pre_EmployerSkills_SP2019" to the post-test composite variable "Post_EmployerSkills_SP2019" using SPSS. The employer-valued skills subscale consisted of five items identified in the factor analysis which have a good level of internal reliability (α = .802). The alpha of the post measure has an acceptable rate of reliability (α = .749). The

descriptive statistics for the variables and comparison groups of low-income and not-low-income are available in Table 11.

Table 11

Descriptive Statistics for Research Question 2

Sample	Low-income?	*M*	*SD*	*N*
Pre_EmployerSkills_SP2019	No	2.944	.532	232
	Yes	2.931	.499	163
	Total	2.939	.518	395
Post_EmployerSkills_SP2019	No	3.082	.540	232
	Yes	3.094	.481	163
	Total	3.087	.516	395

Note. Scale values: min = 1; max = 5

A repeated measures ANOVA was performed to compare the effect of participation in a transparently designed course on employer-valued skills. The ANOVA is examining three effects: group, time, and the interaction of both time and group. The results show a significant effect for time only. The result indicates that participants' employer-valued skills did change over time. The means show a higher mean at post than pre indicating a growth in employer-valued skills. The lack of group or interaction effects says that the growth was consistent over groups, and they were at the same level. Table 12 outlines these results.

Table 12

Results of the Repeated Measures ANOVA

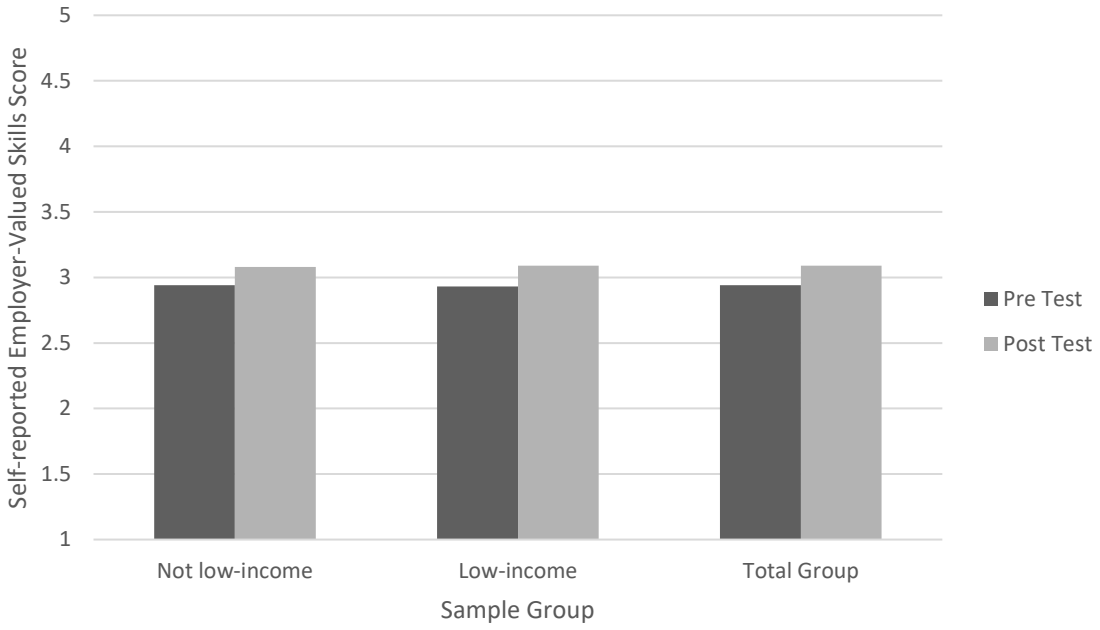
Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Tests of Within-Subjects Effects					
Time	4.309	1	4.309	40.003	<.001*
Time * Group	.031	1	.031	.291	.590
Error (Time)	42.331	393	.108		
Tests of Between-Subjects Effects					
Group	5.366E-5	1	5.366E-5	.000	.991
Error	168.473	393	.429		

Note. ANOVA = Analysis of Variance
*$p < .05$

Although the findings are statistically significant across time, the difference between the pre-test and post-test means is 0.15; this difference is not meaningful and does not demonstrate the expected significant growth. Figure 1 illustrates the minimal difference between the two scores.

Figure 1

Comparison of Mean Scores for Employer-Valued Skills by Group



Note. Minimum score on scale = 1; maximum score on scale = 5

Summary of Findings

The participant pool consisted of 395 students who participated in a transparently designed course in Spring 2019 in Washington State. Of these, 163 participants (40.1%) identified as low-income. In comparing the results of the pre- and post-tests administered to students, the results of the analyses demonstrated that TILT instruction has a limited impact. There is no statistically significant effect on student self-efficacy. While TILT instruction does have an impact on the development of employer-valued skills, there is no statistically significant difference between low-income students and peers in self-reported skill development.

The results of the study call into question prior research by Winkelmes et al. (2016) and Winkelmes et al. (2019) and negate her recommendation that low-income students would benefit

from TAD initiatives. Chapter 5 outlines the major findings of this study and discuss the implications of the research. Recommendations for future research and practical application are also discussed.

CHAPTER 5

DISCUSSION AND RECOMMENDATIONS

The research examined the relationship between a transparent teaching intervention and students' self-reported levels of self-efficacy and employer-valued skill development. Additional exploration assessed differences among peers by Pell-eligibility status. These findings, their relationship to research hypotheses and prior research, are discussed here. The implications of the research and subsequent findings are important. Independent replication of prior research regarding transparent teaching is clearly needed. Some of the findings indicate potential directions for new research while highlighting the need for rigorous, independent replication. The findings and implications of this research are discussed in greater detail below.

Summary of Major Findings

From prior research about students of color and first-generation students, it is expected that low-income students would experience more significant gains than their peers in self-efficacy and employer-valued skills (Kezar & Kitchen, 2020; Pulliam et al., 2017). The results indicate that Transparent Assignment Design (TAD) did not have a differential impact on low-income students and their peers. Transparency in Learning and Teaching initiative's (TILT) instruction did affect the development of employer-valued skills but not in a meaningful way; there was not a statistically significant impact on the development of academic self-efficacy for students in this study.

Finding #1: Academic Self-Efficacy

The findings did not support the first hypothesis as none of our findings were statistically significant. TAD was not shown to improve academic self-efficacy, with greater gains for low-income students. Given both the prior research of Winkelmes et al. (2019) and the significant research about the relationship between metacognition and self-efficacy (Dinther et al., 2011; Honicke & Broadbent, 2016 Robbins et al., 2004), these results are surprising. Additionally, the conceptual framework of Bandura would lead us to believe that elements of transparent instruction, such as self-reflection and feedback, would affect student self-efficacy. Reviewing the results, it is important to consider why there is no difference when we expect one. There are several likely explanations for these findings: the integrity of implementation and reliability issues in the factor analysis. Demographics of the sample may also be a contributing factor.

The study might not represent a rigorous implementation of TAD. Namely, the implementation process lacked fidelity checks. Throughout the study, researchers did not sit in on courses, monitor assignments, or track faculty fidelity in adhering to TAD principles. To what degree faculty implemented transparent teaching without independent review is impossible to know. In this study, there was no controlled environment. The lack of fidelity and monitoring could explain why significant results were found in Humphreys et al. (20219 and not in this research.

Given the significant extant literature outlining the relationship between metacognition and self-efficacy development, an instrumentation issue could have caused this result. The analysis uncovered issues in the reliability measures between the pre-and post-test items. The alpha was below .7 at the post-test, which indicates questionable interrelatedness between the items at that time. Lower reliability would indicate a higher amount of error, making statistical

significance less likely. The alpha score can be affected by the number of items and the interrelatedness of items on a survey (Tavakol & Dennick, 2011). To improve the alpha score, items can be revised or added as appropriate to increase the correlation until an alpha value of approximately .9 has been achieved. Alpha scores above .9 typically indicate redundancy and indicate some items can be deleted (Tavakol & Dennick, 2011). Additional limitations with the survey instrumentation are discussed below.

The demographics of the sample may have played a role in the outcomes. In this study's sample, 34.8% of participants identified as either Asian or Middle Eastern/North African. Some international journals provide evidence that different cultural groups, particularly those with a stronger sense of in-group collectivism, might look at the construct of self-efficacy differently (Honicke & Broadbent, 2016; Maropamadi, 2014; Northouse, 2021). According to Northouse (2021), who studies the dimensions of culture, in-group collectivism refers to the degree to which individuals work together to achieve goals and identify with the achievements of a group. Additional research is needed to determine how research on academic self-efficacy may be impacted by the sample demographics. Additionally, prior results of statistically significant findings occurred at 4-year institutions. This study almost exclusively included community colleges. Given that community college students are likely to have different aspirations and backgrounds compared with students at a 4-year institution, this may have had a moderating effect on results (Ma & Pender, 2021; Whetham et al., 2019). Unfortunately, student outcome results from Whetham et al.'s (2019) research at two Washington state community colleges are not available for comparison.

Findings #2: Employer-Valued Skills

The second hypothesis, that transparent instruction could increase students' self-reported employer-valued skills and low-income students would experience relatively more significant increases, was partially confirmed. The statistical analysis demonstrated a statistically significant difference over time for all students (p <.001). However, the difference between the means is not meaningful—a difference of only 0.15. The small difference is not practical to recommend implementation. A question that educators may consider moving forward is whether the resources needed to implement transparent teaching outweigh the output. Similar to the discussion of Research Question 1, the effects of the intervention may have been influenced by the lack of rigorous implementation and monitoring, issues with the instrumentation, or a difference in demographics among the sample.

The statistically significant results affirm the prior research about how the use of metacognitive teaching pedagogies, such as TAD, can improve the development of employer-valued skills (F. E. T. Y. Chan et al., 2017; Römgens et al., 2020; Winkelmes et al., 2016). The reason for the improvement is because metacognitive practices focus on enhancing reflective skills related to self-management and learning (Römgens et al., 2020). Furthermore, based on the experience of the employment programs like Iowa GROW, we would expect students who engage in metacognition in higher education—regardless of the curricular or cocurricular environment—to experience an increase in their employer-valued skills.

Our analysis found no statistically significant difference in the development of employer-valued skillsets among low-income students compared to their peers. These findings are surprising given the prior findings of Winkelmes et al. (2016) and Winkelmes et al. (2019) but do confirm findings from the extant literature. In a grounded theory analysis of 56 international

studies, F. E. T. Y. Chan et al. (2017) found that there are three primary factors associated with employer-valued skill development. They are (a) the need for more institutional and curriculum support; (b) operational challenges, including pedagogical challenges; and (c) teacher and student perceptions. Although it might logically follow that demographics would affect a student's skill development or perceptions, there is insufficient evidence in the literature to support this claim.

Limitations

In this section I present limitations associated with my research. The primary limitations include instrumentation concerns, sample demographics, and the use of secondary data.

Instrumentation

The empirical results reported herein are subject to several limitations, primarily connected to the survey instrumentation. Documentation made available by the TILT Higher Ed team, such as in Winkelmes et al. (2019) needs to disclose critical information, including the steps taken in the factor analysis process. In publications, reliable information regarding the data set and survey is unavailable. The lack of information makes it difficult to replicate and evaluate the statistical rigor of the methods used. Even when information was available, such as the factor analysis information from Thoman (personal communication, July 8 2022), it was unable to be replicated.

In the three most cited publications related to TILT Higher Ed, the literature review focuses on transparent design and metacognition theories. The TILT project is theory-driven but needs more evidence of using theory in decision-making. The TILT project provides minimal discussion about the construct design of items related to belonging, employability, self-efficacy, and scientific reasoning were identified. At the most, Winkelmes (2019a) wrote, "important

studies already connected academic confidence and belonging with student persistence…metacognition as an essential learning skill…and national surveys identify the skills that employers value most" (pp. 8-9). For a study based on a conceptual framework, it is unclear how the framework or the survey items were developed for inclusion. For example, questions about reflection and the impact of faculty feedback may have been a helpful part of the self-efficacy factor, in line with existing research (Cottrill, 2018; Honicke & Broadbent, 2016). Rather, the items had some repetition between skills that could contribute to academic self-efficacy and employer-valued skills. More variation and distinction between items are needed, as well as justification for inclusion. The limited access to information and decision-making made it difficult to replicate both the process and prior findings of Winkelmes et al. (2016) and Winkelmes et al. (2019).

The difficulty in replication is best exemplified by the significantly different independent exploratory factor analysis results. Through this analysis, I developed different subscales and composite variables related to my areas of inquiry. The reliability of the items on each subscale was sufficient for analysis. However, the reliability measures for self-efficacy between pre-and post-test were below 0.7, which might have affected the ability to find statistically significant results. The low-reliability measures may be due to the reduced number of items included in the analysis. While Thoman (personal communication, July 8, 2022) originally included 41 items in the factor analysis, I reduced this number to 12. As my research is interested in change over time, only items that appeared on the pre- and post-test were included. If the item was not included on the pre-test, the true relationship of growth through the intervention cannot be determined. In the factor analysis, 10 of the items populated across three themes which corresponded with employer-valued skill development, academic self-efficacy, and sense of belonging. Given the

existing literature, these results were not surprising. However, increasing the number of items in the analysis may lead to more reliability. Items must be duplicated as closely as possible on the pre-and post-test to determine the true relationship between survey items.

Furthermore, the lack of documentation regarding the data may impact the validity of the data in the existing dataset. Team members of Winkelmes (personal communication, September 18, 2022) did not share a code book for the dataset used. Through survey instrumentation and existing documentation, I identified the coding process and developed an independent codebook. This process may have led to the misidentification of codes. At one point in the process, it was difficult to know which questions had been included in the pre-and post-tests as different survey instrumentation included different questions. While I was able to verify the coding for Spring 2019 through Institutional Review Board documentation, I excluded analyses around demographic information that needed to be clarified from available documentation. This additional demographic information, such as racial sub-sets and some religious identification, may have provided insight into the sample composition and results.

Other Limitations

The results found have limited generalizability as the sampling methodology was not truly random. Since faculty served as gatekeepers through this process, the sampling was convenience, cluster sampling. Convenience sampling can present some problems related to generalizability and replication (Creswell, 2014; Groves et al., 2009). In addition to the sampling methodology, the sample composition could be problematic. The sample was significantly overrepresented among trade schools and associate's dominant colleges (98.2%), which might have skewed or affected results compared to prior studies on TILT.

As discussed in response to question one, there is insufficient information about the treatment. This lack of clarity may explain why the findings showed no meaningful difference from the TILT treatment. In addition to a lack of monitoring during the implementation process, a review of the literature reveals inconsistent faculty training experiences. The faculty, who served as gatekeepers and implemented the intervention in the study, received unequal instruction on transparent teaching methods. Whetham et al. (2019) outlined the methodology for faculty training in their Washington study. The authors detail how the workshops "could be facilitated in 50 minutes…or over a period of several hours" (p. 159). Time varied by program request. The unequal instruction could have exacerbated the concerns over fidelity in the study, as faculty may have experienced different comfort levels with the content. Unfortunately, information about which faculty participated in which workshop and the degree to which they used TAD principles in their classrooms is unavailable.

In the case of self-reported data, the actual effect size can be challenging to measure as participants are likely to misrepresent the true impact of an intervention (Bauhoff, 2014). For this research, all outcome measures were self-reported. Participants may have overestimated the degree to which a course helped them develop a specific skill or overrepresented their skills. In cases where self-reported data are collected, using another tool that measures the actual impact can help measure the degree of misrepresentation. Bias in self-reported results is common, and external interventions or knowledge of study participation can amplify the potential for bias (Bauhoff, 2014).

Finally, a significant limitation of my dissertation is that I used secondary research data to address my research question. Initially, I planned to collect original data as part of the SCHEV TILT research team. Unfortunately, the initial study was unsuccessful, primarily due to the

impact of COVID-19. Nevertheless, the partnership with Drs. Fisler and Winkelmes permitted me to continue the investigation into TILT. However, using secondary data significantly limited the control over crucial parts of the research process. It also affected my understanding of how decisions were made when the original research was conducted. Some limitations could have been avoided with additional control and oversight over the data process.

Implications of Findings

Despite some limitations, the findings have important implications for areas of future research and practice. These implications include reexamining the TILT Higher Ed research, focusing on instrumentation development, incorporating transparent design into student employment programs, and addressing gaps in the literature through future research.

Implication #1: Reexamination of TILT

The most considerable contribution of this research is a call for a reexamination of TILT and existing literature on transparent design by the TILT team. Using data provided by the TILT team, I was unable to produce sufficient evidentiary support for assertions from prior research (Winkelmes et al.,2016; Winkelmes et al.,2019) that low-income students benefit from TAD more than their peers. While I found evidence that students participating in a transparent design course experienced a significant increase in their self-reported development of employer-valued skills, the difference between means was not practically meaningful. Furthermore, there were no statistically significant results for academic self-efficacy. I have two recommendations to address concerns with existing TILT research and minimize research errors.

First, a rigorous, independent replication of the study by a research team can work to explore the validity of the research team's findings. Currently, the published findings related to student outcomes include two institutional systems, the University of Nevada and the University

of California system (Howard et al., 2020; Magruder et al., 2019; Winkelmes et al., 2016; Winkelmes et al., 2019). Initial results and findings from the research appear promising, but not all findings could be replicated in this study of Washington State. The results of small case studies also have favorable results (Howard et al., 2020; Humphreys et al., 2019). However, the claims that TILT can work systematically to improve institutional outcomes (persistence) and student outcomes (academic self-efficacy, sense of belonging, employer-valued skills, and academic performance) need further examination. The SCHEV TILT Team had planned to conduct a state-wide study with over 400 faculty participants serving as gatekeepers. While the SCHEV TILT study was unsuccessful due to the COVID-19 pandemic, other researchers and states should consider engaging in a large-scale, independent analysis of transparent design efficacy. The cost and resources to do so are low, with minimal cost to the institution and potential benefits to faculty (Hebert et al., 2022; Magruder et al., 2019; Tarr et al., 2019).

My second recommendation is to create a new research instrument. Given the numerous issues with instrumentation, a Type I error may be occurring. A Type I error occurs when researchers believe a significant result has been found when no significant relationship exists. A new instrument could mitigate some of these concerns. Creswell (2014) suggests developing a research instrument through grounded theory research, identifying constructs for inclusion on the survey instrument and developing items, conducting tests for internal reliability, and measuring criterion-referenced validity (Creswell, 2014).

Strengthening the instrument used to collect data could also identify if there are confounding variables producing favorable results in specific environments. For example, a significant amount of TILT research with positive results takes place in large, introductory classes with primarily first-year and second-year students (Howard et al., 2020; Magruder et al.,

2019; Winkelmes et al., 2016; Winkelmes et al., 2019). Is the impact of TILT being misattributed and, in fact, partially caused by the natural development students experience in higher education? Does it have to do with the type of student who would enroll in this course? Or would students use metacognitive practices without faculty adopting TILT, leading to the same outcomes? These are additional questions and factors worth exploring as research on TAD continues.

Implication #2: Recommendations for Practice

Although not all findings were significant, the literature review and findings led to one recommendation for practice. The findings showed that students participating in transparently designed courses experienced statistically significant growth in employer-valued skill development. Since the difference in means could have been more meaningful, I hesitate to recommend transparent design to enhance employer-valued skill development for in-person instruction. However, the finding does align with recommendations for virtual settings by Humphreys et al. (2019). Therefore, as student affairs practitioners and on-campus employers consider their student training and assessment programs, transparent design should be considered a framework. Due to its foundation in metacognitive practices, a transparent design framework can enhance employer-valued skills development for students. Additional quantitative research will be needed to measure the impact and explore this recommendation's potential.

At the University of Nevada Las Vegas, several employment programs shifted to use transparent design and articulate clear measures of success. For example, the purpose-task-criteria framework of the transparent design formed the basis for student staff performance evaluations and self-reflections (Humphreys et al., 2019). In addition, Student Affairs units used the framework to rewrite position descriptions with a shared purpose statement, metrics for

success, and required tasks (Humphreys et al., 2019). Other employment programs which use metacognitive practices also report positive outcomes related to student employer-valued skill development (Peck et al., 2016; Schnelle, 2021).

Recognizing that faculty buy-in to new teaching methods can be challenging and require institutional commitments to specific development programs (Magruder et al., 2019; Tarr et al., 2019), education leaders should consider how to achieve the same goals beyond the classroom. Applying transparent design principles to student employment and leadership programs can also grow this skill set without necessitating faculty buy-in.

Implication #3: Additional Future Research

The literature review and research findings raised additional questions about the impact of transparent design that falls beyond TILT Higher Ed's current work. As discussed in the literature review, the relationship between SES and the development of employer-valued skills needs more research. The literature primarily focuses on the relationship between SES and career self-efficacy among college students (Kezar & Kitchen, 2020; Pulliam et al., 2017). The relationship between transparent design and the barriers associated with unemployment, including career path knowledge and career self-efficacy, is currently unknown. While developing employer-valued skills is essential, it does not support student career exploration or professional development (Kezar & Kitchen, 2020). Future assessments on transparent design should consider ways to improve these skills for low-income students. Academic self-efficacy is already a part of the framework for transparent teaching and could be easily expanded to incorporate elements of career self-efficacy. Taking initial steps to eliminate the traditional barriers to low-income student professional success could improve long-term outcomes for these students. The potential economic impact could be significant with the focus on employer-valued

skills and career self-efficacy. Additional research is needed to prove the efficacy and viability of this model.

All research cited in this paper was conducted prior to the COVID-19 pandemic. The initial results from a quasi-experimental study from one course at UNLV found evidence that transparent teaching can improve academic performance in online courses (Howard et al., 2020). This class modality is important as online and hybrid course offerings have become more prominent since the COVID-19 pandemic. Faculty without online instruction experience had low levels of teaching effectiveness as the pandemic began (Hebert et al., 2022). Over the past two years, experience, training, and mentoring have led to a shift. Those same faculty with initially low effectiveness report enhanced facilitation skills, improved teaching effectiveness, and a more positive attitude toward online instruction (Hebert et al., 2022). Online courses are likely to continue growing in popularity, and future research should explore the impact of transparent teaching in online learning environments. As students enter higher education with virtual learning experiences, the needs of a virtual classroom environment may change (Hebert et al., 2022). All courses analyzed in this study were offered in person. Future researchers could consider how the effectiveness of transparent instruction may vary based on institutional type, level of course offering, and instructor comfort with online instruction.

Conclusion

This study explored the impact of participation in a transparently designed course on students' self-reported academic self-efficacy and employer-valued skills development. Chapters 1 and 2 provided an overview of the problems facing low-income student success in higher education and the framework of transparent design. Chapter 2 additionally highlighted relevant literature related to Bandura's (1997) social cognitive theory and prior research on transparent

design, self-efficacy, and employer-valued skills. The methodology, including sample and instrumentation, is presented in detail in Chapter 3. Chapter 4 presents the statistical analysis and findings. The study had several limitations which may have affected the research results. These limitations and implications of the findings are discussed in Chapter 5.

Participation in a transparently designed course did not significantly affect the development of academic self-efficacy. Participation in transparently designed courses did have a significant impact on the development of employer-valued skills. However, there was no significant difference in gains between low-income students and their peers. These findings, in the context of the literature review and conceptual framework, suggest that transparent design can have important implications for student employment programs. Due to limitations with instrumentation, the study raises concerns about the true impact of TILT Higher Ed. More research on transparent design and a reexamination of past findings is recommended. In addition, research is needed in other areas related to low-income students. Gaps in the literature relate to employer-valued skill development beyond the classroom, low-income student career self-efficacy, and the relationship between SES and academic self-efficacy. Enhanced knowledge about the low-income student experience and the impact of transparent teaching methods can support institutional decision-making. The results of this study do not indicate practical implications for transparent design. However, it is a low-resource intervention that could potentially improve student outcomes. Transparent design should be reexamined if improvements are made to the monitoring, training, and instrumentation.

REFERENCES

Allison, T., & Mairead, C. (2022). *Enrollment trends among Pell Grant recipients*. State Council for Higher Education of Virginia. https://www.schev.edu/Home/Components/News/News/196/

Alota, B. T. (2021). *Increasing the self-efficacy and college graduation rates of first-generation, low-income students* [Doctoral dissertation, Vanderbilt University]. Vanderbilt University Institutional Repository. https://ir.vanderbilt.edu/handle/1803/17020

Anderson, S. L., & Betz, N. E. (2001). Sources of social self-efficacy expectations: Their measurement and relation to career development. *Journal of vocational behavior, 58*(1), 98-117. https://doi.org/10.1006/jvbe.2000.1753

Bandura A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, *84*(2), 191–215. https://doi.org/10.1037/0033-295x.84.2.191

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Prentice-Hall.

Bandura A. (1997). *Self-efficacy in changing societies*. Cambridge University Press.

Barr, R. B., & Tagg, J. (1995). From teaching to learning—A new paradigm for undergraduate education. *Change: The Magazine of Higher Learning*, *27*(6), 12-26. https://doi.org/10.1080/00091383.1995.10544672

Bauhoff, S. (2014). The effect of school district nutrition policies on dietary intake and overweight: a synthetic control approach. *Economics & Human Biology, 12*, 45-55. https://doi.org/10.1016/j.ehb.2013.06.001

Board of Governors (2022). *2022 performance-based funding: Metric scores and allocations*. https://www.flbog.edu/wp-content/uploads/2023/04/PBF-Information-2022-23.pdf

Bong, M., & Clark, R. E. (1999). Comparison between self-concept and self-efficacy in academic motivation research. *Educational Psychologist, 34*(3), 139-153. https://doi.org/10.1207/s15326985ep3403_1

Bong, M., & Skaalvik, E. M. (2003). Academic self-concept and self-efficacy: How different are they really? *Educational Psychology Review, 15,* 1-40. https://doi.org/10.1023/A:1021302408382

Brand, J. E., & Xie, Y. (2010). Who benefits most from college? Evidence for negative selection in heterogeneous economic returns to higher education. *American sociological review*, *75*(2), 273-302. https://doi.org/10.1177/0003122410363567

Bridgstock, R. (2009). The graduate attributes we've overlooked: Enhancing graduate employability through career management skills. *Higher Education Research & Development*, *28*(1), 31-44. https://doi.org/10.1080/07294360802444347

Broady, K., & Hershbein, B. (2020, October 8). *Major decisions: What graduates earn over their lifetimes.* Brookings Institute. https://www.brookings.edu/blog/up-front/2020/10/08/major-decisions-what-graduates-earn-over-their-lifetimes/

Brown, M. (2021, January 22). *2021-2022 federal Pell Grant payment and disbursement schedule.* Federal Student Aid, U.S. Department of Education. https://fsapartners.ed.gov/knowledge-center/library/dear-colleague-letters/2021-01-22/2021-2022-federal-pell-grant-payment-and-disbursement-schedules

Cahalan, M. W., Addison, M., Brunt, N., Patel, P. R., & Perna, L. W. (2021). *Indicators of higher education equity in the United States: 2021 historical trend report.* Pell Institute for the Study of Opportunity in Higher Education. https://files.eric.ed.gov/fulltext/ED613170.pdf

Cañabate, D., Serra, T., Bubnys, R., & Colomer, J. (2019). Pre-service teachers' reflections on cooperative learning: Instructional approaches and identity construction. *Sustainability, 11*(21), 59–70. https://doi.org/10.3390/su11215970

Capa-Aydin, Y., Uzuntiryaki-Kondakci, E., & Ceylandag, R. (2018). The relationship between vicarious experience, social persuasion, physiological state, and chemistry self-efficacy: The role of mastery experience as a mediator. *Psychology in the Schools*, *55*(10), 1224-1238. https://doi.org/10.1002/pits.22201

Carnevale, A.P., & Smith, N. (2018). *Balancing work and learning: Implications for low-income students*. Center on Education and the Workforce. https://repository.library.georgetown.edu/bitstream/handle/10822/1052638/Low-Income-Working-Learners-FR.pdf?sequence=1

Chan, C., (2012). Exploring an experiential learning project through Kolb's Learning Theory using a qualitative research method. *European Journal of English Education, 37*(4), 405–415. https://doi.org/10.1080/03043797.2012.706596

Chan, F. E. T. Y., Luk, L. Y. Y., & Ho, R. (2017). A review of literature on challenges in the development and implementation of generic competencies in higher education curriculum. *International Journal of Educational Development*, *57*, 1–10. https://doi.org/10.1016/j.ijedudev.2017.08.010

Chetty, R., Grusky, D., Hell, M., Hendren, N., Manduca, R., & Narang, J. (2017). The fading American dream: Trends in absolute income mobility since 1940. *Science, 356*(6336), 398-406. https://doi.org/ 10.1126/science.aal4617

Cottrill, N. M. (2018). *Mediating effect of academic self-efficacy between teachers' attitudes and achievement of low-income high school students* [Unpublished doctoral dissertation]. Walden University. https://scholarworks.waldenu.edu/dissertations/5691/

Creswell, J. W. (2014). *Research design: Qualitative, quantitative and mixed methods approaches* (4th ed.). Sage.

Dennis, J. M., Phinney, J. S., & Chuateco, L. I. (2005). The role of motivation, parental support, and peer support in the academic success of ethnic minority first-generation college students. *Journal of College Student Development, 46*(3), 223-236. https://doi.org/10.1353/csd.2005.0023

Department of Education (2023). *College Scorecard.* https://collegescorecard.ed.gov/

Dinther, M. V., Dochy, F., & Segers, M. S. (2011). Factors affecting students' self-efficacy in higher education. *Educational Research Review, 6*, 95–108. https://doi.org/10.1016/j.edurev.2010.10.003

Dortch, C. (2018). *The TRIO programs: A primer* (CRS Report No. 4274). Congressional Research Service. https://crsreports.congress.gov/product/pdf/R/R42724/15

Dynarski, S., Libassi, C. J., Michelmore, K., & Owen, S. (2018). *Closing the gap: The effect of a targeted, tuition-free promise on college choices of high-achieving, low-income students* (No. w25349). National Bureau of Economic Research. https://www.nber.org/papers/w25349

Dynarski, S. M., & Scott-Clayton, J. E. (2007). *Complexity and targeting in federal student aid: A quantitative analysis.* Kennedy School of Government, Harvard University. https://doi.org/10.2139/ssrn.1083721

Elias, S. M., & MacDonald, S. (2007). Using past performance, proxy efficacy, and academic self-efficacy to predict college performance. *Journal of Applied Social Psychology, 37,* 2518-2531. https://doi.org/10.1111/j.1559-1816.2007.00268.x

Engle, J., & Tinto, V. (2008). *Moving beyond access: College success for low-income, first-generation students.* Pell Institute for the Study of Opportunity in Higher Education.

Executive Office of the President. (2017). *Economic report of the President.* https://obamawhitehouse.archives.gov/sites/default/files/docs/2017_economic_report_of_president.pdf

Fink, L. D. (2013). *Creating significant learning experiences: An integrated approach to designing college courses*. John Wiley & Sons.

Gibb, S. A. (1992). *Evaluating first-year education students for retention and application of knowledge through a comparison of two teaching strategies: the lecture method and teaching-for-learning*. Brigham Young University.

Goldrick-Rab, S. (2016). *Paying the price: College costs, financial aid, and the betrayal of the American dream*. University of Chicago Press. https://doi.org/10.7208/chicago/9780226404486.001.0001

Goodenow, C. (1993). Classroom belonging among early adolescent students: Relationships to motivation and achievement. *Journal of Early Adolescence, 13*(1), 21–43. https://doi.org/10.1177/0272431693013001002

Groves, R., Fowler, F. J., Couper, M., Lepkowski, J. M., Singer, E., & Tourangeau, R. (2009). *Survey methodology* (2nd ed.). Wiley.

Hacker, D. J., Dunlosky, J., & Graesser, A. C. (Eds.). (1998). *Metacognition in educational theory and practice*. Routledge.

Hamilton, L. T. (2013). More is more or more is less? Parental financial investments during college. *American Sociological Review, 78*, 70 –95. https://doi.org/10.1177/0003122412472680

Hebert, E., Wood, R., Jeon, K., & Reena, I. (2022). Faculty making the emergency online transition during the COVID-19 pandemic: The effects of prior online teaching experience and strategies used to learn to teach online. *Higher Learning Research Communications, 12*(0), 59–76. https://doi.org/10.18870/hlrc.v12i0.1322

Honicke, T., & Broadbent, J. (2016). The influence of academic self-efficacy on academic performance: A systematic review. *Educational Research Review*, *17*, 63-84. https://doi.org/10.1016/j.edurev.2015.11.002

Howard, T. O., Winkelmes, M. A., & Shegog, M. (2020). Transparency teaching in the virtual classroom: Assessing the opportunities and challenges of integrating transparency teaching methods with online learning. *Journal of Political Science Education*, *16*(2), 198-211. https://doi.org/10.1080/15512169.2018.1550420.

Humphreys, K., Winkelmes, M., Gianoutsos, D. Mendenhall, A., Farrar, E., Bowles-Terry, M., Juneau-Butler, G., Cheek, D., Fields, L., Sully, G. M., Calkins, C., Yu, K., & Gittens., S. (2019). Transparency in faculty development collaborations at a minority-serving research university. In M. Winkelmes, A. Boye, & S. Tapp (Eds.), *Transparent design in higher education teaching and leadership* (pp. 185-199). Stylus.

Hurtado, S., & Carter, D. F. (1997). Effects of college transition and perceptions of the campus racial climate on Latino college students' sense of belonging. *Sociology of Education, 70*, 324 –345. https://doi.org/10.2307/2673270

Jacoby, B., & Garland, J. (2004). Strategies for enhancing commuter student success. *Journal of College Student Retention: Research, Theory, and Practice, 6*(1), 61–79. https://doi.org/10.2190/567C-5TME-Q8F4-8FRG

Jenkins, S. R., Belanger, A., Connally, M. L., Boals, A., & Durón, K. M. (2013). First-generation undergraduate students' social support, depression, and life satisfaction. *Journal of College Counseling, 16*(2), 129-142. https://doi.org/10.1002/j.2161-1882.2013.00032.x

Kaufman, D., Sutow, E., & Dunn, K. (1997). Three approaches to cooperative learning in higher education. *Canadian Journal of Higher Education, 27*(2/3), 37-66. https://doi.org/10.47678/cjhe.v27i2/3.183303

Kezar, A., & Kitchen, J. A. (2020). Supporting first-generation, low-income, and underrepresented students' transitions to college through comprehensive and integrated programs. *American Behavioral Scientist, 64*(3), 223-229. https://doi.org/10.1177/0002764219869397

Khan, A. S., Cansever, Z., Avsar, U. Z., & Acemoglu, H. (2013). Perceived self-efficacy and academic performance of medical students at Ataturk University, Turkey. *Journal of the College of Physicians and Surgeons Pakistan, 23,* 495-498. https://doi.org/07.2013/JCPSP.495498

King, A. (1991). Improving lecture comprehension: Effects of a metacognitive strategy. *Applied Cognitive Psychology, 5*(4), 331-346. https://doi.org/10.1002/acp.2350050404

Kiess, H. O., & Green, B. A. (2019). *Statistical concepts for the behavioral sciences*. Cambridge University Press.

Komarraju, M., & Nadler, D. (2013). Self-efficacy and academic achievement: Why do implicit beliefs, goals, and effort regulation matter? *Learning and Individual Differences, 25*, 67-72. https://doi.org/10.1016/j.lindif.2013.01.005

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. Educational and Psychological Measurement, 30(3), 607–610. https://doi.org/10.1177/001316447003000030

Ma, J. & Pender, M. (2021). *Trends in college pricing and student aid.* CollegeBoard. https://research.collegeboard.org/pdf/trends-college-pricing-student-aid-2021.pdf

Magruder, E., Scott, W., Willard, M., Ruiz-Mesa, K., & Drew, S. (2019). Transparency to close opportunity gaps in the largest state system. In M. Winkelmes, A. Boye, & S. Tapp (Eds), *Transparent design in higher education teaching and leadership* (pp. 166-184). Stylus.

Maropamabi, G. (2014). Role of self-efficacy and self-esteem in academic performance. *European Journal of Educational Sciences*, *2*(2), 8-22. https://doi.org/10.14295/bjs.v2i9.357

Mason, L., Boldrin, A., & Ariasi, N. (2010). Epistemic metacognition in context: evaluating and learning online information. *Metacognition and learning*, *5*(1), 67-90. https://doi.org/10.1007/s11409-009-9048-2

McClure, K., & Ryder, A. J. (2018). The costs of belonging: How spending money influences social relationships in college. Journal of Student Affairs Research and Practice, 55(2), 196-209. https://doi.org/10.1080/19496591.2017.1360190

McMillan, D. W., & Chavis, D. M. (1986). Sense of community: A definition and theory. *Journal of Community Psychology, 14*, 6–23. https://doi.org/10.1002/1520-6629(198601)14:1<6::AID-JCOP2290140103>3.0.CO;2-I

Means, D. R., & Pyne, K. B. (2017). Finding my way: Perceptions of institutional support and belonging in low-income, first-generation, first-year college students. *Journal of College Student Development, 58*(6), 907-924. https://doi.org/ 10.1353/csd.2017.0071

Millea, M., Wills, R., Elder, A., & Molina, D. (2018). What matters in college student success? Determinants of college retention and graduation rates. *Education, 138*(4), 309-322. https://doi.org/10.1177/1521025119875104

Millis, B. J., & Cottell Jr, P. G. (1997). *Cooperative learning for higher education faculty*. *Series on Higher Education*. Oryx Press.

Moely, B. E., Santulli, K. A., & Obach, M. S. (1995). Strategy instruction, metacognition, and motivation in the elementary school classroom. In F. E. Weinert & W. Schneider (Eds.), *Memory performance and competencies: Issues in growth and development* (pp. 301-321). Psychology Press.

National Center for Education Statistics. (2022a). *Integrated postsecondary education data system (IPEDS), [2010-2019]*. https://nces.ed.gov/ipeds/use-the-data

National Center for Education Statistics. (2022b). *Young adult educational and employment outcomes by family socioeconomic status.* https://nces.ed.gov/programs/coe/indicator/tbe

Northouse, P. G. (2021). *Leadership: Theory and practice*. Sage Publications.

Nguyen, D. J., & Herron, A. (2021). Keeping up with the joneses or feeling priced out?: Exploring how low-income students' financial position shapes sense of belonging. *Journal of Diversity in Higher Education, 14*(3), 429–440. https://doi.org/10.1037/dhe0000191

Panadero, E., Jonsson, A., & Botella, J. (2017). Effects of self-assessment on self-regulated learning and self-efficacy: Four meta-analyses. *Educational Research Review, 22*, 74-98. https://doi.org/10.1016/j.edurev.2017.08.004

Pajares, F. (1997). Current direction in self-efficacy research. In M. Maehr & P. R. Pintrich (Eds.), *Advances in Motivation and Achievement* (10th ed., pp.1-49). JAI Press.

Pajares, F. & Urdan, T. (2006). *Self-efficacy beliefs of adolescents.* IAP.

Patton, L. D., Crenshaw, K., Haynes, C., & Watson, T. N. (2016). Why we can't wait:(Re) examining the opportunities and challenges for Black women and girls in education (Guest Editorial). *The Journal of Negro Education, 85*(3), 194-198.

Peck, A., Hall, D., Cramp, C., Lawhead, J., Fehring, K., & Simpson, T. (2016). The co-curricular connection: The impact of experiences beyond the classroom on soft skills. *NACE Journal, 76*(3), 30-34. https://career.sites.clemson.edu/symposium/The_Cocurricular_Connection_2016.pdf

Pulliam, N., Ieva, K. P., & Burlew, L. (2017). The relationship between perceived career barriers and career decision self-efficacy on initial career choice among low-income, first generation, pre-freshman, college-bound students. *Journal of College Access, 3*(2), 78-97. http://scholarworks.wmich.edu/jca/vol3/iss2/7

Pyne, K. B., & Means, D. R. (2013). Underrepresented and in/visible: A Hispanic first-generation student's narratives of college. *Journal of Diversity in Higher Education, 6*, 186-198. https://doi.org/10.1037/a0034115

Reber, S., & Sinclair, C. (2020). *Opportunity engines: Middle-class mobility in higher education*. Brookings Institute. https://vtechworks.lib.vt.edu/bitstream/handle/10919/98982/OpportunityEnginesFinal.pdf

Richardson, M., Abraham, C., & Bond, R. (2012). Psychological correlates of university students' academic performance: a systematic review and meta-analysis. *Psychological bulletin*, *138*(2), 353. https://doi.org/10.1037/a0026838

Robbins, S. B., Lauver, K., Le, H., Davis, D., Langley, R., & Carlstrom, A. (2004). Do psychosocial and study skill factors predict college outcomes? A meta-analysis. *Psychological Bulletin*, *130*(2), 261. https://doi.org/ 10.1037/a0026838.

Römgens, I., Scoupe, R., & Beausaert, S. (2020). Unraveling the concept of employability, bringing together research on employability in higher education and the workplace. *Studies in Higher Education*, *45*(12), 2588-2603. https://doi.org/10.1080/03075079.2019.1623770

Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs: General and Applied*, *80*(1), 1–28. https://doi.org/10.1037/h0092976

Sablan, J. R. (2014). The challenge of summer bridge programs. *American Behavioral Scientist*, *58*(8), 1035-1050. https://doi.org/10.1177/0002764213515234

Sawchuk, S. (2018). Students of color face persistent disparities in access to advanced STEM courses. *Education Week*. http://blogs.edweek.org/edweek/curriculum/2018/04/persistent_disparities_in_stem_coursetaking_crdc.html

Schunk, D. H. (1991). Self-efficacy and academic motivation. *Educational Psychologist, 26*(3-4), 207-231. https://doi.org/10.1080/00461520.1991.9653133

Schunk, D. H. (2003). Self-efficacy for reading and writing: Influence of modeling, goal setting, and self-evaluation. *Reading &Writing Quarterly, 19*(2), 159-172. https://doi.org/10.1080/10573560308219

Schnelle, T. (2021). *2021 student employee survey summary*. University of Iowa Division of Student Life. https://studentlife.uiowa.edu/sites/studentlife.uiowa.edu/files/imports/Iowa-GROW-Student-Employee-Survey-Summary-Update-2021.pdf

Schraw, G. (1998). Promoting general metacognitive awareness. *Instructional Science, 26*(1), 113-125. https://doi.org/10.1023/A:1003044231033

Smith, J. G. (2006). Parental involvement in education among low-income families: A case study. *School Community Journal, 16*(1), 43-56.

Soria, K. M., Stebleton, M. J., & Huesman, R. L., Jr. (2013). Class counts: Exploring differences in academic and social integration between working-class and middle/upper-class students at large, public research universities. *Journal of College Student Retention: Research, Theory & Practice, 15*, 215–242. https://doi.org/10.2190/CS.15.2.e

State Council of Higher Education for Virginia. (2020). *The Virginia Plan goals*. https://schev.edu/index/statewide-strategic-plan/goals.

Strayhorn, T. L. (2019). *College students' sense of belonging: A key to educational success for all students.* Routledge.

Tarr, T., Baker, R., & Johnson, K. (2019). Transparent instruction in a statewide higher education network. In M. Winkelmes, A. Boye, & S. Tapp (Eds.), *Transparent design in higher education teaching and leadership* (pp. 185-199). Stylus.

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education, 2*, 53–55. https://doi.org/10.5116/ijme.4dfb.8dfd

Tinto, V. (2002). Enhancing student persistence: Connecting the dots. University of Wisconsin.

Tinto, V. (2007). *Taking student retention seriously*. Syracuse University.

Tinto, V. (2017). Reflections on student persistence. *Student Success, 8*(2), 1-8. https://doi.org/10.5204/ssj.v8i2.376

Uzuntiryaki, E. (2008). Exploring the sources of Turkish pre-service chemistry teachers' chemistry self-efficacy beliefs. *Australian Journal of Teacher Education (Online)*, *33*(6), 12-28. https://doi.org/10.14221/ajte.2008v33n6.2

Vaccaro, A., & Newman, B. M. (2016). Development of sense of belonging for privileged and minoritized students: An emergent model. *Journal of College Student Development, 57,* 925–942. https://doi.org/10 .1353/csd.2016.0091

Wallace, B., & Kernozek, T. (2017). Self-efficacy theory applied to undergraduate biomechanics instruction. *The Journal of Hospitality, Leisure, Sport & Tourism Education, 20,* 10–15. https://doi.org/10.1016/j.jhlste.2016.11.001

Webb, N. M., Franke, M. L., De, T., Chan, A. G., Freund, D., Shein, P., & Melkonian, D. K. (2009). 'Explain to your partner': Teachers' instructional practices and students' dialogue in small groups. *Cambridge Journal of Education, 39*(1), 49-70. https://doi.org/10.1080/03057640802701986

Whetham, J., Darley-Vanis, J., Heilstedt, S., Boye, A., Tapp, S., & Winkelmes, M. (2019). Transparency and the Guided Pathways Model: Ensuring equitable learning opportunities for students in community and technical colleges. In M. Winkelmes, A. Boye, & S. Tapp (Eds.), *Transparent design in higher education teaching and leadership* (pp. 185-199). Stylus.

Williamson, G. (2015). Self-regulated learning: an overview of metacognition, motivation and behavior. *Journal of Initial Teacher Inquiry, 1*(1), 25-17. https://doi.org/10.26021/851

Winkelmes, M. (2019a). Introduction: The story of TILT and its emerging uses for higher education. In M. Winkelmes, A. Boye, & S. Tapp (Eds.), *Transparent design in higher education teaching and leadership* (pp. 1-17). Stylus. https://doi.org/10.4324/9781003448396-1

Winkelmes, M. (2019b). Why it works: Understanding the concepts behind transparency in learning and teaching. In M. Winkelmes, A. Boye, & S. Tapp (Eds.), *Transparent design in higher education teaching and leadership* (pp. 17-35). Stylus. https://doi.org/10.4324/9781003448396-1

Winkelmes, M. A., Bernacki, M., Butler, J., Zochowski, M., Golanics, J., & Weavil, K. H. (2016). A teaching intervention that increases underserved college students' success. *Peer Review*, *18*(1/2), 31-36.

Winkelmes, M. A., Boye, A., & Tapp, S. (2019). *Transparent design in higher education teaching and leadership: A guide to implementing the transparency framework institution-wide to improve learning and retention*. Stylus.

Zimmerman, B. J., & Cleary, T. J. (2006). Adolescents' development of personal agency: The role of self-efficacy beliefs and self-regulatory skill. In F. Pajares & T. Urdan (Eds.) *Self-efficacy beliefs of adolescents* (pp. 45-69). Information Age.

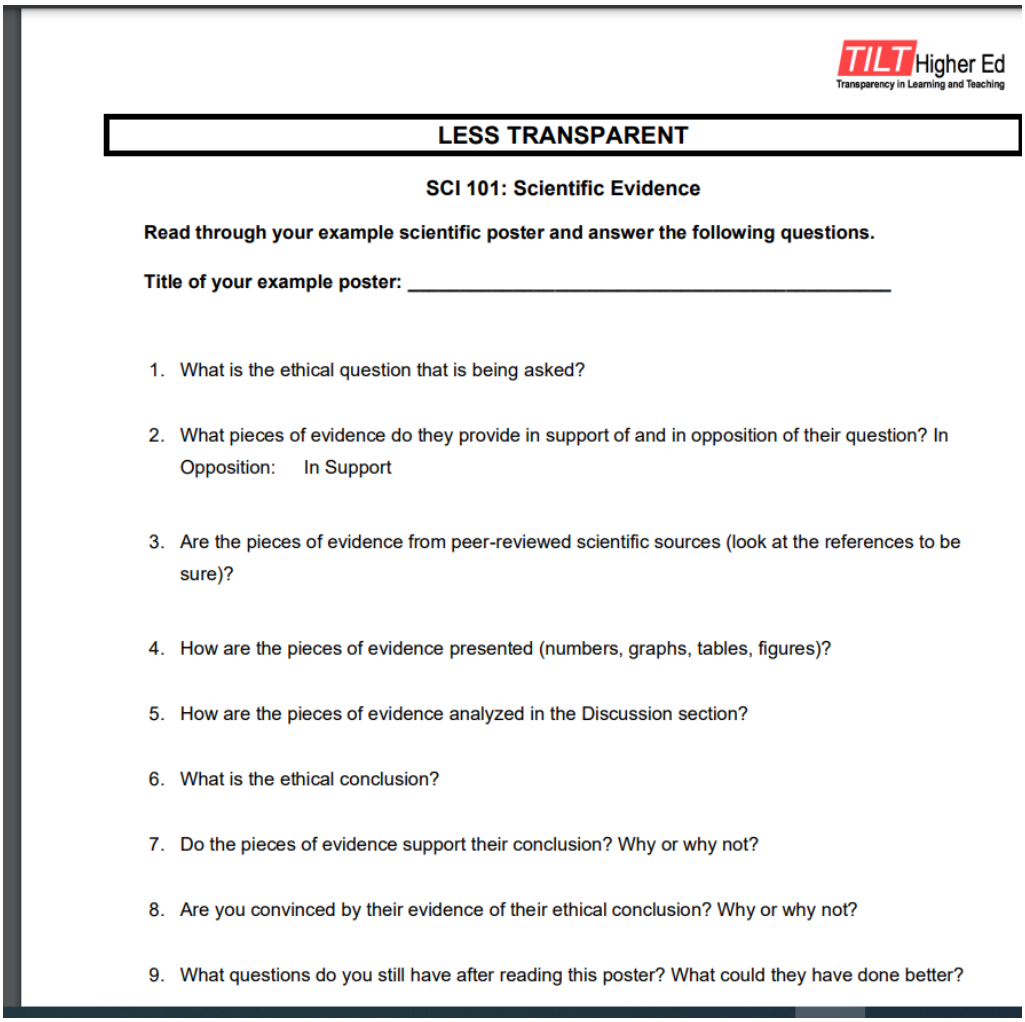
Zhou, E., & Mendoza, P. (2017). Financing higher education in the United States: A historical overview of loans in federal financial aid policy. In *The Neoliberal Agenda and the Student Debt Crisis in US Higher Education* (pp. 3-18). Routledge. https://doi.org/10.4324/9781315638768-1

Appendix A

Example of Transparent Assignment Design

Figure 2

Less transparent assignment for science course



TILT Higher Ed
Transparency in Learning and Teaching

LESS TRANSPARENT

SCI 101: Scientific Evidence

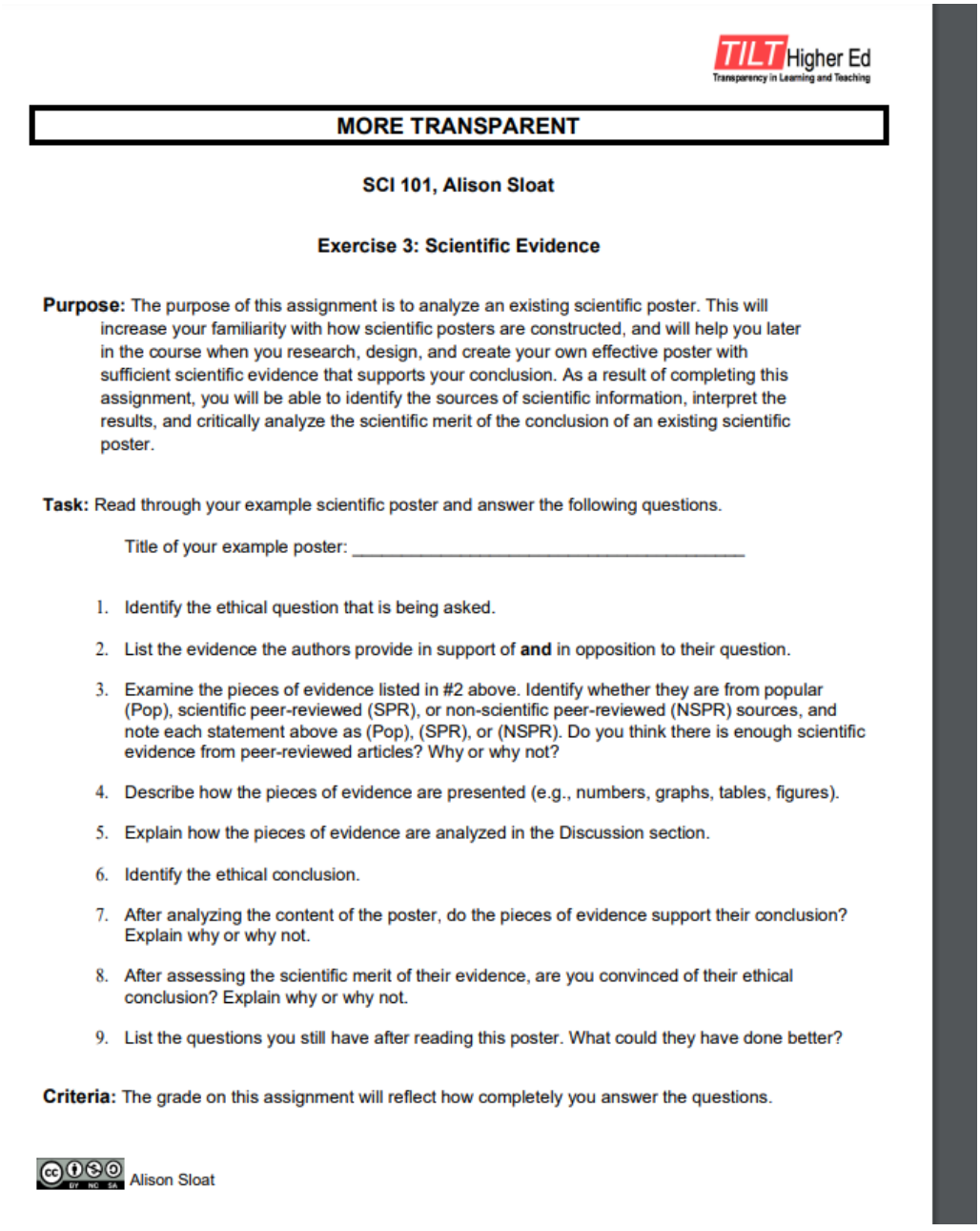
Read through your example scientific poster and answer the following questions.

Title of your example poster: _____

1. What is the ethical question that is being asked?
2. What pieces of evidence do they provide in support of and in opposition of their question? In Opposition: In Support
3. Are the pieces of evidence from peer-reviewed scientific sources (look at the references to be sure)?
4. How are the pieces of evidence presented (numbers, graphs, tables, figures)?
5. How are the pieces of evidence analyzed in the Discussion section?
6. What is the ethical conclusion?
7. Do the pieces of evidence support their conclusion? Why or why not?
8. Are you convinced by their evidence of their ethical conclusion? Why or why not?
9. What questions do you still have after reading this poster? What could they have done better?

Figure 3

More transparent assignment for science course



TILT Higher Ed
Transparency in Learning and Teaching

MORE TRANSPARENT

SCI 101, Alison Sloat

Exercise 3: Scientific Evidence

Purpose: The purpose of this assignment is to analyze an existing scientific poster. This will increase your familiarity with how scientific posters are constructed, and will help you later in the course when you research, design, and create your own effective poster with sufficient scientific evidence that supports your conclusion. As a result of completing this assignment, you will be able to identify the sources of scientific information, interpret the results, and critically analyze the scientific merit of the conclusion of an existing scientific poster.

Task: Read through your example scientific poster and answer the following questions.

Title of your example poster: _____

1. Identify the ethical question that is being asked.
2. List the evidence the authors provide in support of **and** in opposition to their question.
3. Examine the pieces of evidence listed in #2 above. Identify whether they are from popular (Pop), scientific peer-reviewed (SPR), or non-scientific peer-reviewed (NSPR) sources, and note each statement above as (Pop), (SPR), or (NSPR). Do you think there is enough scientific evidence from peer-reviewed articles? Why or why not?
4. Describe how the pieces of evidence are presented (e.g., numbers, graphs, tables, figures).
5. Explain how the pieces of evidence are analyzed in the Discussion section.
6. Identify the ethical conclusion.
7. After analyzing the content of the poster, do the pieces of evidence support their conclusion? Explain why or why not.
8. After assessing the scientific merit of their evidence, are you convinced of their ethical conclusion? Explain why or why not.
9. List the questions you still have after reading this poster. What could they have done better?

Criteria: The grade on this assignment will reflect how completely you answer the questions.

APPENDIX B

TILT HIGHER ED SURVEY

1. How well do you understand the content of this course?
2. How accurately does your submitted work for the course (including exams/quizzes) reflect your understanding of the course content?
3. Did the coursework and course activities benefit your learning?
4. How much has this course helped you in writing effectively?
5. How much has this course helped you in communicating your ideas effectively in your spoken statements?
6. How much has this course helped you in collaborating effectively with others?
7. How much has this course helped you in improving your ability to separate and examine the pieces of an idea, experience, or theory?
8. How much has this course helped you in learning how to connect information from a variety of sources?
9. How much has this course helped you in learning how to apply concepts to practical problems or in new situations?
10. How much has this course helped you in considering the ethical implications of your actions?
11. How much has this course helped you in improving your ability to learn effectively on your own?
    a. Response options: Not at all, A little, A moderate amount, A lot, A great deal
12. I can express my ideas effectively when I write.
13. I can communicate effectively when I speak.
14. I collaborate well with others on academic work.
15. I am good at breaking down the ones, ideas and experiences into pieces so I can consider them.
16. When I am given information from multiple sources, I have an easy time making connections between them.
17. I am able to apply the things I have learned to new problems and situations.
18. I tend to consider the ethical implications of my actions.
19. I am capable of learning on my own.
    a. Response options: Never, Sometimes, Often, Always
20. Please rate your confidence about your ability to succeed in school.
21. Please rate your confidence about your ability to succeed in this field.
    a. Response options: Low, Moderate, High

22. As a result of taking this course are you more or less likely to consider opinions or points of view different from your own or has the course made no difference?
    a. Response options: Much less likely, Somewhat less likely, No difference, Somewhat more likely, Much more likely
23. As a result of taking this course are you a better or worse judge of the strength and weaknesses of ideas, or has the course made no difference?
24. As a result of taking this course are you a better or worse judge of how well a group discussion has met its goals, or has the course made no difference?
25. As a result of taking this course are you a better or worse judge of the reliability of information from various sources or has the course made no difference?
    a. Response options: Much worse, Somewhat worse, No difference, Somewhat Better, Much Better
26. As a result of taking this course are you more or less confident about your ability to succeed in school, or has the course made no difference?
27. As a result of taking this course are you more or less confident about your ability to succeed in this field, or has the course made no difference?
    a. Response options: Much less confident, somewhat less confident, No difference, Somewhat more confident, Much more confident
28. As a result of taking this course are you better or worse at recognizing when you need help with your academic work, or has the course made no difference?
    a. Much worse, Somewhat worse, No difference, Somewhat Better, Much Better
29. As a result of taking this course are you more or less likely to discuss ideas from your courses, outside of class with others such as students, family members, or co-workers, or has the course made no difference?
30. As a result of taking this course are you more or less likely to ask future instructor about how coursework and course activities benefits your learning, or has the course made no difference?
    a. Response options: Much worse, Somewhat worse, No difference, Somewhat Better, Much Better
31. Are you likely to apply knowledge and skills you gained from this course in contexts outside of this course?
    a. Not likely, Slightly likely, Moderately likely, very likely, Extremely likely
32. How well do you understand what constitutes successful work in this course?
    a. Not well at all, Slightly well, Moderately well, Very well, Extremely well
33. How much did class meetings incorporate the student's suggestions and interests?
    a. Not at all, A little, A moderate amount, A lot, A great deal
34. How much did the instructor value you as a student?
    a. No at all, A little, A moderate amount, A lot, A great deal

35. In this course, I knew the purpose of each assignment.
36. Each assignment included a section that explained how the assignment was related to the objectives of the course.
37. My instructor identified a specific learning goal for each assignment.
38. In this course, I knew the steps required to complete my assignments.
39. Each assignment included a detailed set of instructor for completing it.
40. My instructor provided detailed directions for each learning activity that was assigned.
41. In this course, I knew how my work would be evaluated.
42. My instructor provided students with annotated examples of past students' work.
43. My instructor provided tools I could use to assess the quality of my and others' work.
    a. Response options: Never, Sometimes, Often, Always
44. How much has this course helped you in designing experiments or processes to address a problem?
45. How much has this course helped you in analyzing and interpreting data and/or problems?
46. How much has this course helped you in choosing methods appropriate to solving a problem?
    a. Response options: Not at all, A little, A moderate amount, A lot, A great deal
47. I feel that I am a member of my school's community:
    a. Response options: Never, Sometimes, Often, Always
48. How much has this course helped you to feel that you are a member of your school's community?

    Response options: Not at all, A little, A moderate amount, A lot, A great deal

DEMOGRAPHIC QUESTIONS

49. What is your gender?
    a. Response options:
    b. Male,
    c. Female,
    d. I prefer not to respond,
    e. Additional: Please describe

    how you identify your gender.
50. Before taking this course, did you complete any other course(s) in this department or field?
51. Before taking this course, did you take any course(s) that gave "transparent" or explicit attention to how coursework and course activities benefit your learning?
    a. Response options: Yes,

b. No,

c. I don't know

52. What is your primary reason for taking this course?

a. Response options: To fulfill a requirement or prerequisite,

b. Interest in the subject,

c. Another reason

53. Are you a person of Hispanic, Latino, or Spanish origin?

a. No, not of Hispanic, Latino, or Spanish origin

b. Yes, Mexican, Mexican American, Chicano/a

c. Yes, Puerto Rican

d. Yes, Cuban

e. Yes, another Hispanic, Latino, or Spanish origin -- *for example: Argentinean ,Colombian, Dominican, Nicaraguan, Salvadoran, Spaniard, and so on…* Please indicate:

54. With which of the following racial/ethnic groups (from the US Census categories below) do you identify? Please select all that apply.

a. White

b. Black, or African American

c. American Indian or Alaska Native Please enter the name of your enrolled or principal tribe:

d. Asian Indian

e. Chinese

f. Filipino

g. Other Asian -- *for example, Hmong, Laotian, Thai, Pakistani, Cambodian, and so on Please indicate:*

h. Japanese

i. Korean

j. Vietnamese

k. Native Hawaiian

l. Guamanian or Chamorro

m. Samoan

n. Other Pacific Islander -- for example, Fijian, Tongan, and so on Please indicate:

o. Middle Eastern / North African (MENA)

p. Some other race. Please indicate:

55. Are you a citizen of the country in which this course is taught?
    a. Response options: Yes, No, I prefer not to respond
56. Which of the following types of schools have you attended other than the one you are attending now?
    a. Vocational, technical or trade school
    b. Community college, junior college or two-year college
    c. University or college other than this one
    d. None
    e. Other
57. Please select a category below that most closely matches your proposed major field of study.
    a. Humanities
    b. Social and Behavioral Sciences
    c. Physical Sciences, Mathematics and Engineering
    d. Life Sciences
58. Are you a first-generation student (first in your family to attend):
    a. College
    b. Graduate school
    c. I'm not a first generation student
59. Are you a first-generation immigrant in the country where you are living?
60. Are you a part-time student? Response options: Yes, No, Other
61. Please identify the number of people in your household/family.
62. Please choose the range that best represents your household/family's income.

- 0-$17,500
- $17,501-$23,600
- $23,601-$29,700
- $29,701-$35,800
- $35,801-$41,800
- $41,801-$47,900
- $47,901-$54,000
- $54,001-$60,100
- $60,101-$66,200
- $66,201-$75,000
- Above $75,000

APPENDIX C

INFORMED CONSENT FORM

This form was taken from the IRB application of Mary-Ann Winkelmes, dated February 2019 that outlines this informed consent document and the subsequent survey questions (refer to Appendix A) have been used since 2015 in a study. The format here has been adjusted for readability.

INFORMED CONSENT
Transparency in Learning and Teaching in Higher Education (TILTHigherEd)

You are invited to participate in a research study being conducted by Mary-Ann Winkelmes, Ph.D., Executive Director of the Center for Teaching and Learning at Brandeis University.

Please read this form carefully. We encourage you to ask questions if you want more information about any part of the form or the study.

If you decide to participate in this study you will be asked to sign this form electronically. A copy of the signed form will be given to you to keep for your records – it has important information, including whom to contact if you have questions in the future.

What is this study about?
We are conducting this study because we are trying to learn more about how higher education students understand their own learning processes, and how instructors can enhance that understanding and improve students' success equitably. Your participation will help instructors and institutions improve students' learning experiences.

Why have we asked you to participate?
We are asking you to take part in this study because you are between the ages of 18 and 100 and are enrolled in a course in college or university.

What will you be asked to do if you participate?
If you decide to participate in this study, you will be asked to complete an online questionnaire at the beginning and end of the course about your learning experiences.

The questionnaire will take you about 2-3 minutes at the beginning of the course and 9-11 minutes at the end of the course.

Are there any possible risks to you?

You may feel uncomfortable answering some of the questions. If a certain question or topic makes you feel uncomfortable, you are free to skip the question. You can also withdraw from the study completely at any time.

There is always the risk that your information could be accidentally disclosed to people not connected with this study; however, we will do our utmost to secure your information so this does not happen.

Will you benefit from participating in the study? You may benefit from this project by becoming more aware of your own learning practices and how these impact your performance in school. You will be providing valuable information about your learning that will help schools and instructors to improve students' learning experiences.

Will it cost you anything to participate in the study?
The only cost to you will be your time.

Will you be compensated or receive anything for participating in the study?
No.

How will your information be kept private?
Any information that is obtained in connection with this study and that can be identified with you will remain confidential to the extent permitted by law. Your name will be coded using a random combination of letters and numbers (for example b4h86) . The list that connects your name with your code number will be kept separate from the actual data we collect.

The list with your name on it will be stored in a locked file cabinet in the researcher's office. The coded data we collect will be stored electronically in a password protected encrypted file on secure computer server space. The researchers will be the only ones who have access to your information.

When the data from the questionnaire is reported (in publications and presentations), it will be in aggregate form – your information will not be separable from the findings as a whole.

What if you don't want to participate or change your mind partway through?
Participating in this study is completely voluntary. You have the right to refuse to participate in all or a part of this study. Even if you decide to participate now, you may change your mind and withdraw from the study at any time without penalty. You may also refuse to answer specific questions at any time without penalty – simply skip them on the questionnaire.

What will happen with your information once research is complete? The information collected as part of this study will be destroyed ten years after the study concludes and the results have been published. Your information (identifiable or de-identified) will not be used or distributed for future research.

Who can you call if you have more questions? If you have any questions about the research being conducted or your participation in the study, feel free to contact the researchers at 781-736-4795 or wink@brandeis.edu.

If you have any questions about your rights as a subject in this study, would like to speak with someone other than the researchers about concerns you have about the study, or in the event the researchers cannot be reached, please contact the Brandeis University Human Research Protection Program at 781-736-8133 or irb@brandeis.edu.

Subject Consent

I have read the contents of this consent form, have been encouraged to ask questions, and have received satisfactory answers to my questions. I understand that my participation is voluntary and that I may withdraw my participation at any time without penalty. I voluntarily agree to participate in this study.

VITA

Taylor Victoria Locks
tvlocks@wm.edu

EDUCATION

- William & Mary: Ph.D. in Educational Policy, Planning, and Leadership (Aug. 2023)
- Florida State University: M.S. in Higher Education Administration (April 2016)
- University of Virginia: B.A. in Classics (Latin) & Foreign Affairs (May 2014)

TEACHING EXPERIENCE

- EPPL 525: Assessment & Evaluation of Student Learning (Spring 2022)
- SDS 3340: Introduction to Career Development (Spring 2015, Spring 2016)
- SDS 5040: Student Personnel Work in Higher Ed. (Fall 2015)

AWARDS AND RECOGNITION

- Evelyn Wallington Advisor of the Year, SAACURH (January 2021)
- W. Samuel Sadler New Professional Award, W&M Student Affairs (January 2020)
- National Advisor of the Year, Pi Lambda Phi Fraternity (August 2018)

PROFESSIONAL WORK EXPERIENCE

- Associate Director for Operations, William & Mary (Oct. 2021- present)
- Assistant Director for Residence Life, William & Mary (January 2019 – October 2021)
- Area Director, William & Mary (June 2017 – January 2019)
- Hall Director, Christopher Newport University (May 2016 – June 2017)

SELECTED PUBLICATIONS & PRESENTATIONS

Locks, T. (2022, Nov). *Assessing student learning: How do we know what they know*. Presentation at the Virginia Student Services Conference, Wintergreen, VA.

Cox, B. E., Thompson, K., Anderson, A., Mintz, A., **Locks, T**., Morgan, L., ... & Wolz, A. (2017). College experiences for students with autism spectrum disorder: Personal identity, public disclosure, and institutional support. *Journal of College Student Development, 58*(1), 71-87.

Locks, T., Mintz, A., & Cox B. (2016, March). *Autism in higher education: Barriers and bridges in a changing landscape.* Presentation at the 2016 NASPA Annual Conference, Indianapolis, IN.

PROFESSIONAL SERVICE

- Staff Representative to the Board of Visitors, William & Mary (July 2023 – Present)
- Professional and Professional Faculty Assembly (June 2018 – Present)