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A Foundation for Transformative Learning Practices in Higher Education

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by

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Abstract

Higher education institutions in the United States have an ongoing rhetoric of claiming that they offer students educational experiences that build skills and prepare them for a career. However, reports from employers and students indicate that many schools are struggling to do so, and research imperative skills like critical thinking have wide construct definitions that can be difficult for institutions to work with. Transformative learning theory (TLT) is a theoretical practice and pedagogy that could support institutions by providing both a pedagogical foundation of what should occur in a classroom and a series of steps for what transformative learning looks like. The purpose of this mixed-methods meta-analysis of forty-four doctoral dissertations and master's theses was to review a collection of TLT observations and interventions that maintained the strong construct consistency of the TLT domain to determine what academic outcomes, characteristics, scopes, and commonalities existed in successful TLT interventions. This could then be used to create a template or lesson plan for institutions. Studies showed that interventions had consistently positive outcomes, although results found were mostly non-significant due to a lack of quantitative and experimental data in the discipline. Instead, the gaps found in the data presented by studies during the meta-analysis are used to determine quantitative gaps in the literature and identify what later studies can do to promote TLT as a worthwhile pedagogical practice for higher education institutions.

Keywords: *transformative learning theory, higher education, college, critical reflection, academic achievement, critical thinking*

Acknowledgements & Dedications

In completing a meta-analysis of other student manuscripts, I had the opportunity to read a lot of other dedication/acknowledgement sections. Dozens of other intellectual peers writing pages of praise and gratitude. I read about how it ‘‘takes a village," the graces of God that blessed their life, about the people who loved and supported them for years, who sacrificed and accommodated so that the author could succeed. Family that was their full foundation. Colleagues and faculty and cohorts who had been with them for years, inspiring insight and reflective analysis. A community or university that nurtured a sense of learning, success, and zeal.

And I can admit that I, too, had some of these experiences. Obviously, I wouldn't have been able to get this far without a golden needle of a committee - Bob, David, and Kim - seeing me through to the end; I recall old seminar-style meetings of ACRIDAT that had some wonderful intellectual conversation; I met dozens of students who both accepted and pushed against my passion for teaching into the viable career that I want it to be. Over the years, I found support from The Worry Tree, Zemspira, a fellow Strange Loop, EMmediate Approval, Horse, Hamburger, the Gentleman, Peck, the dykes in the academy, Origami, and Phones - the people that allowed me to persist and come out on the other side. Beyond these, there were also the calm, placid interactions with a few peers.

But when I think back to the main years of my doctoral study, these aren't the things that I think about. I don't read the acknowledgements of fellow doctors with a mirror of great contentment. Instead, I feel hollow and ill. These words felt so far removed from my own experience that I feel compelled to write this short note with brutal honesty. So to those who actually supported me, I apologize. Let me use these three pages to cater to the kind of reader I had been, to all of the other squares being sanded down to fit into circle holes.

I don't look back on the experiences of my academic journey as full of glowing

and grateful things that others sing about, as they've been buried by the more haunting and disgusting ones that come to the forefront of my mind first. I think about threatening letter telling me "there are a handful of us who would be more than happy to help with a permanent arrangement" to me departing. An envelope full of bloody tampons that was mailed to my home, addressed by the "Researchers Against Invasion." Institutionally praised professional educators who told me I was "too retarded to be a doctoral student." Peers who said my desire to teach was a waste of time. Policies that said I was a burden unless I got grant funding that was counterproductive to my pedagogy. Guest speakers paid for by my institution who talked down to "fucking faggots" like me. Staff who said me wearing dresses and skirts made them "uncomfortable." The advisor who said my prior education was worthless.

Many of these events were so direct that I caution against naming the people who *did* support and help me, under concern that they would get the remnants of guff after my departure.

The worst part is that I *know* that others have had worse experiences than me - faced more hardship, survived direct assault, had nothing for a support system. My evidence is that I made it to the end, comparative to those more skilled than I but in harsher situations who could not. I consider it impossible that I had the worst tier of experiences, which is horrifying.

I'll stop myself there.

At the moment of this edit, the time of submission, I look back on the the core five years of my program with wistful regret. Glimmers of relief are fighting against systemic attacks to my very existence, and just because I survived doesn't make the years any less difficult. While I'm relieved that it's over and have already taken many refreshing steps out of this hole, the trials during it leave me bitter. I don't regret my choices per se, nor this study and analysis, but I think my experience is

a far cry from what it could have been under other, better circumstances. It is not reflective of what I wanted my career or writing to be, but rather, a reflection of what it needed to be for me to move on.

It was supposed to be difficult, yes; some combination of an intellectual gateway for proof of competence chained by systemic flaws that aren't the fault of any individual. But I speak as a person who averaged 70 hours of work a week for around 9 years, and - I enjoyed the hours teaching, making syllabi, meeting with students, and reading articles on topics I was fascinated by. The hardship involved in this path did not come from the ‘‘work,” nor the reading, nor the writing, nor the exams, content, schedule, or hours spent. I might think differently as I get older and the repercussions of that lifestyle catch up with me, but for now I'll stand on principles.

I began my doctorate career with a dedicated passion to be a lifelong learner and bridge the gap between theory and practice. Being a teacher and educator in as many forms as I realistically could. While I don't think that's disappeared entirely and I'm slowly regaining that elsewhere, many encounters since becoming a doctoral student tried their hardest to wring it out of me at most opportunities. This manuscript is in many ways the result. Not necessarily for better or worse. It just is.

So here's my final dedication:

If ‘‘it takes a village” to raise an individual to success (complete a doctorate), then this is dedicated to all of the villagers who were outcast and stoned.

If it is faith in God and the higher powers that get one here, this is dedicated to the heathens who were shunned before they had a word.

If you, like me, felt hollow while reading the words of love and acceptance for others who had success while cognitively knowing there had to be others suffering like you, this is my acknowledgement of your struggle.

This is for you, with the promise that my career is dedicated to making the path even a modicum less treacherous for those who follow me.

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Chapter 1

Introduction

1.1 Higher Education's Continuing Conundrum

The past few decades of education literature have reflected an increasing number of criticisms and quandaries about the purpose and implementation of higher education. Compilation reports like *Learning Reconsidered* (Keeling, 2004) or *Employability of Graduates and Higher Education Management Systems* (Wigley et al., 2012) have been assembling complaints and explaining the ways in which they manifest for decades; many of these originated from outside of and directed toward undergraduate programs. Employers, communities, and graduates themselves have been bewailing that the average graduate doesn't actually have the skills they need to succeed in a career (Wigley et al., 2012; Taylor, 2006). There was (and still is) an expectation that higher education practices should prepare students for careers and for employment in a workforce - something that critics believe, at least pragmatically, wasn't (and isn't) being met, with students instead knowing a great deal of information from the content-based institutions but lacking many of the skills desired by employers.

In response, many institutions began implementing policies, educational approaches, and mindsets around higher education offering something ‘‘more," and embracing student policies and educational practices that would (ideally) encourage student growth around what was being asked of higher education. Higher education as a whole started moving away from the idea of knowledge and education as a vast amount of content and instead a set of skills that are equal parts pragmatic and

complex[1] (e.g., Barrie, 2004; Hammer & Green, 2011; Davies & Barnett, 2015). Many roots of these changes can be seen in the public relations and mantras of higher education institutions, using slogans like "think big" (University of Rhode Island), offering students "worlds within reach" (University at Albany, SUNY) or proclaiming that they are "educating for the real world" (University of Bridgeport).

Despite these claims, however, research evidence has suggested that attempts to grow in the ways advocated by Keeling (2004), Wigley et al. (2012), and others have been unsuccessful. Studies into student success with "highbrow" skills like critical thinking have been faced with holistic assessments which suggest that institutions aren't sufficiently developing effective practices for their students (e.g., Van Damme & Zahner, 2022). This isn't to say that successful changes haven't been made or that institutional policies haven't improved; rather, whatever approaches are currently being used are inconsistent or difficult to translate between institutions.

1.1.1 Spotlight for a Solution: Transformative Learning

Across this breadth of inconsistent efforts and results, there is a particular framework and intervention that has been receiving increased notoriety and popularity for working in higher education, but has yet to reach the status of many other institutional changes. It is an approach not only to classroom education, but a holistic view of the kinds of experiences necessary for a learner to grow in the same way that employers and graduates have been assuming; a perspective that fundamentally requires change in both classrooms and institutional policies. This is transformative learning theory.

Transformative Learning Theory (abbreviated: TLT) has become an increasingly

[1]Many of the broader societal, economic, and cultural issues with the higher education system in the United States have been and are being addressed by more qualified parties; see examples like Goldrick-Rab's *Paying the Price* or Vedder's *Restoring the Promise* for details. This manuscript focuses on the teaching practices and outcomes at a higher education setting, not the systemic problems with higher education as a whole.

popular tutelage in higher education with about the same timeline as the criticisms of higher education (Ellis, 2021). Although the development of TLT began with adult education (Mezirow & Marsick, 1978b), the application of transformative learning in higher education institutions gained notoriety in 2004 with the publication of *Learning Reconsidered*, as the editor for that report, Keeling, was (and is) a major author in the transformative learning field. Although the advantages of TLT to higher education were not strictly new perspectives at the time, it was one of the first widely accepted acknowledgements from national organizations of education - the American College Personnel Association and the National Association of Student Personnel Administrators - that suggested how a student's experience was directly related to learning and development that would be essential for lifelong skills.

This is an exploration of how TLT could grow as a sort of dark horse solution to higher education's conundrum.

1.2 Why Transformative Learning Theory? A Synopsis

Largely attributed to Jack Mezirow (1978b), transformative learning theory suggests that the learning experience is, in the fullest sense, one of constant self-reflection and evaluation. By definition, a transformative learning experience is not just one where a person learns additional information, but one where their assumptions about connections between ideas and how the world functions change. It shares many similarities (and roots; see Mezirow & Marsick, 1978b) with deep learning in that it concerns values that result from the application of knowledge, not just knowledge for the sake of it. In TLT, a person engaging in learning is constantly being exposed to new situations and considering whether their current understanding or beliefs adequately explains the observation.

In modern uses, Transformative Learning Theory is known for presenting a stepwise process of how a person holds, engages with, and changes their ideas about their assumptions and interpretation of the world's functions. TLT generally holds to a list of a few consistent principles, described here (a more detailed list of steps and some of their alternatives will be provided in Chapter 2).

At the outset, it is assumed that a person's understanding of the world is in some sort of homeostasis where they have developed a set of ‘‘frames of reference" about how cultural, social, educational, economic, political, or psychological processes should function. While these frames may carry nuanced perspectives for individual topics without disturbing the overall frame, there is a sense of stability where a person's frames are shaped by how they have observed the world to work. They believe what they do because social norms, personal experiences, and logic have guided them to believe so.

The transformative experience begins when a person encounters a situation, person, or example that conflicts with this frame. The homeostasis is disrupted because an incongruous experience provides a new perspective or example that isn't easily accounted for in the current standard. If a person acknowledges this disruption, they can then consider the reasons for why their new experience does not match with their previous notions. For example, they might explore whether their new experience is a special exception that does not impact their frame and accommodate their existing ideas, or they may consider that their previous assumptions were incorrect because they had not incorporated information from these new experiences. Whatever the case, a person then explores how they can change their own habits, actions, and practices.

Transformation Corner: Kaneisyeon's Teaching

It is common, in many ways encouraged, for higher education instructors to build a skillset around a particular set of teaching practices or pedagogy. This is where you find your purists of cognitivism, instructivism, project-based learning, and so on, who derive teaching practices from the idea that these are the most efficient ways to instruct or are the most congruent with their own beliefs around the purpose of teaching.

For this example, consider a fictional Professor Kaneisyeon who often teaches introductory STEM courses of calculus, linear algebra, and physics. Following training she was given on teaching, her methods follow the main tenets of cognitivism. She provides textbook readings and lecture slides for the intricate topics students likely aren't familiar with, but for topics that she deems approachable based on observations, she scaffolds experiences. She creates physical demonstrations and then asks for discussion on what might be happening; draws visualizations for what formulas display, and presents assignments that ask students to justify solutions with evidence. These processes work for a majority of students who are successful.

In a following semester, she is offered to teach vector calculus as her first non-introductory course. While she plans to use the same teaching style, the first exam makes it clear that something isn't working – over half the class failed, and students' attempts at answers weren't close to being correct.

From the perspective of transformative learning theory, Kaneisyeon has two categories of options: she could dismiss the issue or seek transformation of her assumption. In the former, she might consider the failing grades as the fault of the students for simply "not getting it" or decree that the issue is happenstance – after all, it's worked every time before! In the later, she might consider what reasons prevent her cognitivist approach from being effective for this context. It worked every other time, so what's *different* about this time?

Should she follow the ideas of transformation, there would be several avenues to explore. For the sake of example, Kaneisyeon sends out a feedback survey to the class on where they are struggling. In responses, a theme appears – although she frequently draws visualizations and asks students to consider why a formula exists a certain way, the students write that the material is so different from anything they've had in another class that they don't know how to start guessing. The few students who are succeeding are those who have had the opportunity to be tutored before, which is a minority.

This gives Kaneisyeon something of an answer for why her cognitivist practices weren't working, and a basis for how to explore options for how to change her teaching practices in the later part of the semester. But even following these first few steps, she's beginning the process of transformation around her assumption of cognitivism as an *always* superior technique to a more nuanced perspective of it being *generally* superior for certain topics, but unhelpful for vector calculus which is more anomalous for students.

1.2.1 A Problematic Gap

Since the rise of TLT as a practice for higher education, transformative learning assessments and interventions have become increasingly known in higher education settings (Ellis, 2021); the most recognizable of these come in the form of classroom interventions for specific subjects, which have suggested how to implement transformative learning principles into disciplines from general science (e.g., Vieira & Tenreiro-Vieira, 2016) to nursing (e.g., Simpson & Courtney, 2002) to language (e.g., El Soufi & See, 2019) to fine arts (e.g., Recka, 2018).

However, there exists a strange gap in trying to pair transformative learning theory - which is largely abstract and philosophical in nature - with interventions that focus on subjects. Specifically, seminal upheavals in theory can have pervasive implications for pedagogical practices that aren't easily packaged into a box-presented module or assignment, and thus not necessarily understood by instructors or faculty (Fried & Associates, 2012).

In the opening section, I referred to transformative learning theory as a ‘‘tutelage," in part because it walks a unique line between pedagogy[2] and implementation. From a philosophical perspective, TLT shares much in common with pedagogies like constructivism and cognitivism; it has baseline assumptions for how learners interact with the world and new information is applied, with its own definition of knowledge and decrees about what is important in an educational environment. Yet it also has some granular details in its process, defining a series of steps and criteria that would be more akin to a focused practice. While this blend of philosophy and practice is arguably one of TLT's strengths, it can cause some dissonance without a middle

[2]Readers familiar with the history of educational psychology as a domain might consider the term ‘‘pedagogy" as a misnomer. Traditionally speaking the word ‘‘pedagogy" refers to education for children and other dependent learners. In the context of adult education, like that of transformative learning, the historically accurate term would be ‘‘andragogy," which has fundamentally different principles regarding how a learner interacts with content (Holmes& Abington-Cooper, 2000). The term pedagogy is used throughout this text simply because it is far more popular in educational research and has in many cases become an umbrella term for both, even in higher education.

ground of general practices that are directly derived from the criteria and principles.

This study is a look at this gap, reviewing some of the broad and abstract principles of transformative learning theory and looking for how they have been manifested in numerous smaller interventions. A meta-look across these implementations could provide some insight into how to coordinate between focused, specific rules from the pedagogy and broader characteristics of interventions.

1.2.1.1 Sidebar 1a: The Distinction between "Transformative Learning Theory" and "Transformative Learning"

An important distinction will run for the rest of this text: in the literature on transformative learning theory, the concept of TLT is referred to in several ways that can be easy to obfuscate. While I will do my best to prevent confusion among them, there will likely be times when these distinctions may become unclear when referring to others' work.

The legacy of transformation and deep learning associated with Mezirow (Mezirow & Marsick, 1978b) - the philosophy of how people interact with information and develop as a result - is referred to as "transformative learning theory." As is appropriate for a pedagogy, it presents a series of assumptions about the learning process and in what circumstances it applies. However, many later publications - from both Mezirow himself and legacy authors - sometimes refer to a concept called "transformative learning," which seems to describe the experience a person has when they are learning in a transformative way.

Moreover, other similar terms have been used in the literature, such as "transformative learning outcomes," or "transformative learning process" (see Wilkerson, 2019, for examples).

The exact distinctions between these terms are at best unclear. It's possible that these terms may refer to different concepts; but with the prevalence of modern

publications referring to the concept of "transformative learning" without referring to it as a theory, it's also possible that these terms are abbreviations of each other and largely overlap in their meaning.

For the sake of consistency, I will be using these terms as distinct from one another whenever possible, using the most generous definitions that keep the terms related to the transformative learning theory literature while still giving them distinct purpose to be used in writing. To the best of my ability, the terms will be used as such from this point onward:

- *Transformative learning theory*, or TLT, refers to the philosophical and pedagogical ideas of the transformative learning domain. This includes ideas of how learning is a change in one's frame of reference (see Section 2.2) or the criteria for defining when learning is transformative.

- *Transformative learning*, or TL, refers to the learning process that we assume a person goes through when experiencing the transformation described in TLT. This process is described in detail in Section 2.2.

- *Transformative learning outcomes* refers to educational or measurable results of transformative learning process, described above. This can include some general education outcomes (success in a course, GPA, etc.) or development in skills used in the transformative learning processes, such as dialogue.

1.2.2 Using TLT in Higher Education

Utilizing TLT in higher education settings is not new; to the contrary, Mezirow's original exploration that would later develop into transformative learning theory was centered around adults who were re-entering education (Mezirow & Marsick, 1978b). More specifically, the initial study (described in Section 2.1) considered how certain higher education programs needed to change when they started serving the working-

class instead of middle-class; traditional academic practices were less effective, and thus, evaluations of existing programs found that more transformative approaches yielded better results.

This introduced the idea of transformative learning practices improving students' performance in traditional academic components, which persisted for decades (Cranton, 2002/2006), and a subset of transformative learning literature retains this trend of focusing on adult education. Moreover, there are some programs and schools that seem to have predominantly taken it on as a modality of practice, with one of the most notable being the University of Central Oklahoma (Ellis, 2021). Although these practices are compartmentalized to specific schools and programs, it suggests that the kind of learning TLT promotes is desirable to higher education.

Similar to how the claims about critical thinking spread about higher education, Mezirow's conception of deep and transformative learning suggests something of how adults learn by challenging their own assumptions and the nature of what it means to learn. ‘‘Learning" is a process of being able to see things beyond their face value and being flexible with exposure to new experiences. This contrasts with the conception of schooling and learning we see for younger children (and, in many cases, adults), which is often about acquiring information and ‘‘catching up" to existing domain knowledge. Although acquired and learned information is in many ways helpful to the transformative process by providing grist for the mill, exposure to new ideas isn't enough to promote a change in social behavior or engagement.

The desire to move from this ‘‘knowledge acquisition" mentality toward a perspective of challenging ideas makes sense in a higher education context, where it's realistic if not probable that a learner will reach a point in their profession where there aren't any more concrete facts to memorize. Instead, professional skill relies on one's ability to find, consider, adapt to, and act on revolving doors or new experiences and information. A focus only on growth or acquiring new information

is insufficient preparation for this revolving door, which is in many ways the same issue that was being presented of higher education by employers - that graduates may know a great deal about the field but struggle with pragmatic applications or new discoveries (Taylor, 2006). Being a professional or academic is, in many ways, about building a skillset that can work with ever-changing ideas rather than simply accumulating more knowledge. Hence, desires for ‘‘critical thinking” make sense in this context as the desired outcome from this kind of education.

Moreover, literature from the past few decades has provided evidence that transformative experiences can be scaffolded (Chien, 2018). Although it can be difficult to do so due to conflict between traditional, curriculum-driven assessment and the kind of informal learning TL can promote (Livingstone, 2007), transformative learning processes can be built and presented in the same way many other educational practices can.

Unlike other similar domains that have been utilized in higher education - critical thinking being the most relevant - TLT literature has the benefit of coming from a domain that spends most of its time understanding its own process. While it's reasonable, and in many ways ideal, to want critical thinking outcomes in professional education, the current findings suggest that creating a framework around fostering critical thinking as a practice has been difficult (Behar-Horesteing & Niu 2011). Said another way: part of the issue with critical thinking literature is that it is trying a variety of methods to obtain a singular outcome that itself is an unclear and moving target. In contrast, TLT makes few to no suppositions on what ‘‘transformed behavior” looks like, since transformation isn't an outcome measure. Yet, at the same time, transformative practices inherently require, and thus develop, critical thinking skills, by nature of the processes required.

This makes TLT a prime candidate for higher education practices and interventions for two reasons. Firstly, it means that studies utilizing transformative learning

practices can adapt to outcome measures dependent on the context and desire, including using outcome measures specifically sought after, such as grade performance. Secondly, the stepwise process that the theory has developed (described in Section 2.2) already provides a template for educators and schools to use in promoting this kind of learning at a variety of skill levels and in a variety of definitions.

This potential has already been acknowledged in subject-specific interventions and modules that use transformative learning practices as a basis for pedagogy (see Section 1.2.1 for a sample list), especially since there was a call for quantitative support for transformative learning theory (Brock, 2015). However, the emphasis on measurable and subject-specific interventions results in a sort of conflict gap in the literature. Historically, the largely philosophical and epistemological root of transformative learning theory has led to a domain of literature which has lacked a strong foundation of generalizable quantitative ideas (Walker, 2018; Brock 2015; Glisczinski, 2008). Instead, a majority of the literature has focused on broad strokes of understanding how the process of transformation works, either from a purely theoretical context of the general transformation pattern or how this pattern might manifest in a specific system. In the more recent investigations that move toward practical application in higher education, the scope of interventions have been much smaller, concerning only single classrooms or courses rather than a department, program, or institution.

1.2.2.1 Sidebar 1b: The Scopes of Transformative Learning Theory and Critical Thinking

Throughout this exploration, I have and will be making frequent reference to the idea of ‘‘critical thinking,” and it is important to state why I decided to focus this investigation transformative learning theory instead. The inciting argument of this investigation was about the goals and purpose of higher education - why focus

the investigation around transformative learning theory as opposed critical thinking, which is more closely related to the goals and outcomes that higher education seeks (Ellis, 2021)?

The answer is one of scope and definition. As stated throughout this section, TLT most closely resembles a pedagogy, a tutelage, a framework. It has principles, steps, and assumptions about human learning that can suggest how an educational system considers scaffolding student development. It is a process, and if the gap presented by this study could be filled, a practice. The domain of TLT frames critical thinking to have a larger scope that doesn't fit under the idea of instructional practices.

In educational literature at large, critical thinking doesn't have a definition that is consistently agreed upon by scholars, and has had over a dozen iterations in the past few decades (Sternberg & Halpern, 2020; see Behar-Horesteing & Niu, 2011 for prominent definitions made before 2010). The common factors between definitions suggest that critical thinking is a set of skills, awareness, and perspective for understanding a context or task in a deep and meaningful way. Critical thinking includes both the cognitive skills to reach this understanding - rational thinking, analytic reasoning, problem solving, and the like - and sufficient engagement in the task to properly use the skills (Sternberg & Halpern, 2020).

Although the definitions of critical thinking are inconsistent, its accepted status as a set of skills or approach to task completion is enough to establish its placement as an outcome that can be learned and assessed. When critical thinking is used in the institutional policies and goals of higher education, it is a desirable outcome that describes some kind of cognitive ability that is adaptive, flexible, receptive to new information, and able to evaluate (e.g., Hammer & Green, 2011; Davies & Barnett, 2015). Critical thinking is an *outcome*, a skill that we desire graduates of higher education to demonstrate.

TLT maintains this perspective by describing critical thinking and its related

skills as outcomes that may result from transformative processes, but not the educational principles and practices themselves. Critical thinking is in a sense larger than and beyond the scope of TLT, as it might be achieved by any number of practices. TLT is being presented as one promising avenue to achieve it and the goals of higher education, but critical thinking is not limited by the scope of the principles of transformation.

So, to answer the question as to why this exploration focuses on transformative learning theory: it is because TLT is more closely defined and designed around creating educational techniques. Critical reflection, the most widely regarded component of TLT, is an isolated skill that promotes a broad set of skills similar to critical thinking, but with a more rigorous definition.

1.2.3 Statement of the Problem

Current literature on TLT mostly exists in these two extremes, which leaves the literature either to exist in the abstract or in hyperfocused interventions that would struggle to be used in other contexts. There are both abstract and pragmatic approaches to TLT, but they are either too large or too small to be presented as a framework for most higher education institutions. Thus, the main issue I aim to address in this study is negotiating this conflict between the desire for transformative learning to serve as a framework for institution-level higher education practices while primarily existing as smaller interventions for classrooms and lessons. Specifically, 1) do the current implementation of TLT practices actually lend themselves well to the idea of being generalized as a higher education framework, and 2) if such could succeed, what do the existing interventions offer us for such a framework?

Currently, many higher education institutions are pushing a narrative of their education being about more than facts; in part because of requests from outside sources, and in part to persuade students that their school is a magnificent product.

They claim to expand the worlds and minds of students to be independent and critical thinkers. However, the existing literature in transformative learning theory sits mostly at the edges of two cliffs: the epistemological side where transformative learning theory explores the way humans shape the way they interact with the world, and the granular examples of how a specific course in a specific setting can be set up to be transformative. In the exceptions that do exist and attempt to bridge this gap, like the University of Central Oklahoma (Ellis, 2021), these resources are not readily accessible to other institutions, which leaves the cliffs a leading issue for developing TLT practices. The first side is quite broad and would require substantial deductive testing to form into a practice, and the second would require inductive generalization from evidence.

1.3 The Goal of this Investigation

I propose that a meta-analytic look at some of the smaller implementations of transformative learning theory can serve as a bridge to provide a more general framework for transformative learning practices in higher education. Specifically, by comparing existing interventions and seeing which principles, components, and criteria of transformative learning are regularly used and successful, we can identify philosophical qualities from which to deduce practices.

The current array of studies utilizing TLT in higher education contexts, while small compared to its theoretical literature, gives support to the idea that generalized modules or interventions could be made once this gap is filled. The empirical support that does exist can be used to find patterns in what practices have been successful. So rather than create an intervention or modality for a specific setting - as has already been done for some - the goal is to take these pockets of quantitative evidence and amalgamate them into a foundation of support for future development. Rather than

seeing transformative learning theory as a lens that can alter specific goals of boosting critical thinking in a class or being a viable teaching approach for a specific program, it can be advanced as a general framework with consistent and measurable benefits - the same consistent and measurable benefits, mind you, that modern institutions are still using to evaluate their students.

1.3.1 Guiding & Research Questions

In part because the goal of this investigation is to form a general foundation for practice, my guiding and research questions are less about direct conclusions to specific hypotheses and moreso musings and guided ideas that can have open-ended answers. A lot of the preemptive hypothesis work around the possible influence of transformative learning theory has already been done, and to be too specific with my hypotheses would defeat the point of discovering the key characteristics of a foundation.

That said, to provide structure for this investigation, I summarize the guiding questions of this study as:

1. What specific student outcome measures has transformative learning theory been successful at promoting success in higher education?

2. What characteristics, criteria, or elements of transformative learning theory are emphasized or utilized in these successful practices?

3. What are the characteristics, themes, and commonalities between the most successful transformative learning interventions or practices?

4. How would we form a template module or intervention for these successful practices that could be used across institutions or disciplines?

1.3.2 Methodological Overview

This is a mixed-methods meta-analysis based on the practices used in educational and psychological sciences (Boyle, Connolly, & MacKay, 2016; Hattie, Rogers, & Swaminathan, 2013; Sánchez-Meca & Marín-Martínez, 2010). It includes 44 master's theses, and doctoral dissertations that were founded in transformative learning theory. A full explanation for why these were selected for study is included in Section 3.1.2, but to summarize, they offered the best compromise between detailed explanations of the transformative practices that could be distinguished for meta-analysis while also providing studies directly relevant to higher education practices.

Since the conceptual goal is for transformative learning theory to guide higher education practices, studies were included if they were founded in transformative learning theory but had an outcome measure similar to those used in a postsecondary setting, such as course learning objectives, GPA, or graduation. The foundation of the investigation is a quantitative meta-analysis of the characteristics and interventions used in the studies and their effective outcomes on academic practices; the qualitative evaluation is built upon these results by identifying the characteristics with the most generalizable impacts that could be used to create a framework for many higher education institutions.

Studies were coded (Section 3.2.1) for any information that could determine aspects of transformative learning theory and characteristics of higher education in which they are applicable. Examples of coded items include the characteristics of transformative learning used, institution type, intervention type, learning outcome measured, and the impact or effect of transformative practices.

Chapter 2

A Review of Transformative Learning Theory Literature

2.1 What Transformative Learning Means

The disciplinary root of transformative learning theory is attributed to Mezirow and Marsick's ‘‘Education for Perspective Transformation: Women's Re-entry Programs in Community Colleges" (1978b). The research study behind this report was not intending to form a new method or pedagogy of teaching. It was much more specific than that: Mezirow was evaluating various educational programs that focused on helping women re-engage in higher education (specifically, community college) after some time without education. Rather than a pedagogical or philosophical investigation indicative of what TLT is sometimes known for, it was one of assessment and evaluation, trying to determine the factors and characteristics of programs had proven the most beneficial to helping the women succeed in their education[1]. Findings could then be used to bolster and improve existing programs.

The prospect for transformative learning to serve as a solution in higher educa-

[1]The similarity between Mezirow and Marsick's investigation and how I decided to structure my own - by assessing the quality and success of existing programs instead of starting with broad principles of learning - was an active decision on my part. While there isn't any symbolic or thematic purpose of saying that this study attempts to emulate Mezirow and Marsick's main goal, I do suggest that the fundamental goal of providing structure to a loose domain is shared between the two.

tion (Ellis, 2021) emerged from how rapidly such re-entry programs had been growing in the past decade (Mezirow & Marisck, 1978b). Although some long-standing programs developed from women's rights movements did exist, other programs connected through colleges and universities, funded by the Higher Education Act, and/or focused on mimicking existing education practices were becoming more popular. However, these programs took cues from existing programs that were often designed for upper-middle class women, not the working class who were increasingly interested in such programs.

An evaluation of over three-hundred programs with direct interviews from students gave a clear message. Programs that most directly emulated the content-focused, instructionsist, and banking models, where students are seen as recievers of knowledge bestowed to them by authorities, struggled with higher dropouts, lower student satisfaction, and overall less success. In contrast, programs that were built to be supportive, empower their students with autonomy, and recognize the psychocultural lives the students came from were successful. Mezirow and Marsick made particular mention that many of the women in the programs had been subject to a demoralizing narrative of having their lives defined by gendered roles of their worth in society, a position that both impeded their psychological ability to engage in the programs and made true evaluation of their own identities and transformations difficult.

Transformative Learning Theory was formed out of trying to understand the balance of characteristics the successful programs had. Successful designs had to recognize the disorienting experiences of their students and their difficulty with self-examining their own identities, but also could not ignore that the societal assumptions about their worth were part of the reason for struggling in education. Thus, many of the core principles and criteria of TLT emerged not just for their impact on the women's re-entry programs, but educational practices in general.

2.1.1 Core Criteria of Transformative Learning Theory

Mezirow initially proposed three criteria for transformation in 1990 and included them in the revised Transformative Learning model in 2000; these criteria, accompanied by a more detailed explanation of the process of transformation, were meant to describe a kind of educational environment that balanced the need to recognize the students' psycho-social identities while providing space to create autonomy in their own academic engagement. The three criteria presented were *critical reflection*, *individual experience*, and *dialogue*. At the time, a majority of transformative learning theory focused on critical reflection, as it more specifically refers to how one responds to conflicts with their frame(s) of reference, while the other two refer more to the way in which the experiences happen.

In 2009, Mezirow suggested three additional criteria that more closely addressed transformative learning's roots as an educational concept: *holistic orientation*, *awareness of context*, and *authentic relationships*. Although these criteria are not exclusive to educational environments, they more closely tie to TLT's roots in adult learning. Authentic relationships, for example, discusses how a learning environment needs (and in many ways thrives on) a level of social equity.

The exact status of these criteria is debated in the current TLT domain (e.g., Romano, 2018). While it seems that a vast majority of the literature agrees on them being meaningful to transformation, discourse exists around whether to adhere to only the first three or include all six, which one(s) is/are the most important for transformation, which should be classified as criteria versus acknowledged as environmental characteristics, and so on. For the purposes of this discussion, all six criteria are included both theoretically in this review and methodologically in the study.

2.1.1.1 Original Criterion: Critical Reflection

Although the term ‘‘critical reflection” has been used to broadly describe logic and problem-solving processes, it holds a more specific meaning in TL literature. *Critical reflection* is framed as the ability to question, critique, and reframe presuppositions that influence an individual's thoughts and actions.

The TL domain posits that in our day-to-day life, our beliefs and presuppositions serve as a basis for our actions and decision-making. Whenever we are faced with a social stimulus, these go-to perspectives prompt us to act in typical ways that are congruent with our desires; this is called ‘‘habitual action,” or ‘‘non-reflective action.” In a TL model, habitual and non-reflective actions aren't strictly improper or bad procedures, because they are the standard practice that we do for the sake of efficiency in making decisions with a moment's notice[2]. The reasoning for claiming that these everyday actions are usually absent of critical thinking is simply due to it being too complex to engage with in such a short amount of time.

Thus, critical reflection is such an important part of TL because it is a process that can be done after an event or action, a form of *ex post facto* reflection; it is not limited to being a process that must be done at the moment of a given incident. Through critical reflection, a person looks at their presuppositions, considers how these are being conflicted with the current dilemma, recognizes the impact these assumptions have on their own actions, and transforms these baseline presuppositions. Actions themselves are not directly controlled or changed by critical thinking; rather, actions are something that a person observes in reflection, but does not actively try to change. Changes to action are a subsequent result of any changes to presuppositions.

Without critical reflection, a person might engage in the other two components

[2]Those of you with experience in cognitive and neurological processes might consider that this description of a person's habitual actions has strong overlap with the idea of heuristics. While related, it is more apt to think of habitual actions as the connection between one's immediate assumptions and the behaviors those assumptions evoke, rather than being strictly cognitive.

of individual experience and dialogue, but would likely only do so in a habitual way, inhibiting the chance for transformative or meaningful change.

2.1.1.2 Original Criterion: Individual Experiences

A core component of allowing a person to engage in critical reflection is being able to observe their own experiences. For as much attention as critical thinking and reflection get in the TL model, they primarily hold to the assumption that a person's evaluations will be applied to themselves. This is in part because TL focuses more on the *process* of thinking, rather than the *outcome* of it; so although it is technically possible for one individual to be told of another's presuppositions, watch their actions, observe the outcomes, and present the reflective conclusion to them, doing so will inevitably miss the point. The other, arguably greater reason for individual experiences needing to be a core criterion of TLT is that the distorting dilemmas of TL are inherently tied to one's own experience.

It is generally agreed that the transformative learning process usually starts with a distorting dilemma. Something causes a predicament between a person's existing presumptions and what they aim to experience in the world (distorting dilemmas are covered in Section 2.2, along with the other steps of transformative learning). In the TL model, this distortion can't really occur second-hand or third-hand. It can really only occur when a person experiences that dilemma for themselves.

But just because TL focuses on an individual's experience doesn't remove the possibility for constructive education, classrooms, and other conventional learning environments to be transformative. An individual enters any experience, novel or familiar, with their frames of reference, habits of mind, and points of view. They bring their presuppositions about expected outcomes. However, challenging or opposing perspectives to these don't have to appear at random, and I'd argue they seldom do. Rather, knowing what habits of mind and frame of reference a person brings into

a situation can inform or shape what experiences will be made readily available in future experiences.

Transformation Corner: Walter's Pain

In addition to the core criteria for transformative experiences, there's an underlying assumption that separates TLT from many other educational practices: a focus on scaffolding a process without commitment to a specific outcome or "right" kind of transformation. Although the highly social nature of TLT and Mezirow's social justice perspectives of equity might suggest something of an orientation about what transformations should be, the theory itself isn't defined this way.

To demonstrate this point, follow this example about Walter.

Walter has a stark, solidified opinion about physician-assisted dying for people with terminal illness. Rather than being just a private opinion, Walter has given advice to family, friends, and teens at a local youth group based on this stance. Since physician-assisted dying isn't a topic that comes up often in his life, Walter doesn't have any reason to look at or change his opinion. He carries it for decades.

In his early fifties, the topic comes up a few times within the same week. First, one of the other adult leaders of the youth group asks Walter to mitigate his opinion in front of the teens they meet. At a family reunion the following day, his brother announces that he will be looking into physician-assist options in the event recovery from his upcoming surgery is too painful. After the reunion, Walter's son brings up that one of his college courses recently reviewed the history of physician-assisted dying laws and how they vary by state.

Here we have many of the core criteria to start transformation yet: Walter is having social dialogue with other people who not only have different views on the topic from Walter, but different views from each other; the topic is increasingly relevant to his own experiences as related to his volunteering, brother, and son; he has been asked to reflect on his actions and change his behavior around the youth group.

Whether or not Walter will follow the transformation process or not has yet to be seen, but more importantly – this narrative would hold true regardless of what Walter's original opinion actually was. He may have strictly opposed the idea, but thought it might be acceptable when it was closer to home or explained in detail by his son; alternatively, he may have been rashly trusting the practice until it could have affected his brother or his son explained the historical problems.

Both extremes and everywhere in between are covered by TLT, because as stated at the beginning: TLT focuses on the essential components, the scaffolding, the disruption of assumptions, and the possibility of transformation. The exact result and degree of change requires that the individual in question remain autonomous to experience the conflicting perspective, reflect on their presuppositions, and explore their own options. To suffocate the experience by decreeing a "correct" viewpoint directly invalidates authentic transformation.

2.1.1.3 Original Criterion: Dialogue

Throughout the transformative learning model, Mezirow makes it clear that transformation, responsible agency, frames of reference, and distorting dilemmas are inherently social concepts. A person in isolation has little reason to challenge or change any of their frames of reference. Even if we were to assume a situation where an individual could be isolated and walk around to discover the Earth, any new or observed discoveries they might encounter don't really count as ''transformation." This kind of scientific exploration and inquiry around facts and the way the world works are too cognitive; a person is really only sorting their experiences to come up with an eventually ''complete" set of schemas that fully explain anything they might encounter. Transformation is different because the individual is an active agent in deciding how they want to explore, adapt, or evaluate values.

Since TLT assumes that the disorienting dilemma is inherently social in nature - it comes from a conflict with another person's frame(s) of reference - there is an inherent social factor of debating between ideas, encountering the world as other people or the world as constructed by other people. There is the need for *dialogue*, which serves as the medium for TL interactions.

Dialogue in this sense refers to both interpersonal relations and intrapersonal ones. The interpersonal side involves, as said before, the experiences of interacting with differing or novel ideas through other people or the world as made by other people. Since critical thinking and reflection are focused on the relationship between one's presuppositions and the outcomes that result from them, they rely on the interpersonal aspect of other people reacting to the individual. The intrapersonal comes from internal debates that a person has when comparing experiences, deciding between priorities, and reflecting on the connection between their presumptions and outcomes.

2.1.1.4 Revision Criterion: Holistic Orientation

In addition to the academic, information-driven, and factual nature of educational and learning environments, holistic orientation suggests that a transformative experience is boosted by understanding the affective and relational dynamics between people. This is different from saying that one eschews facts and academic standards for emotions and opinions; rather, this is about how affect and interpersonal relationships changes the dynamic with which ideas are exchanged. If one expects learning to be a hierarchal and rational process, that learning will likely struggle to be transformative and instead take the form of banking. For education to promote meaningful change, it can scaffold and provide easy access to new ideas and facts, but should do so in a way that recognizes the influence of why ideas exist and who is using them.

2.1.1.5 Revision Criterion: Awareness of Context

Context in this sense refers to historical and societal aspects of how perspectives come to be, such as environment, bias, conflicting interests, and the like. Awareness of context, like many of the other TL criteria, moves away from the rigidity of observations as "facts," instead prompting one to think about whether a source is reliable in a given debate, whether a perspective would be seen equally among different people, and issues of social access. This is particularly meaningful in the critical reflection parts of TL, as a person acknowledges and understands the "why" behind differing perspectives. This awareness can serve to first make transformation seem approachable by not equating the need to change as being contemptible - perhaps explaining why someone's presuppositions formed the way they did, even if they are no longer serviceable - and to promote Theory of Mind practices on why others may have perspectives that differ for equally suitable reasons.

2.1.1.6 Revision Criterion: Authentic Relationships

Particularly meaningful for academic environments and teacher-student dynamics, ‘‘authentic relationships” refers to the ability for social interactions in a TL space to be transparent, welcoming, and sincere. This differs from dialogue because while the component of dialogue is focused on the necessity of being able to communicate with other people (ideas are exchanged in multiple directions), the inclusion of authentic relationships instead focuses on the nature of those interactions and how easily they occur. Simply put, engaging in transformative experiences is a taxing, and in many ways vulnerable, process. For a person to be readily distorted, engage in discomfort, develop new skills, and try new perspectives, a TL environment benefits from finding ways to minimize stress, anxiety, and falsehood that can lead to an environment feeling socially threatening. Using other educational psychology terms, engaging in transformative experiences already uses a substantial amount of cognitive load (Sweller, 2011); removing social boundaries and tip-toe interactions can prime someone to be ready for these events, which can make the transformation itself less stressful.

2.1.1.7 Sidebar 2a: Mezirow's Types of Learners

In ‘‘Education for Perspective Transformation: Women's Re-entry Programs in Community Colleges” (Mezirow and Marsick, 1978b), the report identifies many contexts a person might be engaging with the transformative process or the ways they can react to it. Some of these, like the ‘‘housewife learner,” are more specific to the population and sample focus of that study; others, like ‘‘emancipated learners” are more generally applicable to any learner.

My research does not spend much time differentiating the types of learners and what these categories mean for learner engagement with the transformative learning process because this is seldom discussed in the studies in this analysis. The reason

for this lack of discussion in the sources I found is unclear, but I would imagine that it is related to how some of the categories are very specific to the re-entry programs for women during the time of Mezirow and Marsick's original investigation, which aren't as easily applicable to the current and more generalizable perspective on transformation learning theory.

That said, since the goal of this exploration is to provide a baseline for how transformative learning theory could be used in higher education programs, it is important to recognize that any programs or processes for TL could benefit from distinguishing types of learners that they are designed for or to be prepared for these different types of learners. Even if the specific categories described by Mezirow are not applicable, the idea of recognizing that students from different backgrounds may require specific resources is inherent in many of the criteria for TLT. Establishing new categories could be an additional direction for TLT studies.

2.2 The Transformative Learning Process, in Practice

The aforementioned criteria are all designed to scaffold and describe an educational procedure as core ideas that are likely necessary to ensure the kind of educational experience Mezirow was suggesting for the re-entry education programs.

In practice, transformative learning theory describes a process of learning where a person changes their frame(s) of reference (Mezirow, 1997). The term ‘‘frame of reference" covers a broad range of an individual's cognitive and emotional perceptions of how they interact with the world, and further breaks down into two more specific terms: ‘‘habits of mind" and ‘‘point of view." Habits of mind (abbreviated, HoM) refers to a pattern of broad or abstract beliefs a person holds and their general tendencies related to cultural, social, educational, economic, political, or psychologi-

cal ideas. A point of view (abbreviated, PoV) is a perspective about a specific topic, which may or may not align with the pattern or tendencies of their habits of mind. The terms of HoM and PoV are used primarily to distinguish between them in a specific transformation experience; the term ‘‘frame of reference” encompasses both terms when discussing the theoretical basis of TLT.

In the case of the women in the re-entry programs, many frames of reference were related to the students' own identities as women; later, Mezirow also connected frames of reference to ideas of racial discrimination, saying that beliefs about a particular group being superior or inferior was also a frame. For an example easily spread into multiple influences, consider how a person might understand themselves to be ‘‘conservative” or ‘‘liberal” in a general sense that suggests a set of assumptions or a lens on how they will generally analyze social information, which is a habit of mind. This same person would simultaneously have opinions and assumptions on a laundry list of political policies. Their specific response to a given policy - their response to a new immigration law, their response to central economic planning, their response to the Supreme Court's rule of Right to Privacy - would each constitute a point of view. While it is likely for the broader habits of mind and the more specific points of view to overlap, it isn't necessary for them to be aligned on any particular stance, or even a majority of them.

A core conjecture of transformative learning theory is that, in general, a person's frames of reference exist in a state of homeostasis or equilibrium. People have assumptions about their own purpose in the world that serve as lenses for how they understand their experiences (Mezirow, 1997), and if they do not interact or engage with a force that challenges their frames of reference, then there is little reason for these to change. Thus, transformative learning is built upon challenging these assumptions.

Since a given person's frames of reference often shape the way they act socially

and culturally - a concept Mezirow labels "responsible agency" - then the learning process is one that can guide and shape a person's behavior to be receptive and integrative to the experience of one's self and others. Transformative learning theory, then, concerns the educational and learning processes that can foster transformative learning, and thus foster changes in a person's frame of reference and social behavior.

This is referred to as the "transformative learning process," the one in which a person starts at homeostasis, begins with all of their assumptions and beliefs about the world, and ends with a considered or changed perspective in a new homeostasis. While the exact details of the framework, order of steps to transformation, and the decision to include more than ten steps is debated (e.g., Moore, 2005), the most recent model refined by Mezirow (2009, 1997) can be summarized as:

1. A person faces what is called a "disorienting dilemma," where a person begins in their state of equilibrium but is met with an experience that is incongruent with what they think should occur or observe. This step is largely experiential; a person needs to directly interact with something that is disorienting to their equilibrium and makes them question their existing perspectives.

2. The exposure to the dilemma causes a disruption in the person's feelings or perspective. In Mezirow's description, this usually prompts strong internal conflict such as guilt or shame (see Sidebar2c for more elaboration). This internal conflict is primarily an affective component that spurs a person into action.

3. The feelings that emerge in the previous step are recognized as an incongruent with a frame of reference, which leads to some assessment as to the source. This step is largely metacognitive, where a person not only realizes that they have been disrupted, but also considers how and why their frames were disoriented.

4. A secondary metacognitive step requires that the person acknowledges that discontent, change, and curiosity are not unique or detrimental; rather, they are a part of growth and transformation. In effect, a person must believe that being exposed to new ideas is not a bad process or one to be avoided.

5. The person considers and explores new options for frames, habits, and perspectives that could restore homeostasis. Now that the person has been distorted, has figured out where their assumptions were incongruent, and is willing to engage in the transformative experience, they consider what adaptions or new perspectives may be applicable. Depending on the nature of the dilemma and frame of reference, this exploration can include roles of how one acts, relationships of how one views and interacts with others, and general action or decision making.

6. From the generated ideas, the person plans a course of action for how to develop what will become their new homeostasis. This plan can include what experiences they need to make a decision, changing routines so that actions will reflect this new frame of reference, accessing practice to new skills, and the like.

7. Following part of the previously developed plan, a person acquires any information or skills that they need for trying their possible options. For example, someone who has a pre-established assumption about the abilities of a demographic of people may learn about the history of how such assumptions came to be and how they became aware of them.

8. With these new skills, the person has the opportunity to practice and test the new frame(s) of reference in real social situations. They may encounter situations similar to the one that previously disoriented them, face it with their new perspective, and observe the changes. This follows a similar pattern

as step five in that it can include a person taking a new social role, consider relationships of how one views others, or integrating new habitual actions.

9. After the testing period, a person knows what skills and experiences they need to fully embody their new frame of reference. While they may have gained some rudimentary skills in order to explore one of their options, they can now focus on developing and mastering that skillset. Using the examples of liberalism and conservatism from earlier, a person who aims to switch their economic practices to or from one side of the spectrum may have previously engaged in minute practices for testing, but now becomes comfortable in making them regular occurrences.

10. Finally, with skills fully developed, the person can re-establish homeostasis by integrating their new frame of reference into their regular life.

Transformation Corner: Riley's Growing Pains

This time, our case example is Riley, who firmly beliefs that a child's behavior is the result of nature, heredity, and other pre-determined factors. Their subsequent social action is that whenever they interact with children, Riley describes deviant or undesired behavior as being a "bad kid" and claims that such children should be restrained as there isn't any meaningful way to change their behavior. A transformation follows with these ten steps:

1) Riley visits their best friend, Akira, shortly after Akira adopts a daughter, Melanie. Riley observes Melanie behaving in ways they view as inappropriate, such as running in the house and speaking over others. Riley expresses pity to Akira for "having a bad seed" - but then Akira calls to, coaxes, and explains to Melanie about appropriate behavior when company is around. Melanie's demeanor changes not just in that moment, but consistently when Riley visits months later.
2) Riley is shocked by this change; it directly counters their existing assumption.
3) This shock makes Riley consider how thinking behavior was only genetic is unfair to Akira, who puts copious work into raising a child who has now changed.
4) Thinking that the belief of being a bad kid might have resulted from being told that as a child, Riley decides to consider what other options may explain Melanie's behavior.
5) For a new frame, Riley must decide whether Akira and Melanie are an exception to the rule or if their assumptions are incorrect. With their priority being to make amends and have a better view of Akira, Riley opts to consider that the assumptions may have been wrong. Perhaps children are more readily impacted by care, modeling, and overt teaching.
6) As someone who doesn't usually interact with kids, Riley considers where they might be able to observe parent-child interactions. Riley doesn't want to impose on Akira, so they make notes about visiting a park and watching families while shopping.
7) Careful to not fall back onto old habits, Riley scribbles a note to not write off bad behavior and to pay attention to how parents and children react to one another.
8) True to the plan, Riley watches families in a public park and listens into conversations at the grocery store. They see and hear a wide variety of interactions, including those that fits the previous assumption (children acting regardless of their parent's response), to those similar to Akira (children and parents successfully negotiating behavior), and those that seem far removed (children who are quiet and attentive, despite the parents' inappropriate behavior).
9) With these observations, Riley is ready to establish that while nature and heredity still play a role - there are some children who seem unaffected by parenting - there are many other circumstances which the opposite is true or where nature can't seem to explain the observed notes. When out in public, Riley practices watching these dynamics and seeing if they can explain or accept them.
10) By the time Riley visits Akira again, the dynamic has changed, and Riley is no longer surprised by Melanie's behavior. Riley is able to compliment Akira on her parenting.

This transformation only focused on one idea and a small list of possible new perspectives – it didn't cycle back to previous steps, and breaking down Riley's definition of "inappropriate" behavior could be an entirely separate process! But there are many integral factors of TLT here that will be explained in the subsequent sections. As I continue to describe the criteria and outcomes of a transformative learning experience, consider Riley - or an experience of your own that you are more familiar with.

2.2.0.1 Sidebar 2b: Disorienting and Distorting Dilemmas

When listing the steps of the transformative learning process, the first step includes an event called the ‘‘disorienting dilemma”; this is a common and recognizable term in transformative learning theory. In Mezirow's steps (2009, 1997), it serves as an inciting incident for the transformative process and represents many of the core philosophies of what transformation should entail: an individual experience, a challenge to a person's assumptions about the world, and an influence over social and cultural actions a person takes. Shortly in Section 2.2.1, I will go over additional details of what these dilemmas can look like and the kinds of reflections they cause; for now, though, a bit of nomenclature from the discipline.

In existing TLT literature, this dilemma is sometimes referred to as both the ‘‘disorienting dilemma” and the ‘‘distorting dilemma” (Laros, 2017). The term ‘‘disorienting” directly refers to how a person's homeostasis of assumptions is pushed to disequilibrium and then has to re-orient based on the new information. The dilemma is the experience or event that challenges the existing assumptions, and the disorientation is what occurs to the person going through the transformative process.

My understanding is that the terms ‘‘disorienting” and ‘‘distorting” are synonymous, as I have yet to find any literature that describes substantial differences between the two. For the remainder of this document, I will be referring to this event as the disorienting dilemma, which seems to be the more common of the two terms.

2.2.0.2 Sidebar 2c: Guilt, Shame, and Other Emotions that Spur Action

In Mezirow's writings about the steps of transformative learning (1993) and some of the legacy writings that follow it (e.g., Brieseet al. 2020), the second step of transformative learning necessitates ‘‘self-examination with feelings of guilt or shame” (Mezirow, 1993). The intention behind this seems to be that if the disorienting dilemma doesn't evoke a strong affective reaction from a person, or at least not a

strong reaction that they can reflect on, then it won't prompt an actionable transformation process.

The specificity of referring to the evoked feelings as "guilt and shame" isn't fully explained. This makes some sense, as Mezirow described that for many women in re-entry programs (Mezirow & Maserick, 1978b), this dilemma came in the form of a negative outside source such as a divorce or loss of a job. Under the assumption that these women were entrenched in negative gender stereotypes, these events often invoked such negative emotions.

However, as a reader, I have yet to find any legacy studies that explore why guilt and shame are specifically important or necessary to the transformative process. To the contrary, when analyzing studies for my sources, none directly reference that the transformative processes described were designed to evoke guilt or shame. If anything, these systems emphasized curiosity (e.g., Younis, 2021), a desire for higher achievement (e.g., Logan, 2013), or empathy (e.g., Grob, 2021). This is more in line with some of Mezirow's later revisions to transformative learning theory, such as the inclusion of a holistic, welcoming environment that is likely to reduce cognitive stress (see Section 2.1.1). So while the inclusion of guilt and shame is partially understood from the original context, the existing domain seems to have an expanded idea of what a dilemma can look like that doesn't require it to be a negative experience.

For the purposes of the coding and analysis for my study, the second step of the transformative process is seen as an affective one that does benefit from strong emotion, but I did not enforce any requirement on what that affective response should be - guilt, shame, curiosity, empathy, or otherwise. I argue that this is more in line with the principles of transformative learning theory. Even if it isn't, it was a necessary decision to include studies that didn't rely on shame and guilt, as virtually none of my sources made mention of this criteria.

2.2.1 Types and Impacts of Disorienting Dilemmas

A disorienting dilemma, by definition, is what prompts a person to reflect on and potentially change their frames of reference (Mezirow, 1990). These changes can be drastic, such as developing an entirely different perspective, or they can be subtle, such as maintaining a largely similar perspective but elaborating on existing frames to be nuanced and well-defined. Regardless, the focus is on having to analyze, explain, and adapt these frames of reference.

In the two works that would become the foundation for transformative learning theory - Mezirow's ‘‘Perspective transformation" (1978a) and ‘‘Transformative learning: Theory to practice" (1997) - Mezirow suggested that the distortion and self-reflection a person experiences in the transformative process takes one (or more) of three forms: *epistemic*, *sociocultural*, and *psychic*. This doesn't mean that a person's transformation is limited to three domains, but rather, inciting dilemma and subsequent reflection are categorized this way. The subsequent transformation to frames of reference don't necessarily fall into these categories.

2.2.1.1 Epistemic Dilemmas & Reflection

An *epistemic* dilemma concerns knowledge and information. (This is not the same as simply being exposed to new information, as it must still meet the general criteria of creating some internal equilibrium or questioning of one's regular actions.) A person holds a ‘‘truth" about how the world functions and acts as if this information were true, but then discovers that this truth is not actually axiomatic. For example, there is a long-standing bias that so-labelled ‘‘social" sciences (psychology, anthropology, economics, etc.) are not scientifically rigorous, and thus labelled as ‘‘soft" or ‘‘improper" science. An instructor who holds this belief may guide an apprentice to these disciplines on the belief that they do not require as much scientific knowledge; however, if this same instructor is exposed to philosophies of science

and research methodology, this experience may distort the assumption of a lack of scientific rigor and subsequently change how they guide new learners.

2.2.1.2 Sociocultural Dilemmas & Reflection

Sociocultural dilemmas concern social belief systems, social power or hierarchies, and norms or status quo. An easily recognizable dilemma can come from a person who believes all people of a particular demographic or subgroup are inept at a particular task, but then observes an individual who demonstrates this skill (the "one of the good ones" phenomenon). Sociocultural dilemmas are usually rooted in false premises perpetuated by a static ideology; that is, an incorrect assumption that is regarded as true without critical thought. Thus, the distorting and transformative experience occurs around challenging an established ideology.

2.2.1.3 Psychic Dilemmas & Reflection

Psychic, in this case, refers to an individual's mental or psychological status in relation to how they view themselves. Subsequently, psychic dilemmas concern beliefs or anxiety about one's ability to act in the world. This includes both assumptions of how one will act in a specific situation (e.g., if I go to this location, I will become upset) and beliefs about consequences for one's actions (e.g., if I confront this problem, I will be fired). Usually, these assumptions cause an inability to act, which can then create the conflict for the dilemma.

2.3 Sidebar 2d: Other Debates in the Domain of TL, and their Relevance to The Current Study

There are a few additional niche debates in transformative learning theory literature that do not get resolved or addressed here, but did directly influence decisions I

made about the theoretical underpinning and methodology of the current study. For readers who aren't already familiar with the literature domain of TLT, they might provide some additional context as to the groundwork of my investigation, but ultimately aren't essential for understanding how a TLT framework could be useful in higher education. For readers who are familiar with the deeper debates in TLT, this should answer questions about how I position myself for the purposes of this investigation.

2.3.0.1 Debate 1: The Inclusion of Psychic Dilemmas

When introducing the concept of the distorting/disorienting dilemma (Section 2.2.1), three types of reflection and dilemma were introduced: epistemic, sociocultural, and psychic. These three are the ones presented by Mezirow during the theory's inception.

However, in the literature reviewed for this analysis, most authors didn't distinguish between these categories. Instead, they refer to distorting dilemmas and their subsequent transformations as an amalgamated, singular concept that can contain all forms of dilemmas. In higher education research specifically, transformation seems to primarily involve epistemic dilemmas, with sociocultural being secondarily. While psychic dilemmas are not explicitly mentioned as excluded, the kinds of dilemmas discussed in the studies suggest an orientation away from psychic ones.

I assume that part of the reason for this is pragmatic - epistemic and sociocultural dilemmas are more easily connected to higher education, and thus, more relevant to talk about. While the investigations of transformative learning theory used in mt analysis are largely concerned with school environments and academia, psychic dilemmas feel personal, referring to mental health, motivation, and self-concept almost by definition. Thus, they might be left out simply by omission of the subjects of interest (e.g., Kutcher & Wei, 2012), where psychic assumptions can seem outside the realm

of academics.

For the remainder of this manuscript, I will be referring to distorting dilemmas in a general sense, with psychic dilemmas included in discussion. However, I acknowledge that they may not be well-represented in my writing given the institutional contexts and subject matter of my sources do not explicitly refer to or differentiate types of dilemmas.

2.3.0.2 Debate 2: Age of Transformation

In many of Mezirow's early writings about transformative learning, he posited that TL could only really begin around late adolescence and adulthood; children wouldn't have transformative experiences in the same way (Mezirow, 2000). After he published this idea, many other authors came to challenge this perspective, suggesting that children could, under the right circumstances, have transformative experiences (Kegan, 2000; Schugurensky, 2002; O'Sullivan 2002). This prompted one of the earliest binary debates in TL: determining whether or not it was limited to adult learners (Heaton, 2020).

The debate seems to come down to when it is believed a person has established frames of reference and becomes capable of the self-reflection necessary for transformation. Mezirow originally justified his perspective by declaring that during the formative period of childhood, many of the cognitive components necessary for transformation were unavailable. Components like having a sense of agency to explore new options (step 4), diverse socialization opportunities that would allow for challenging dialogue (step 6), and the freedom to put new perspectives into action with society (step 10) were, according to Mezirow, unavailable until at least late adolescence.

The contention posed by other authors suggests that while transformative experiences might be *more likely* for adults, there is little reason to exclude the possibility of children from this process. In some respects, the very concept of Theory of Mind

- a person's capacity to recognize different mental perspectives in others, which develops in childhood - suggests that children would be able to acknowledge dilemmas and differences in frame of reference before reaching school age.

Since this investigation focuses on higher education and adult learners, my decision of whether or not to define an age or cognitive ability cutoff where a person becomes "eligible" for transformative experiences is largely moot; however, for the purposes of adapting transformative learning practices to other educational systems, I reiterate this debate and suggest it worthy of its own sub-discipline for future investigation.

2.3.0.3 Debate 3: Time and Scope of Distorting

Transformative learning theory literature has debated whether or not this distorting dilemma takes the form of a single jarring event (akin to disrupting homeostasis) or whether it might occur over a period of exposure to new ideas.

In Mezirow's original writings ('78/'90), he described the distorting dilemma as a singular incident, akin to the example of women facing divorce or with the fictional case of Riley and Melanie (Section 2.2). A person has an existing frame of reference in isolation, and direct exposure to a conflicting perspective creates this dilemma. Clark (1992) later suggested that the dilemma did not always take the form of a single event, but rather could come from an elongated period of dissatisfaction. Opinions on whether the dilemma stretch along this spectrum, with some holding Mezirow's original belief of the dilemma as a singular instance and others adopting Clark's.

For the purposes of this investigation, both forms of the disrupting dilemma were accepted, as were studies that were ambiguous as to the nature of their disruption.

2.3.0.4 Debate 4: The Role and Nature of Content in Transformative Learning

For many readers who have been raised in a content-based education system that suggests memorization and a vast archive of knowledge are indicative of skill, many of the core philosophies around transformative learning can seem lacking. They do not, to any great effect, address the subjects, expertise, or skillset that an individual may have or require to achieve competency or mastery in a particular field. While transformative learning theory discusses the environments, history, social politics, individual influence, communicative action, and the ‘‘hows” of teaching and learning, it only makes broad allusions to the ‘‘what” of learning.

This concept is best summarized by Mezirow in a single sentence: ‘‘New information is only a resource in the adult learning process” (Mezirow, 1997, p. 10).

Transformative learning theory is largely blasé to the idea of content learning. While this is likely related to the foundation of TLT as being developed for adults (and thus, removed from ideas of basic content like language and arithmetic), it also describes a process in which a person grows by changing the way they think about or engage with a conflicting perspective they see in the world. ‘‘Perspective” in this context does not strictly refer to ideas or opinions expressed by other people, but rather, to assumed understandings and truth about how the world functions. While content knowledge may be included or necessary in this process, it is not the main focus.

As with many critical thinking practices, the key ideas of TLT are focused around self-reflection and evaluation of direct experiences that a person has. Having a person read or be told about best teaching practices and their effectiveness can help in this process - perhaps by introducing an instructor to a practice they didn’t know about - but the actual transformation is contingent on their own experience of having an assumption and seeing that assumption challenged. Rather than be told what is or

is not true, transformation requires a person question what they believe to be true.

Transformative learning theory holds an (intentional) double standard suggesting that while content information *can* promote change, an environment can also be transformative without it. The external experiences that a person encounters and subsequently questions could in some ways be based in content; such exists at the foundation of educational psychology where scientific studies can often seek to validate or refute ‘‘common sense” ideas.

For example, there is a well-known belief in the United States of a concept called the ‘‘mid-life crisis” where a person in middle adulthood will experience a crisis of worth that results in needing a substantial change to lifestyle, career, social circle, and the like. We can envision that an individual might believe that the mid-life crisis is a commonplace occurrence, but scientific study in the discipline suggests otherwise (Vaillant, 2012), with only a small fraction of the country's population actually experiencing it. In this case, it's possible for a person to have a presupposition of a mid-life crisis as a norm, and thus rely on it as an explanation or justification for behavior they observe in other people. However, the scientific data could then serve as a distorting dilemma that would require a person to find a different justification when observing such crisis behavior (or consider why the crisis they are observing fits within the small fraction). In this way, content knowledge or academic learning serves as a foil and tool with which one can be disrupted and seek out new understandings.

However, a transformative experience is not guaranteed in this situation, as it still relies on a person being willing to trust the source, question why they held that belief in the first place, and generate new explanations for observed behavior. Otherwise, content information may be limited to a series of facts and ideas that are not elaborated upon, which returns to the banking model.

For the purposes of this investigation, content-based interventions of transformative learning are not excluded; in fact, they make up a majority of the domain-specific

investigations mentioned earlier. However, since content is only a supplemental part of the transformative experience, no specific content requirement was established in the construct definition.

2.3.1 Scaffolding a Transformative Process

These dilemmas and reflections are only the first part of the transformative process; naturally, observing a conflicting perspective is not enough to change one. The foundation for understanding the rest of the TL process comes from Mezirow's original study (1978a), and transformative learning theory itself was later built on that foundation (1991, 2000, 2009, 2011). The ten-step sequence originally proposed by Mezirow has received the most attention in the literature, but conceptually transformative learning theory is more about scaffolding the transformative experience in a learning environment (Heddy & Pugh, 2015).

Although transformative learning theory suggests that the transformative process is one a person must experience themselves, it is important to remember that it isn't strictly a self-regulated process. Mezirow's design began with the idea that women in the re-entry programs were capable of being transformed learners, but were inhibited by previous frames of reference or the disturbance caused by their dilemma.

At most any point in the preceding ten steps, it is possible that a person may struggle to engage with the step on their own and benefit from outside support. For example, if an individual struggles to see that allowing transformative change is worthwhile (Step 4), this could be supported with examples and interpersonal comfort. Similarly, if a person has planned a series of skills that they need to learn but feel incapable of doing so on their own (Step 7), they might seek out a specialist or environment that can promote learning these skills of helping them ‘‘know what they don't know."

2.4 Applying Transformative Learning Theory to Higher Education Instruction

Part of the gap in literature described in the introductory chapter (Section 1.2.1) is noting that studies into transformative learning theory tend to err on either being extremely precise, akin to using transformative practices in an individual classroom, or overly general, such as exploring what the main ideas of transformation are. Studies akin to Mezirow's original, that both are focused on specific program evaluation but also the criteria behind molding this process, are significantly less in number and often not empirical in nature.

A call for additional empirical and quantitative support to transformative learning has only recently been made (e.g., Walker 2018, Brock 2015). While the roots of perspective transformation came from a classroom environment, many subsequent discussions have focused on defining and investigating what form(s) transformative learning takes. Mezirow's works themselves (1978a/b, 1990, 2000, 2009) are an example, with seminal pieces continuing to revise and define the theory, but other major contributions follow a similar trend of using smaller examples of transformation to refine and refocus the theory itself (e.g., King, 2009, Rush, 2008; Cranton 2006). Despite domain agreement on what some of the pivotal criteria of transformation are, a lot of discourse goes into the construct definitions behind transformation, reflection, and frames of reference rather than finding ways to implement them (Christie et al., 2015).

Don't misinterpret this assessment as saying that quantitative and empirical research on developing transformative learning practices in educational settings doesn't exist; it does, in both assessments of transformative learning skills and specific environments where it has been applied (e.g., Fetherston & Kelly, 2007). Particularly in the former, TLT has been used as a framework to analyze educational practices in

a variety of domains and determine how deep and meaningful learning manifests in educational environments. Just from postsecondary examples, TLT has been used in mental health training (Smith et al., 2014; Rush, 2008), art (Nangah, 2015), sustainability (Aboytes & Barth, 2020), healthcare (Boute, 2017), core college education (Lee Korns, 2018), and cultural awareness education (Zabarauskas, 2017), to list a few domains. Furthermore, a few assessments for transformative learning criteria have been developed and tested; the most recognized of these probably being the Transformative Learning Survey (Stuckey et al., 2013) but also including the Learning Activity Survey (King, 2009), Student Transformative Learning Record (Barthell et al., 2010), and the Survey of Transformative and Spiritual Dimensions of Higher Education (Duerr et al., 2003). Entire centers and consulting firms exist dedicated to implementing transformative learning practices in educational environments.

Between these, though, is the gap in the literature in attempting to use transformative learning theory as the basis for pedagogical principles compared to other practices. In the domain, there are many attempts to define the construct of transformation and use these constructs to assess when it is happening, and conversely numerous instances of trying to apply transformative learning criteria in specific educational settings (e.g., Apte, 2009; Glisczinski, 2007; Lotz-Sisitka et al., 2015).

From the student surveys and assessments that do exist, the influence of transformative learning practices appears to be generally positive, albeit inconsistent. Examples of post-intervention effects transformative learning interventions include improved test scores (Boonphadug & Seubsang, 2021), learners reporting increased levels of engagement (Younis, 2021), improved analysis and reflection (Dempsey, 2017), and improved ability to recognize and respond to a disorienting dilemma (Walker, 2018). This is in addition to the studies that have discussed implementing transformative learning in specific domains (e.g., mental health training, as above) where learners demonstrate stronger performance in discipline-specific skills.

Thus, another way to frame the goal of the current study to observe what programs and practices are currently being studied as implementations of transformative learning theory and to identify the core criteria that lead to successful outcomes. In Mezirow's case, it was focused more specifically on college re-entry programs that were then seen as relevant in other areas of education. My research focus is at a more general meso-level about higher education practices in a broader sense while still remaining applicable to classroom action.

2.5 An Abridged Review of Transformative Learning Theory

For those of you who want a quicker review of transformative learning theory (TLT) to introduce the core elements of my study, for those of you who reflect back of the highly theoretical review of the previous chapter, and for those who prefer writing to be as concise as possible - here is a review of everything covered in Chapter 2.

At its inception, TLT was not formed on the grounds of trying to develop a new educational practice or theory. The study that would become its roots had a much smaller scope in trying to identify ways to adapt an existing higher education model that was ill-favored for women who were returning to academia after spending years in working-class life. Some programs that attempted to support these women were successful; others were not. In the process of trying to differentiate successful programs and identify their common characteristics, the underpinning of transformative learning theory came to consider whether these same principles might generalize for many adult learners, or learners in general. This exploration came up with six major criteria (Section 2.1.1) to promote meaningful learning - critical reflection, individual experiences, dialogue, holistic orientation, awareness of context, and authentic

relationships. See Section 2.1.1 for a summary of these terms.

The educational opportunities and environments described by these criteria scaffold the ‘‘transformation” and ‘‘learning” in TLT. TLT eschews many of the information- and content-oriented ideas of traditional educational practices for a discussion of an individual's experiences when facing new information and perspectives. It suggests that meaningful learning is inherently social in nature and comes from the way we understand our own assumptions about how the world works and what occurs when those assumptions are challenged. A typical individual has a set of assumptions or beliefs of how they see the world (frames of mind, Section 2.2). Transformational learning comes from a person having a disorientation to their expected assumptions on how the world works and the ability to explore. After this disorientation to their assumptions, a person can choose to recognize the incongruence between their expectations and their experiences by engaging in a process of exploration (Section 2.2), trying to understand where the incongruence comes from and considering what other options might be available. These considerations may be minor, in the form of considering a context or circumstance they hadn't before, or might be substantial, in the form of completely changing the base assumption. These new considerations can be tested, evaluated, seen in action, and practiced before establishing a new homeostasis. This new homeostasis is considered a deeper and more meaningful type of learning as it shapes a person's general habits, actions, and ways of engaging both socially and professionally.

Despite the emphasis of transformative learning as an individual experience, substantial research suggests that it can be scaffolded into educational environments. Throughout its decades of existence, a substantial amount of TLT literature has remained in the domain of higher education; interventions exist for introducing transformative processes into individual classrooms, topics, and lessons with success. Moreover, its focus on process and re-orienting the way a person reacts to new

experiences is directly relevant to the stated goals of higher education.

However, the issue at hand is that the implementations and interventions for TLT in higher education tend to be small, isolated, or difficult to generalize to other institutions (Section 2.4). Thus, the goal of this exploration is to take the patterns and successes of these smaller interventions and see what options exist for generalizing them into institutional practices.

Chapter 3

Research Methodology & Design

This investigation directly responds to the last decade's call for quantitative evidence for transformative learning (e.g., Walker 2018, Brock 2015). It sought to use findings from existing literature to articulate foundational principles that could suggest specific practices or principles for transformative learning theory in higher education settings.

Specifically, this study looked at existing unpublished manuscripts that discussed a post-secondary education scenario (including undergraduate college, graduate schools, and other adult education programs) that included a condition where the educational experience was influenced by a transformative learning practice; these conditions ranged from isolated interventions developed specifically for research investigation and non-experimental studies from existing programs or practices that utilized characteristics of transformative learning. Outcome variables were most desirable if they concerned academic achievement, program success, or other post-secondary measures of success as determined by the specific program.

At the outset, the intended research method was to be mixed-methods meta-analysis, with the primary intention of determining the effect size indices for transformative learning interventions. Given the highly conceptual and abstract nature of many TLT manuscripts, my goal was to determine what characteristics of existing interventions yielded positive results. Then, details regarding the types and circum-

stances of interventions could be coded for qualitative characteristics to determine groups for analysis, such as institution type, intervention length, subject focus, characteristics of TL involved, and so on. A full description of these intended coding options is given in Section 3.2.1.

In practice, however, the fluid nature of the existing studies made it difficult to form a strong foundation for even this suggestion of analysis. While the methodology proposed here was made with sound reasoning, it was overzealous for the dataset that was ultimately collected and coded.

This chapter reviews the methodology for investigation as it was *intended* for posterity. This is done to better explain the purpose of the investigation and present an idea of what I interpret TLT discussions in higher education would benefit from. The following chapter (4) will break down the issues with the dataset that required this plan to change.

In simpler terms, the methodology presented in this chapter is the pristine, aspirational goal of the investigation; the next chapter will describe the murky practicality of what happened with imperfect data.

3.1 Choice of Educational Meta-Analysis

The foundation for analysis in this study was primarily based on Lipsey and Wilson's procedure for meta-analysis (Lipsey & Wilson, 2001), supplemented with more recent explanations of applying meta-analysis as they apply to educational research from Cooper (2015), Boyle, Connoly & MacKey (2016), Hattie, Rogers, & Swaminathan (2013), and Sánchez-Meca & Marin-Martinez (2010).

Lipsey & Wilson's (2001) overview of the purposes and applicability of meta-analysis focuses on two primary characteristics. First, studies eligible for meta-analysis inherently require an empirical/quantitative approach for both the proce-

dure itself and the studies used as data. Although there is a conceptual component to meta-analysis (Boyle et al., 2016; Cooper, 2015), its root focus as an empirical procedure serves this study's goal of trying to find quantitative evidence in a theoretical and conceptual discipline.

Moreover, Lipsey & Wilson's (2001) conceived strengths and weaknesses of meta-analysis similarly match well with the goals of this investigation. They suggest that the strengths of meta-analysis come from: 1) summarizing a range of research findings; 2) using a more sophisticated encoding practice to avoid potential pitfalls of seeing significance when there might not be; 3) providing insight into more nuanced relationships among data; and 4) pulling from a large number of studies. These strengths directly relate to the goals of the investigation, as: 1) summarizing findings was the goal of this study; 2) pitfalls of significance testing are more likely with the smaller samples used in these transformative learning studies; 3) the nuanced relationships of data are more apt to serve as a foundation for future investigations; and 4) while this investigation doesn't use the large number of studies other meta-analyses do, it can set a precedent.

In contrast, the weaknesses of meta-analysis come in the form of: 1) the potential for complexity of meta-analytic methods to obscure the intent of findings, 2) potential oversimplification or reduction of social impact of strict quantification; 3) the possibility of comparing studies or effect sizes that aren't realistically comparable; and 4) relying on a stable quality of studies to be analyzed. While still relevant to this study, several straightforward steps were attempted to mitigate the effects of these weaknesses. Namely: 1) intentionally using methods appropriate to the exploratory nature of this study; 2) the mixed-methods design allowing for some qualitative interpretation to include or re-introduce these social impacts; 3) completing a variety of analyses with differing strictness of criteria so that some represent a larger portion of the sample, but others are more representative of traditional meta-analysis; and

4) using dissertations and theses, which more extensive details about the quality of their methodology, to determine eligibility.

Beyond Lipsey & Wilson's more general frames around the strengths and weaknesses of meta-analysis, existing explorations can also corroborate why meta-analysis is suitable, and in some ways desirable, for educational research. From a theoretical perspective, the increased statistical rigor of meta-analytic procedures seems appropriate when talking about studies that are evaluating the usefulness of programs (Sánchez-Meca & Marin-Martinez, 2010) or used to make economic decisions for large institutions that impact educational practices (Knapp et al., 2009). Despite the idea of using systematic studies as evidence for these choices, it's easy for evidence to lose a sense of neutrality by way of what results are focused on or creating investigations to see desired results (Hattie et al., 2014). While meta-analysis isn't immune to this per se, practices like systematic review, coding validity, and large sample sizes are ways to mitigate them if done appropriately (Boyle et al., 2016). From a more practical perspective, modern developments in meta-analysis have created systems to accommodate for investigations that need to synthesize different concepts and effect sizes; given that educational outcomes run a wide gambit and might be similar conceptually but not methodologically (e.g., wanting to measure student outcomes using very different metrics like grades or graduation), educational research is a discipline that benefits from these procedures.

3.1.1 Some Tensions between Meta-Analysis and Transformative Learning Literature

Due to the heavily theoretical history in transformative learning theory and the construct inconsistency seen among empirical studies, the planned meta-analysis for this study was tailored to more closely fit the expected investigation. Meaningful meta-analysis in psychological and educational research relies strongly on being able

to determine similarity in construct definitions, outcome effects, and methodology between groups (Cooper, 2015). While the transformative learning domain does have a substantial theoretical foundation, the wide berth of defining criteria means that the limited number of quantitative investigations don't necessarily cover the same aspects. For example, consider the ten-step process considered for transformative learning - if an investigation would suggest that a transformative learning intervention improves educational outcomes, does it qualify if it utilizes only one step? Only a small cluster of related steps? Does it need to develop an intervention that covers the entire transformative process? What about the elements such as critical reflection, dialogue, and awareness of context? Does a training that focuses on just a person's critical reflection have the same meaning as one meant to holistically cover transformative learning?

This problem becomes twofold when considering outcome measures of studies that include transformative learning. While some interventions have focused on improving one's experience of the transformative learning process - say, for example, improving one's critical reflection skill that would promote later transformation - others have presented a transformative learning experience as instructional intervention in and of itself, where the outcome measure is success in a particular academic context.

None of these problems are wholly unique to transformative learning theory, and in many ways are the kinds of questions a good meta-analysis deals with. However, for TLT, which tends to invoke conceptual explanations instead of empirical ones, quantitative conclusions in the discipline would be more difficult. Using this investigation as a frame of reference, some of the typical meta-analysis concerns (described in the next section) had to be compared with those more specific to finding enough adequate comparisons in the TL literature to make a statistically reasonable analysis.

3.1.2 The Decision to use Dissertations and Theses

Early on in this investigation I considered whether it would be feasible to focus the studies of interest on those presented in dissertations and theses from graduate students. There were several reasons for wanting to do so, including a mix of conceptual and pragmatic explanations.

Additional details of these reasons are described more in Section 3.1 (regarding the importance of construct definitions) and Chapter 2 (regarding the changes to transformative learning literature over the years), but to summarize, the most important reasons for using dissertations and graduate theses instead of journal publications are:

1. Dissertations and theses do not have the space limitations often imposed in other published research, and instead have strict requirements to explain construct definitions of terms. Both of these factors means that these manuscripts will have more detailed explanations of how they refer to transformative learning concepts, coding for their analyses, and any additional context or factors needed to sort groups for analysis. This is particularly important because the multiple conceptual revisions of TLT mean that understanding the used definitions of terms like critical reflection are particularly important.

2. Unpublished graduate student research is not subject to the publication bias toward positive, statistically significant results (e.g., Ioannidis, 2005). This bias is also likely to be more extreme for transformative learning than it is in other disciplines, given that most of the publication venues and journals for TL focus on TL specifically and would be incentivized to focus on positive results. Although this would be true in all research, meta-analyses is particularly vulnerable to this kind of bias (Cooper, 2015).

3. Graduate students are nearer to their own educational experiences in higher ed-

ucation; given that my intention is to explore transformative learning in higher education specifically, it is possible that they could offer additional perspectives that would not be present in studies that are farther removed from this experience.

3.2 The Ideal Design & Search

With the aforementioned goals and adaptions accounted for, the initial design for this study was rooted in Lipsey and Wilson's (2001) suggested procedure for meta-analysis, with a few caveats:

1. Research questions were formed in such a way that a quantitative synthesis is meaningful. Although the open-ended nature of this study focuses more on guiding questions than strict hypotheses, this principle still applies.

2. Identifying suitable studies for investigation, which was attempted via the search terms and inclusion criteria (discussed shortly).

3. Encoding nominal and other qualitative characteristics of the studies to determine their eligibility for quantitative analysis.

    - Inclusion and exclusion criteria were re-adjusted during analyses, as well as noting whether the studies were homogenous enough to be viable for a fixed-effect model. This is further described in Chapter 4.

4. Choosing and encoding appropriate effect sizes, which was attempted in multiple ‘‘waves" ; in some instances using strict inclusion criteria akin to traditional meta-analysis, but in others using loose criteria more consistent with transformative learning literature (descriptions for criteria included later in this section).

5. Adjusting effect sizes and other encoded data for comparison; again, this procedure was be done several times to make multiple categories of analysis based on inclusion criteria.

    - Possibilities for statistical analysis are presented in 3.2.2

6. Inferential analysis on the resulting groups.

The dissertations and theses collected numbered 44 manuscripts; although a few manuscripts presented more than one analysis, the majority only presented one that was suitable for the research criteria to be included in analysis. Given that this was the norm for most studies, only one analysis was included from each study as to provide a more consistent construct definition while not risking bias from oversampling a single manuscript.

Eligible manuscripts were found using the ProQuest Dissertation and Thesis Global database. Search parameters included full text manuscripts of doctoral dissertations and master's theses published in English. Due to the prevalence of manuscripts labelled as qualitative or mixed-methods but still including quantitative results, most searches were conducted without any database qualifications for quantitative or empirical analysis; instead, I individually screened studies with eligible quantitative components.

In the search, terms were separated into "primary" or essential keywords (transformative learning, transformative learning theory, deep learning), "Keyword E" as terms that were related to the subject focus of adult education (college, higher education, university, postsecondary, post secondary, adult education), and "Keyword S" terms that directly referenced the subject of the studies (undergraduate, student, intervention, module). Searches were conducted with each permutation of Primary + Keyword E + Keyword S, except when the terms were identical beyond semantics (e.g., postsecondary and post secondary).

The first searches contained manuscripts between 2012 and the time of searching, with the intention of covering approximately ten years of work while passing the 2009 threshold for Mezirow's book containing the most recent revision of TLT. After desiring to have additional studies to allow for a variety of analyses and improved sample size, searches were then repeated for those between 1978 and 2012. Since the basis for TLT was published in 1978, publications prior to this point were excluded; since TLT as a term wasn't established until 1991, results between 1978-1991 were placed under additional scrutiny to ensure they related to the same construct.

Beyond the filters congruent with search terms, manuscripts were deemed eligible if they:

- Explicitly defined and included literature about transformative learning to corroborate with the constructs used in analysis
- Contained a quantitative analysis of the impact of a practice based in transformative learning theory (e.g., module, intervention, school program)
- Specified what aspects of transformative learning (e.g., specific steps or the entire transformative process) were being utilized in the study.
- Had an outcome measure that covered at least one of the following: academic performance (e.g., course scores), skill assessment in a domain-specific skill (e.g., receptiveness to cultural awareness training for mental health programs), or improvement of a skill utilized in the transformative learning process (e.g., training critical reflection).

3.2.1 Objects of Coding

Manuscripts were coded for the following:

- Manuscript Type (doctoral dissertation, master's thesis, or other)

- Year of publication
- Institution type at the time of publication, according to Carnegie Classification (e.g., RUH, D/PU, Master's, Special Focus 2-year, Special Focus 4-year)
- Subject focus of the program
- Methodological Design of the analysis
- Subject assignment (volunteer, nonrandom, random)
- Study or intervention duration (1 session, fixed number of sessions, semester-length, fixed number of weeks)
- Frequency of sessions
- Minutes or time spent per session
- Intervention type (designed, observed, or N/A)
- Student characteristics or demographics
- Transformative scope (the size of influence that the study or intervention is designed for, such as institutional, departmental, classroom, focus groups, etc.)
- Transformative learning characteristics utilized (denoted by either Mezirow's six criteria of TL or a step of the transformative learning process)
- Use or absence of direct instruction on transformative learning skills
- Inter-study (that is, a study that used transformative learning as an intervention to improve other educational skills, such as domain knowledge) or intra-study (that is, a study founded in educational pedagogy of TLT and designed to improve TLT skills or criteria, such as critical reflection)
- Statistical method used for analysis (e.g., regression by type, AN(C)OVA)

- Statistical output (e.g., standardized means, form of effect size)
- Significance and direction of findings
- Sample size (N) for both experimental and control group, as applicable

The majority of these items were picked for coding to provide data that would directly build on the guiding questions established in Section 1.3.1. Specifically:

1. **Specific outcome measures in higher education:** subject focus of the program, study or intervention duration, transformative learning characteristics utilized, statistic used, effect size, significance
2. **Utilized characteristics, criteria, or elements of TLT:** transformative scope, transformative learning characteristics utilized, use of direct instruction
3. **Themes among successful TL practices:** subject focus of the program, study or intervention duration, frequency of sessions, minutes or time spent per session, intervention type, student characteristics, inter-study or intra-study
4. **Bases for a template for institutional practices:** subject focus of the program, study or intervention duration, frequency of sessions, minutes or time spent per session, intervention type, student characteristics, transformative learning characteristics utilized, use of direct instruction

The remaining items for analysis (manuscript type, year of publication, institution type, methodological design of the analysis, subject assignment, and N) were included either because a) they might be influential to the inferential analysis of the viability for particular studies, or b) their ease of access for coding and possible qualitative impact on the use of transformative learning practices as a whole. For example, while specifying the institution type where an investigation took place doesn't directly speak to the influences of TLT (it doesn't even necessitate that

sample covered in the study includes students of an institution of the same type), matching the institution to its Carnegie Classification at time of publication is a coding item that doesn't require interpretation from me as a researcher and could still be meaningful to the domain as a whole. Similarly, while the methodological design of a given study doesn't necessarily dictate the impact of the transformative learning outcomes, it might serve as a meta-point for the viability of a particular study to be included in analyses.

3.2.2 Intended Analysis

Since the analyses of this study are meant to be fundamental and exploratory in nature, the intention was to keep the group comparisons simple but numerous, thus identifying areas for continued study. Lipsey and Wilson suggest several methods for doing so, as do Cooper (2015), Boyle, Connoly & MacKey (2016), Hattie, Rogers, & Swaminathan (2013), and Sánchez-Meca & Marin-Martinez (2010). Although many of the more complex suggestions ended up being unusable with the existing dataset, considered options included standardized direct calculation of average effect sizes, dichotomous correlation coefficients, and ANOVA via moderator variables.

Part of the issue with declaring or identifying a procedure suitable for analysis of TLT was discussed in Section 3.1.1: the lack of consistent outcome variables and definitions between investigations. Some procedures, like ANOVA with a moderator variable, are only going to be comparable if enough of the studies share similar outcome variables for their effect sizes. While this was considered in the planning process, it ultimately wasn't feasible given the lack of explicit descriptions of variables provided in most studies.

This shortcoming was somewhat planned for before the analysis. I intended to use multiple tiers and sub-groups of analysis, with smaller sets that have more specific and exclusive definition and larger sets containing many data points but with less

consistent and more ambiguous construct definitions. The data was planned to be split into both large categories that were more liberal with inclusion criteria, such as ‘‘academic outcome measures,” and small categories that used precise measures where possible. Explicit descriptions on how many and what kind of variables are included in Chapter 4 for readers to evaluate on their own.

The goal of having multiple analyses across this spectrum was not to find a ‘‘best” of each, but rather to serve as a source of qualitative commentary on the field as a whole. While it would be ideal for all analysis to maintain nigh-perfect conceptual coherence for meta-analysis, only comparing studies with exact coherence would result in only small sample sizes, which is already an issue for the domain. Analyses that sample from a larger number of studies could provide a more accurate statistical representation of the findings, even if the coherence is stretched in order to do so. This tradeoff is one acknowledged in meta-analysis literature in general, and rather than limit to only one approach (close coherence but small samples or wide coherence with dangers to the interpretability of the analysis), the aim was to do both and present them as clearly distinguished with their respective limitations.

3.2.2.1 Homogeneity

Given some of the analyses are going to have wider inclusion criteria, analyses presented here do not assume homogeneity of variance. Even if a conventional test for homogeneity suggested equal variance, boundaries of conventional analysis were already stretched by having different characteristics of subject pools or outcome variables. Adding a slightly more complex step of assuming heterogeneity seemed appropriate given the number of other assumptions that were already ignored.

For any subsets of analysis where homogeneity of variances could be theoretically sound or is necessary for an ANOVA with moderator, testing homogeneity via sample means (e.g., Levene’s test) was deemed the most appropriate given the potentially

small sample sizes.

3.2.3 Checks and Evidence for Reliability and Validity

Throughout analysis, several checks for reliability/precision of data were included, based on the APA Educational and Psychological Testing standards (2014).

3.2.3.1 Construct Validity of Data

In Chapter 2 and Section 3.1.2, I have already described the ongoing issue of transformative learning theory's abstract nature, meaning that any given investigation might define the concept in a unique way or be utilizing a specific component that falls under the ‘‘umbrella" of TLT.

This is part of the reason for choosing dissertations and theses as the subjects for this meta-analysis. Using manuscripts that have longer descriptions of their constructs and operationalization provided more detail for me to work with in ensuring consistent of constructs when coding studies.

3.2.3.2 Intra/Inter-coder Reliability

Reliability testing for coding of the studies came in two parts: the first being intra-coding reliability for the author (primary coder), and the second inter-coder reliability using two trained assistants unfamiliar with the discipline.

Coding characteristics that are strictly observational and recorded by either the manuscript itself or the database (manuscript type, year of publication, institution type) are taken care of in the author's data collection.

For all other characteristics (that rely on qualitative or mixed-methods components), a coding sheet listing viable item responses (e.g., nominal answers for intervention type as designed, observed, or N/A, and interval values of statistical output) was designed. Each item was to be coded independently and collected with ReCal

OIR. Intracoder reliability for both primary and secondary coders was estimated by inputting values of separate coding instances of the same coder; intercoder reliability was estimated with the same instance of both coders.

In both cases, the expectation was for a Kappa statistic greater than 0.8, with disputes remaining after this value planning to be resolved by discussion.

Due to some of the coded information being strictly descriptive and non-negotiable, some coded variables were excluded from reliability testing. This was done primarily to avoid inflating calculations of reliability by oversaturating the presented reliability tests with coded items that were not subject to coder or researcher judgement (e.g., Carnegie classification) or codes (e.g., significance values of statistical output), since congruence or incongruence of these codes will be identical to the output itself.

As part of this process, coded items were defined as identical if one coded item was an equivalent subset of another. For example, coding the methodology of a study as ‘‘mixed methods" and ‘‘explanatory mixed methods" were decreed equivalent for the purpose of reliability, but ‘‘mixed methods (nonspecific)" and ‘‘mixed methods action research" were not.

Kappa statistics for the initial reliability codes that was subject to inter- and intra-coder reliability are show in Table 3.1. Coded items not listed in the table were not included in reliability analysis.

The majority of coded variables meet the accepted Krippendorff α greater than 0.80 without any additional discussion of disputes. The primary concerns from the initial coding were for subject focus, transformative characteristic used, and determining between inter- or intra-domain studies. In each case, discrepancy in coding was handled via discussion to find the source of disagreement; this discussion yielded clear reasons for the differences in codes that were easily changed. For subject focuses, differences in coding involved using different terms for similar concepts (E.g., study abroad education vs international education); for transformative characteris-

Table 3.1

Intra & Inter-coder Reliability

Coded Item	**Intracoder**	**Intercoder (1)**	**Intercoder (2)**	**Summative**
Subject Focus	0.772	0.805	0.772	0.75
Methodology	1	0.775	0.825	0.817
Participant Sampling	1	0.891	0.948	0.929
Participant Assignment	1	0.947	0.947	0.964
Study v Intervention	1	0.943	1	0.971
Frequency	1	0.963	0.963	0.962
Intervention Type	1	0.945	0.945	0.963
Demographics	1	0.85	0.923	0.899
Transformative Scope	0.809	0.845	0.962	0.884
Transformative Characteristics Used	0.965	0.545	0.538	0.682
Inter vs Intra	0.868	0.632	0.746	0.766
Statistical Method	0.969	0.876	0.9856	0.881

tics, differences were between the author noting multiple transformative characteristics and the secondary coders only noting one; for inter vs intra the differences came from distinguishing if subject focuses that could be the direct result of transformative learning counted as intra-domain (e.g., "cultural competence"). Once these issues were discussed, reliability for these three categories matched to the others.

3.2.3.3 Publication Bias

As stated previously in Section 3.1.2, part of the reason for using dissertations and theses as the foundation for this analysis is the ability to find the specific subset of investigations that focused on the use of transformative learning theory practices in higher education settings while being at least partially removed from traditional publication biases.

This is particularly meaningful for the topic of transformative learning theory due to its increased traction within the past few decades (Ellis, 2021) and the rise of journals oriented around TLT, namely the Journal of Transformative Learning Theory. Although this increase in interest could in one way be a boon for a large

pool of studies to work with, the focused nature of such journals makes the option of using dissertations and theses - supervised but unpublished research - safer.

Chapter 4

The Murky Dataset and Changes to Practice

As mentioned in Chapter 3, the database search for studies found a total of 44 results that appeared suitable for inclusion in the meta-analysis. However, in the process of coding and selecting appropriate statistics to use for analysis, one of the initial concerns for this investigation appeared in greater magnitude than I had expected it to: nonspecific or inconsistent inclusions of "quantitative" analysis.

While every one of the 44 studies met the inclusion criteria described in section 3.2, some of these studies reacted to database search terms that were not fully described in the analysis or met the criteria in ways that made them incompatible for comparison to others. After the studies had been coded and interpreted, the initial 44 studies were given unique identifier numbers and sorted into smaller subsets based on their suitability for analysis. The resulting groups (and how they will be referred to from here on) were:

- Set 1A (all) refers to the entire dataset. Although not used for analysis, this was used for notation.
- Set 2A (standardizable) refers to the subset of Set 1A that provided enough data or information to calculate a standardizable or comparable effect size (Cohen's d, correlation coefficient, chi-square value, or fuzzy cognitive map

vertices) and compatible values for either control groups or population samples. This was the primary group used in analyses. This included eighteen studies.

- Set 2B (percentages) refers to the subset of Set 1A whose primary analysis came in the form of percentage totals or averages among a contained sample, but did not have any control group, population comparison, standard deviation, or standard error with which to calculate a standardized effect size. These were compared to themselves for secondary analyses but were kept distinct from set 2A. This included eleven studies.

- Set 2C (other outputs) refers to a subset of Set 1A whose studies included quantitative analysis, but outputs were not compatible with the first two groups (e.g., by using an output that was not standardizable). This included five studies.

- Set 2D (mixed methods) refers to a subset of Set 1A whose studies were appropriately mixed-methods, but either limited quantitative analysis to parts of the study that could not be used for analysis (e.g., only for demographic data) or did not include their quantitative results in the publication (e.g., excluding non-significant findings that would have otherwise been usable). This included ten studies.

This separation into groups also had another issue that clouded possible interpretations: the number of analyses (specifically, non-significant analyses) meant that the results were quickly becoming bloated with checks for assumptions and validity that were almost certain to fail.

For example, many of the analyses in Chapter 5 specifically use one-way ANOVA to compare difference among the studies regarding variables of the year of publication, institution type, and so on. Even readers who have an elementary understanding will notice a distinct lack of assumption testing for these; aside from a conceptual check

for homogeneity (which was accounted for statistically), you'll see a lack of checks for multicollinearity, distribution variance, and all other manner of necessary steps for authentic analyses. Although these were planned at the beginning, fragmented nature of the studies used for analysis meant that the information presented is already inadequate in most regards. It also excludes the possibility of more robust analyses that depend on strict comparisons of constructs , such as factor analysis, which would arguably be the ideal approach for understanding what aspects of TLT are the most effective.

This fragmented nature of the analyses and their limited sample size was, in part, compensated for with the inclusion of a Kruskal-Wallis test, where applicable.

The bottom line is that meeting or breaking many of these assumptions will do little to support the claims of this study, because there are other, more fundamental problems before they would become an issue. Instead of making the current study even more murky by presenting the breaking of these assumptions that could probably be seen from the outset, I have opted to present the findings in their simplest form - which appears to be the form that this domain needs if it is to advance onward.

4.1 Subsets & Tiers of Analysis

As stated in section 3.2, part of the planned methodology for this investigation was to create different tiers of analysis. This would primarily serve to allow for a mix of larger sets that have more substantive sample sizes at the cost of lose construct definitions, while also having smaller sets where the definitions are more rigorous. This section provides the full details of the sets and subsets.

In addition to these descriptions, Chapter 7 contains two quick-reference pages for the sets; one that provides a table of the subset names with their accompanying descriptions, and an image that shows the same.

The sets described in the previous section - 2A, 2B, and 2C - were the largest sets that contained both enough construct validity and similarity in statistical output to be used. Since the major defining difference between these subsets were the ability to be statistically compared, all other smaller groups with more refined criteria are subsets of these three. The sets were further broken down as follows:

Set 2A (standardizable outputs) was separated into:

- Set 3-A, (standardizable, academic) where the standardizable outputs were based on academic achievement outcomes. This contained six studies.
  - Set 3-A was further divided into 4-A1 (standardizable, academic, subject), where the academic outcomes were subject-specific, and 4-A2 (standardizable, academic, general), which focused on general student performance. Both of these groups had three studies.
- Set 3-B (standardizable, transformative skills), where the standardizable outputs were based on developing TLT skills or criteria. This contained ten studies.
  - Set 3-B was further divided into 4-B1 (standardizable, TLT reflection), where the outcomes focused on the TLT criterium of critical reflection, and 4-B2 (standardizable, TLT not-reflection), which did not focus on a specific TLT criterion. Both of these groups had five studies.
- Set 3-C, where the standardizable outputs did not qualify as assessing either academic achievements or transformative skills. This contained two studies.

Set 2B (% outputs) was separated into:

- Set 3%A (%, academic), where the standardizable outputs were based on academic achievement outcomes. This contained three studies.
  - Set 3%A was further divided into 4%A1 (%, academic, subject), where the academic outcomes were subject-specific, and 4%A2 (%, academic,

general), which focused on general student performance. The former contained one study, and the latter contained two.

- Set 3%B (%, transformative skills), where the standardizable outputs were based on developing TLT skills or criteria. This contained seven studies.
  - Set 3%B was further divided into 4%B1 (%, TLT reflection), where the outcomes focused on the TLT criterion of critical reflection, 4%B2, where the outcomes focused on the TLT criterion of individual experience ((%, TLT experience), and 4%B3 (%, TLT other), which did not focus on a specific TLT criterion. 4%B1 contained four studies, 4%B2 contained three, and 4%B3 contained one.
- Set 3%C, where the standardizable outputs did not qualify as assessing either academic achievements or transformative skills. This contained one study.

Set 2C (other outputs) was separated into:

- Set 3?A (other, academic), where the quantitative outputs were based on academic achievement outcomes. This contained two studies.
- Set 3?B (other, transformative), where the quantitative outputs were based on developing TLT skills or criteria. This contained one study.
- Set 3?C, where the quantitative outputs did not fit into either of the previous two sets. This contained two studies.

Since Set 2D did not contain data suitable for quantitative analysis, its cases were not divided into smaller sets.

4.2 Excluded Categories

As the groups and subgroups of data were created, it became clear that some of the data collected for this study would not be suitable for analysis simply by composition of the studies included. Specifically, these were datapoints that were collected, but were entirely or primarily homogenized between groups, therefore leaving nothing to analyze. The following variables, while recorded, do not show up in the results section for this reason:

- Manuscript Type - of the 44 studies used, 34 of them were labelled as doctoral dissertations, and the remaining ten had atypical ways of naming their manuscript, such as a Thesis for DoE or a Doctoral Study, that made it unclear what parameters the manuscripts were written under.

- Subject Focus -Although recorded for qualitative purposes, it quickly became clear that there were not enough subject-focused studies to allow for any reasonable comparison. Some studies were very specific in their subject focus, such as transpersonal psychology and global citizenship, while others were broad in art or online learning. This resulted in the previously discussed distinction of studies that did have a subject focus as opposed to those that did not.

- Methodological Design - given that almost all of the studies included were mixed methods assessments with quasi-experimental designs, there were not groups to distinguish between for analysis.

- Subject assignment was not always specified in the recorded studies, and those that did specify were almost entirely volunteer/convenience sampling.

- Study duration, frequency of sessions, and time per session was not applicable to most included studies; most interventions took the place of entire semesters or programs where information such as credit hours and class duration was

unavailable. For those that were more specific, such as a 5-day seminar or single session, there were not enough data points to create a group.

Chapter 5

Results

The forty-four studies included in the analysis are broken down into subsets described in Section 4.1, but a table describing the studies themselves and their references can be found it Chapter 7.

On the whole, the dissertations and graduate theses successfully fulfilled my objectives as described in Section 3.1.2: the construct definitions were vigorously described, as was the literature for how the authors understood TLT as a concept. Part of the reason my search yielded forty-four studies was because of a substantial number of hits that referred to TLT concepts but defined them in ways contradictory to the literature (a distinction I may not have been able to make otherwise).

However, these benefits came with accompanying drawbacks, most of which where the catalysts for murky methodology described in Chapter 4. Specifically, while each of the studies included did have some level of quantitative research, the actual relation to an implementation of TLT varied wildly. Some were exemplary of the kind of study that would see professional publication, using established measures for TLT skills with academic outcomes (e.g. Kumi-Yeboah, 2011), while others only used mixed-methods designed where academic and TLT outcomes were only accounted for in the qualitative sections. These studies equally served their intended purpose, using the robust conceptual literature on transformative learning to provide robust descriptions of terms, but on the whole fell short of the rigor required for most

analyses.

5.1 A Brief Note About Shaver (2021)

Before describing the results taken from these studies in all tiers of analysis, there is one particular study that needs to be addressed: Shaver (2021).

As is typical for meta-analyses, the vast majority of studies were using standardized effect sizes regarded small or moderate at best. A total of seventy-eight percent of included studies with standardizable outputs had the equivalent of a Cohen's d below 1, and fifty percent below 0.5. These would be widely considered healthy and acceptable numbers. Even the studies that slightly pushed this boundary - with the equivalent of Cohen's d between one and four - had their larger impact explained by the author as an issue of sample size or sampling.

And then there's Shaver (2021), where after a few dozen attempts of my own calculations, I continued to find an effect size of $d = 17.96$ with no sensible explanation.

Conceptually, Shaver's study was one of the best for inclusion in this analysis. It discussed how project-based learning that focuses on student voice impacted their experience and retention in a given school. For this meta-analysis, I specifically referred to Shaver's numbers on dropouts, determining that schools whose education was based on this TLT-PBL model of education had a significantly higher retention rate of students between years. It was clearly structured around TLT, had identified a school-wide initiative, and had a clear academic achievement outcome in retention.

But that said, I couldn't in good conscience include an effect size that was so clearly an outlier in analysis. Even if this value is legitimate, it would skew any calculation it came into contact with, and I'm more prone to thinking of it as something to do with data error, be it mine or Shaver's.

For the primary bulk of this analysis, Shaver's study is excluded from the tiers

that it would normally qualify for (2A, 3-A, and 4-A2). However, for the sake of transparency to the process offered in Chapter 4, I have included an additional section below that details of what a few specific analyses would be like if included and its greater impact on my research. See Section 5.6.1 for this exploration.

5.2 The Biggest Takeaway

Conceptual and qualitative interpretations are not left wanting. Beyond any other coming analysis, the studies revealed a peculiar avail for transformative learning as a whole, and one to brag about. Of all studies that I found, not a single one demonstrated a negative impact of TLT interventions on student outcomes. While the nature of this positive influence naturally varies, the pattern is the same. TLT intervention with academic test scores, qualitative survey of learner's impression on education, use of faculty approval of student retention in a transformative curriculum, general academic success, content-specific knowledge gained: all positive outcomes, without a single other outcome or trend.

The categories of effect sizes and sample sizes at times make the impact of these outcomes difficult to pinpoint, but a complete lack of negative results in manuscripts that are less incentivized to be limited to these than standard publications is a strong selling point for the TLT domain.

5.3 Quantitative Results by Relevant Research Variable

If you are reading this chapter for the quick & easy conclusions typically found with qualitative review of the included studies, statistical rigor, traditional significance values of p less than .05, and rejecting null hypotheses, I can provide those

results to you right away. None of the results reach a widely accepted p-value of p ¡ 0.5, and thus are non-significant.

Thus, for those of you who want the quick conclusion, it would be easier to go on record as saying that none of the analyses attempted for this study found statistically significant results. This means that the year of publication, institution type, intervention type, transformative scope, inter/intra nature of the study, or focus of transformative criteria did not have significant relationship with observed outcomes. If that's what you came for, you may depart now.

However, if you acknowledge that this result was highly likely given the limitations of the data and that these conventional metrics aren't particularly meaningful and instead want to follow the qualitative implications, the following sub-sections will go through each of the research questions and the details of the found results.

The following report is organized into 3 sections, all of which have multiple sub-sections. The first broad section will cover group & descriptive statistics for each of the resulting datasets, beginning with the largest sets with the most flexible inclusion criteria (2A, 2B) in the main sections and followed by the sub-groups with stricter inclusion criteria in the sub-sections. The second broad section is primarily organized by the relevant variable & guiding question of interest - year of publication, intervention type, and so on. In this section, the datasets with the largest sample size and widest exclusion criteria are given first, followed by the smaller subsets with stricter inclusion criteria. In each case, the datasets and analysis included in these sections are comprehensive of the studies found; that is, every study included in the descriptives of the first section are used in the analysis of the second. This separation of sections is due to a single set of descriptives being used in multiple analyses; cross-reference each group and subgroup by code to compare a specific analysis with its descriptives.

If a section or sub-section does not have results displayed for a particular variable

or research question, this means that there was not enough recorded differences within the sub-set of data to allow for a response for that specific construct. For example, group 4-B1 (which includes studies that offered standardizable outputs where the outcome variable involved changes to TLT and primarily used the criterion of critical reflection) appears in the analysis of institution type and intervention type, since of the five studies contained in this group, there were two studies that fit into one category and three into another, allowing for a point of comparison. However, 4-B1 does not appear in analysis of the year of publication, because of the five studies, only one is in a different category than the other four.

As an extension of the above statement, this means that groups 2C, 2D, 4-A1, 4-A2, 3%A, 4%A1, and 4%A2 do not appear anywhere in the second broad section.

After these first two sections will be two smaller ones of specific investigations: one summarizing the different results from removing an outlier study, and the second a set of analyses comparing two subgroups to each other.

5.4 Group & Descriptive Statistics for all Quantitative Datasets

The sample size for the entire study, with the outlier excluded, was (n = 43); however, this number includes all studies found, which is split into 2A (n = 17), 2B (n = 11), 2C (n = 5), and 2D (n = 10). As described in Section 4.1, these groups were separated by the comparability of their outputs, and further into sub-groups based on nominal characteristics. Of these, the two most pertinent to describe are groups 2A and 2B; these are the groups whose statistical output and outcomes were internally comparable.

2A refers to all studies whose outputs were statistically standardizable, and thus comparable. These values were standardized into a Cohen's d effect size[1], which resulted in $d_{mean} = 0.599$, $SE_{mean} = .21$, $SD = .87$. 2B refers to studies whose outputs were given in percentages, but did not have enough information to be statistically standardizable, and were left as percentage values ($M = 74.65$, $SE_{mean} = 6.9$, $SD = 22.88$). The descriptives for the other sub-groups are provided in their respective tables.

The following sections and sub-sections sequentially list each of the groups used for analysis with their descriptive statistics:

[1]Cohen's d was chosen as the "baseline" value for converting standardizable outputs because it was the most common output in the 2A studies, leading to fewer needs for conversion. Other studies includes outputs of correlation coefficients, chi square, cognitive mapping, and eta squared.

5.4.1 2A (Standardized Outputs, All)

Table 5.1

Descriptive Statistics for all studies with standardized outputs

	N	Mean	Median	S.E. Mean	Std Dev	Variance	Minimum	Maximum
Output	17	0.599	.81	.21	.87	.76	.0208	3.8428

5.4.1.1 3-A (Standardized Outputs, Outcome)

Table 5.2

Descriptive Statistics for Studies with Standardized Outputs of Academic Outcomes

	N	Mean	Median	S.E. Mean	Std Dev	Variance	Minimum	Maximum
Output	5	0.617	.51	.37	.37	.1369	.02083	.91437

5.4.1.2 3-B (Standardized Outputs, TLT Growth)

Table 5.3

Descriptive Statistics for Studies with Standardized Outputs of TLT skills

	N	Mean	Median	S.E. Mean	Std Dev	Variance	Minimum	Maximum
Output	10	.708	1.03	.34	1.08	1.17	.0814	3.8428

5.4.1.3 4-A1 (Standardized Outputs, Academic Outcome, Subject-Specific)

Table 5.4

Descriptive Statistics for Studies with Standardized Outputs of Academic Outcomes, Subject-Specific

	N	Mean	Median	S.E. Mean	Std Dev	Variance	Minimum	Maximum
Output	2	.13	.133	.11	.16	.03	.02083	.24584

5.4.1.4 4-A2 (Standardized Outputs, Academic Outcome, General Performance)

Table 5.5

Descriptive Statistics for Studies with Standardized Outputs of Academic Outcomes, General Performance

	N	Mean	Median	S.E. Mean	Std Dev	Variance	Minimum	Maximum
Output	2	.69	.69	.10	.61749	.3812	.61749	.76019

5.4.1.5 4-B1 (Standardized Outputs, TLT Growth, Critical Reflection)

Table 5.6

Descriptive Statistics for Studies with Standardized Outputs of TLT Skills, Critical Reflection

	N	Mean	Median	S.E. Mean	Std Dev	Variance	Minimum	Maximum
Output	5	1.60	1.002	.58	1.31	1.71	.5993	3.8428

5.4.1.6 4-B2 (Standardized Outputs, TLT Growth, No Specified Criteria)

Table 5.7

Descriptive Statistics for Studies with Standardized Outputs of TLT Skills, without Specified Criteria

	N	Mean	Median	S.E. Mean	Std Dev	Variance	Minimum	Maximum
Output	5	.45	.564	.14	.30	.09	.0814	.8170

5.4.2 2B (%-based outputs, All)

Table 5.8

Descriptive Statistics for All Studies with Percentage-Outputs

	N	Mean	Median	S.E. Mean	Std Dev	Variance	Minimum	Maximum
Output	11	74.65	80	6.9	22.88	523.30	22	98

5.4.2.1 3%A %-based outputs, Academic Outcome

Table 5.9

Descriptive Statistics for Percentage-Based Studies with an Academic Outcome

	N	Mean	Median	S.E. Mean	Std Dev	Variance	Minimum	Maximum
Output	3	83.53	84.6	6.95	12.04	144.85	71	95

5.4.2.2 3%B %-based outputs, TLT

Table 5.10

Descriptive Statistics for Percentage-Based Studies with an Outcome of TLT Skills

	N	Mean	Median	S.E. Mean	Std Dev	Variance	Minimum	Maximum
Output	7	70.07	78	10.39	27.48	755.2	22	98

5.4.2.3 4%A1 %-based outputs, Academic Outcome, Subject-Specific

This dataset did not have any statistical values taken from it, as it only contained one study.

5.4.2.4 4%A2 %-based outputs, Academic Outcome, General Performance

Table 5.11

Descriptive Statistics for Percentage-Based Studies with Outcome of Academic Outcomes, General Performance

	N	Mean	Median	S.E. Mean	Std Dev	Variance	Minimum	Maximum
Output	2	89.8	89.8	5.2	7.35	54.08	85	95

5.4.2.5 4%B1 %-based outputs, TLT, Critical Reflection

Table 5.12

Descriptive Statistics for Percentage-Based Studies with an Outcome of TLT Skills, Critical Reflection

	N	Mean	Median	S.E. Mean	Std Dev	Variance	Minimum	Maximum
Output	4	75.38	80.5	11.56	23.11	534.23	43	98

5.4.2.6 4%B2 %-based outputs, TLT, Individual Experience

Table 5.13

Descriptive Statistics for Percentage-Based Studies with an Outcome of TLT Skill, Individual Experience

	N	Mean	Median	S.E. Mean	Std Dev	Variance	Minimum	Maximum
Output	3	81.67	78	5.24	9.07	82.33	75	92

5.4.2.7 4%B3 %-based outputs, TLT, No Criteria Focus

This dataset did not have any statistical values taken from it, as it only contained one study.

5.5 ANOVA & Kruskal-Wallis Analysis Outputs

5.5.1 Year of Publication

The year of publication for each study was regarded as a major contributing factor due to the release of seminal works in transformative learning theory. Specifically, Mezirow & Marsick's original publication associated with the beginning of transformative learning theory was published in 1978, and the term "transformative learning" was established in the literature in 1991. However, in *Transformative Learning in Practice* (2009), Mezirow presented an updated and more detailed version of his theory. This variable was designed to discern if there was a shift in usefulness or efficacy of TLT interventions prior to or after this major revision.

Of the groups and sub-groups in this study, 2A, 3-B, 4-B2, and 2B contained enough studies to be suitable for analysis. Their results are presented in Table 5.14, 5.16, 5.18, and 5.20, respectively. The results of Kruskal-Wallis Tests (a non-parametric equivalent to ANOVA) are included directly after.

The results of analyses in this category were all non-significant. However, 5.18, which was specifically for studies that were assessing the development of TLT skills but did not specify focusing on any TLT criterion, is worthy of some attention. Despite the small subgroup size, this analysis gave an output of $p = .165$ from $N = 5$, $F(1,3) = 3.35$, *Between-Groups SS* $= .19$, and *Within-Groups SS* $= .17$. The output of the accompanying Kruskal-Wallis test was similarly non-significant ($p = .248$).

Table 5.14

ANOVA for 2A, Year of Publication

		Sum of Squares	**df**	**Mean Square**	***F***	***p***
Output	Between Groups	0.24	1	0.24	.3	.593
	Within Groups	11.92	15	0.79		
	Total	12.15	16			

Table 5.15

Kruskal-Wallis Test for 2A, Year of Publication

Factor	**Statistic**	**df**	***p***
Year of Pub	0.205	1	0.651

Table 5.16

ANOVA for 3-B, Year of Publication

		Sum of Squares	**df**	**Mean Square**	***F***	***p***
Output	Between Groups	.57	1	.57	.46	.516
	Within Groups	9.93	8	1.24		
	Total	10.50	9			

Table 5.17

Kruskal-Wallis Test for 3-B, Year of Publication

Factor	**Statistic**	**df**	***p***
Year of Pub	0.325	1	0.569

Table 5.18

ANOVA for 4-B2, Year of Publication

		Sum of Squares	**df**	**Mean Square**	***F***	***p***
Output	Between Groups	.19	1	.19	3.35	.165
	Within Groups	.17	3	.06		
	Total	.36	4			

Table 5.19

Kruskal-Wallis Test for 4-B2, Year of Publication

Factor	**Statistic**	**df**	***p***
Year of Pub	1.33	1	0.248

Table 5.20

ANOVA for 2B, Year of Publication

		Sum of Squares	**df**	**Mean Square**	***F***	***p***
Output	Between Groups	77.91	1	77.91	.14	.721
	Within Groups	5155.12	9	572.79		
	Total	5233.03	10			

Table 5.21

Kruskal-Wallis Test for 2B, Year of Publication

Factor	**Statistic**	**df**	***p***
Year of Pub	0.000	1	1.00

5.5.2 Institution Type

The institution type for each study was included under the possibility that the study's institution of origin had an influence on the results that it produced. Institutions with higher and higher research and technical focuses in their Carnegie classification (RUH, D/PU, etc.) may be decreasingly invested in teaching practices that involve interpersonal work or reflection, such as TLT, when compared to their Master's and Special Focus counterparts.

Of the groups and sub-groups in this study, 2A, 3-B, 4-B1, and 2B contained enough studies to be suitable for analysis. Their results are presented in Table 5.22, 5.23, 5.24, and 5.25, respectively. The Kruskal-Wallis could not be completed, as after splitting for institution type some categories only had one group.

Group 2A is the only category of the main analyses to contain a markedly significant result, (p less than .000 from $N = 18$, $F(5,12 = 61.08$, *Between-Groups SS* $= 278.85$ and *Within-Groups SS* $= 10.96$).

Although there could be some curious consideration for whether institution type was influential in decided what TLT studies had influential outcomes, there are two conceptual problems with this interpretation, which will be included in the discussion.

Table 5.22

ANOVA for 2A, Institution Type

		Sum of Squares	**df**	**Mean Square**	***F***	***p***
Output	Between Groups	1.2	4	.30	.33	.854
	Within Groups	10.96	12	.91		
	Total	12.15	16			

Table 5.23

ANOVA for 3-B, Institution Type

		Sum of Squares	**df**	**Mean Square**	***F***	***p***
Output	Between Groups	2.92	3	.97	.77	.551
	Within Groups	7.58	6	1.26		
	Total	10.50	9			

Table 5.24

ANOVA for 4-B1, Institution Type

		Sum of Squares	**df**	**Mean Square**	***F***	***p***
Output	Between Groups	.34	1	.34	.16	.718
	Within Groups	6.48	3	2.16		
	Total	6.82	4			

Table 5.25

ANOVA for 2B, Institution Type

		Sum of Squares	**df**	**Mean Square**	***F***	***p***
Output	Between Groups	2536.03	5	507.21	.94	.526
	Within Groups	2697.00	5	539.40		
	Total	5233.03	10			

Table 5.26

ANOVA for 3%B, Institution Type

		Sum of Squares	**df**	**Mean Square**	***F***	***p***
Output	Between Groups	2931.21	4	732.80	.92	.582
	Within Groups	1600.00	2	800.00		
	Total	4531.21	6			

5.5.3 Intervention Type

The intervention type for each study was included under the practical need to discern whether interventions for TLT needed to be specifically designed and implemented or whether existing programs that use TLT principles could also benefit from it. In effect, it could determine the need for a threshold to determine if future studies need to craft isolated TLT interventions or if the reliance on observational data in existing programs was adequate.

Of the groups and sub-groups in this study, 2A, 3-A, 3-B, 4-B1, and 2B contained enough studies to be suitable for analysis. Their results are presented in Table 5.27, 5.28, 5.29, 5.30, and 5.31, respectively. The Kruskal-Wallis could not be completed, as after splitting for institution type some categories only had one group.

The results of analyses in this category were all non-significant. However, 3-B, which was specifically for studies that were assessing the development of TLT skills, warrants some attention. It presented results of $p = .15$ from $N = 10$, $F(1,8) = 2.54$, *Between-Groups SS* $= 2.53$ and *Within-Groups SS* $= 7.97$.

Table 5.27

ANOVA for 2A, Intervention Type

		Sum of Squares	**df**	**Mean Square**	***F***	***p***
Output	Between Groups	.67	1	.67	.88	.364
	Within Groups	11.48	15	.77		
	Total	12.15	16			

Table 5.28

ANOVA for 3-A, Intervention Type

		Sum of Squares	**df**	**Mean Square**	***F***	***p***
Output	Between Groups	.00	1	00	.00	.973
	Within Groups	.55	3	.18		
	Total	.55	4			

Table 5.29

ANOVA for 3-B, Intervention Type

		Sum of Squares	**df**	**Mean Square**	***F***	***p***
Output	Between Groups	2.53	1	2.53	2.54	.15
	Within Groups	7.97	8	1		
	Total	10.50	9			

Table 5.30

ANOVA for 4-B1, Intervention Type

		Sum of Squares	**df**	**Mean Square**	***F***	***p***
Output	Between Groups	.28	1	.28	.13	.744
	Within Groups	6.55	3	2.18		
	Total	6.82	4			

Table 5.31

ANOVA for 2B, Intervention Type

		Sum of Squares	**df**	**Mean Square**	***F***	***p***
Output	Between Groups	204.86	1	204.86	.37	.560
	Within Groups	5028.17	9	558.69		
	Total	5233.03	10			

5.5.4 Transformation Scope

The transformation scope of each study (e.g., institution, department, classroom; see Section 3.2.1) was included to explore whether the use of TLT interventions and trainings were more or less effective based on the size or group that was being investigated. In effect, it could determine whether further investigations should prioritize adapting TLT for national interventions, school or institution-level, focus groups, and so on.

Of the groups and sub-groups in this study, 2A, 3-B, 2B, and 3%B contained enough studies to be suitable for analysis. Their results are presented in Table 5.32, 5.33, 5.34, and 5.35 respectively. The Kruskal-Wallis Tests for each ANOVA are included directly after.

The results of analyses in this category were all non-significant. 2A presented results of $p = .992$ from $N = 17$, *F(5,12)* = .09, *Between-Groups SS* = .49 and *Within-Groups SS* = 11.67; 3-B presented results of $p = .99$ from $N = 9$, *F(4,5)* = .04, *Between-Groups SS* = .3 and *Within-Groups SS* = 10.20.

Table 5.32

ANOVA for 2A, Transformative Scope

		Sum of Squares	**df**	**Mean Square**	***F***	***p***
Output	Between Groups	.49	5	.1	.09	.992
	Within Groups	11.67	11	1.06		
	Total	12.15	17			

Table 5.33

ANOVA for 3-B, Transformative Scope

		Sum of Squares	**df**	**Mean Square**	***F***	***p***
Output	Between Groups	.30	4	.08	.04	.99
	Within Groups	10.20	5	2.04		
	Total	10.50	9			

Table 5.34

ANOVA for 2B, Transformative Scope

		Sum of Squares	**df**	**Mean Square**	***F***	***p***
Output	Between Groups	1273.46	3	424.49	.75	.556
	Within Groups	3959.57	7	565.65		
	Total	5233.03	10			

Table 5.35

ANOVA for 3%B, Transformative Scope

		Sum of Squares	**df**	**Mean Square**	***F***	***p***
Output	Between Groups	1648.42	3	549.47	.57	.671
	Within Groups	2882.79	3	960.93		
	Total	4531.21	6			

5.5.5 Inter or Intra Study

Investigating the inter- or intra- nature of each study was meant to explore whether TLT could be used as a supplementary inclusion in broader studies of education or if interventions needed to focus primarily on TLT to produce noticeable results.

Of the groups and sub-groups in this study, 2A, 3-A, 3-B, 4-B1, 4-B2, 2B, and 3%B contained enough studies to be suitable for analysis. Their results are presented in Table 5.36, 5.37, 5.38, 5.39, 5.41, and 5.42 respectively. The Kruskal-Wallis Tests for each ANOVA are included directly after.

Despite including more analyses than any other sub-group, all of the analyses in this category are non-significant.

Table 5.36

ANOVA for 2A, Inter or Intra Study

		Sum of Squares	**df**	**Mean Square**	***F***	***p***
Output	Between Groups	.4	1	.4	.51	.487
	Within Groups	11.76	15	.78		
	Total	12.15	16			

Table 5.37

ANOVA for 3-A, InterIntraStudy

		Sum of Squares	**df**	**Mean Square**	***F***	***p***
Output	Between Groups	.12	1	.12	.88	.418
	Within Groups	.42	3	.14		
	Total	.42	4			

Table 5.38

ANOVA for 3-B, InterIntraStudy

		Sum of Squares	**df**	**Mean Square**	***F***	***p***
Output	Between Groups	1.35	1	1.35	1.18	.310
	Within Groups	9.16	8	1.14		
	Total	10.50	9			

Table 5.39

ANOVA for 4-B1, InterIntraStudy

		Sum of Squares	**df**	**Mean Square**	***F***	***p***
Output	Between Groups	.34	1	.34	.16	.718
	Within Groups	6.48	3	2.16		
	Total	6.82	4			

Table 5.40

ANOVA for 4-B2, InterIntraStudy

		Sum of Squares	**df**	**Mean Square**	***F***	***p***
Output	Between Groups	1.72E-006	1	1.72E-006	1.41E-005	.997
	Within Groups	.36	3	.12		
	Total	.36	4			

Table 5.41

ANOVA for 2B, InterIntraStudy

		Sum of Squares	**df**	**Mean Square**	***F***	***p***
Output	Between Groups	2129.69	3	709.90	1.6	.273
	Within Groups	3103.33	7	443.33		
	Total	5233.03	10			

Table 5.42

ANOVA for 3%B, InterIntraStudy

		Sum of Squares	**df**	**Mean Square**	***F***	***p***
Output	Between Groups	2370.21	3	790.07	1.10	.471
	Within Groups	2161.00	3	720.33		
	Total	4531.21	6			

5.6 Other Assorted Analyses

While the previous section covers the results from the main analyses originally intended in this study, there are a few additional cases that were subsequently explored after seeing these main outputs and doing deeper digging into the data itself. These more specific, ex-post-facto analyses are: a breakdown of the major outlier study found in the data (5.6.1) and using the subgroup categories that separate specific subjects or TLT criteria for comparison (5.6.2).

5.6.1 The Curious Case of Shaver (2021)

As mentioned at the beginning of the chapter, I removed one study from the bulk of my analyses because of being an unfathomable outlier. This was Shaver (2021).

Again, Shaver's study was one of the conceptually best out of the forty-four included. It had direct intervention of TLT between a control and experimental group with an academic outcome as a dependent variable. It was clearly structured around TLT, had identified a school-wide initiative, and had a clear academic achievement outcome in retention.

It is unclear at this time what the cause of this grand outlier is; it could be an error in the data presented in Shaver's table, or it could be an error of my own in interpreting these numbers. But regardless, it was prevalent enough to call into question the analysis results of 2A, 3-A, and 4-A2, which included this highly influential study.

When I first discovered this outlier, I had considered going through every analysis in these three tiers and completing them again. I did so, but will save you substantial reading time by saying that even with Shaver's study, only one analysis was statistically significant. So for posterity, these are the descriptives for 2A with Shaver's study included and the one analysis that would have been noteworthy:

Table 5.43

Descriptive Statistics for All Studies with Standardized Outputs

	N	**Mean**	**S.E. Mean**	**Std Dev**	**Variance**	**Minimum**	**Maximum**
Output	18	1.77	.97	4.13	17.05	.0208	17.9600

Table 5.44

ANOVA for 2A, Institution Type, with Shaver

		Sum of Squares	**df**	**Mean Square**	***F***	***p***
Output	Between Groups	278.85	5	55.77	61.08	.000
	Within Groups	10.96	12	.91		
	Total	289.81	17			

Even if I wanted to take Shaver's effect size at face value, the possibility of institution type being a significant factor in TLT outcomes is inhibited by a further investigation. A post-hoc test using Fisher's Least Significant Difference model suggests that although there is some difference in significance value between groups, the only comparisons that was statistically significant was when DPU institutions were compared to a different type - where Shaver sits. For the same reason as the investigation into institution types as a whole, I have data to suggest this result is skewed and inconclusive at best.

Table 5.45

Post Hoc FLSD for Institution Type

Family	**Family**	**Mean Difference**	**Std. Error**	***p***
DPU	DRU	17.21	1.05	.000
	Ind	17.56	1.10	.000
	MCU	17.37	1.35	.000
	RUH	16.86	1.02	.000
	SF4	17.34	1.35	.000
DRU	DPU	-17.21	1.05	.000
	Ind	.35	.70	.625
	MCU	.16	1.05	.880
	RUH	-.35	.56	.543
	SF4	-.22	1.10	.846
Ind	DPU	-17.56	1.10	.000
	DRU	-.35	.70	.625
	MCU	-.19	1.10	.867
	RUH	-.70	.66	.309
	SF4	-.22	1.10	.846
MCU	DPU	-17.37	1.35	.000
	DRU	-.16	1.05	.880
	Ind	.19	1.10	.867
	RUH	-.51	1.02	.626
	SF4	-.03	1.35	.943
RUH	DPU	-16.86	1.02	.000
	DRU	.35	.56	.543
	Ind	.70	.66	.309
	MCU	.51	1.02	.626
	SF4	.48	1.02	.646
SF4	DPU	-17.34	1.35	.000
	DRU	-.13	1.05	.902
	Ind	.22	1.10	.846
	MCU	.03	1.35	.983
	RUH	.-48	1.02	.646

So, in summation: I find the suggestion that institution type strongly impacted results to be highly questionable due to the influence of an incredible outlier. It is theoretically possible, and certainly worthy of further investigation. But I caution any reader who sees the eye-catching $p \leq .000$ here to avoid taking it at face value, and this is the reason I didn't include it in my primary analyses.

5.6.2 A Few InterGroup Comparisons

The final addendum to results & analysis that I want to include here is a brief exploration comparing some of the subgroups that I created for analysis. While the current breakdown of subgroups for studies mostly covers differences in statistical output, the final level 4 splits studies into group based on a category of their outputs. In doing so, it offers the opportunity for these groups to be compared to each other for possible differences.

There were two specific group comparisons that seemed appropriate to address given their relevance to the guiding questions of this investigation. The first of these was determining if there was a difference between studies that were subject-specific in nature compared to those that focused on general student achievement; the second was determining if focusing on a specific criterion of TLT made the subsequent intervention or study any more or less effective. The former was explored by comparing subgroups 4-A1 and 4-A2 (statistically standardized outputs with academic outcomes, separated by subject-specific investigations or those that studied general academic performance), and the latter by comparing subgroups 4-A1 and 4-A2 (statistically standardized outputs, based on whether they specified critical reflection as their primary component or did not define a primary component of TLT). These are shown in Table 5.47 and Table 5.49, respectively.

Table 5.46

Descriptive Statistics for 4-A1 v 4-A2

Output	**Outcome N**	**Mean**	**Std. Dev**	**Std. Error**
General	3	7.92	12.52	7.23
Subject	3	.39	.46	.27
total	6	4.16	8.93	3.65

Table 5.47

ANOVA for 4-A1 v. 4-A2, Standardizable Academic Outputs, Subject-Specific v. General

		Sum of Squares	**df**	**Mean Square**	***F***	***p***
Output	Between Groups	84.91	1	84.91	1.08	.357
	Within Groups	313.95	4	78.49		
	Total	398.86	5			

Table 5.48

Descriptive Statistics for 4-B1 v 4-B2

Output	**Outcome N**	**Mean**	**Std. Dev**	**Std. Error**
Critical Reflection	5	1.60	1.31	.58
Unspecified	5	.45	.30	.14
Total	6	1.03	1.08	.34

Table 5.49

ANOVA for 4-B1 v. 4-B2, Standardizable TLT Outputs, CR v Unspecified

		Sum of Squares	**df**	**Mean Square**	***F***	***p***
Output	Between Groups	3.31	1	3.31	3.69	.091
	Within Groups	7.19	8	.90		
	Total	10.50	9			

Although 4-A1 v. 4-A2 were non-significant with $p = .357$ from $N = 6$, $F = 1.08$, *Between-Groups SS* = 84.91 and *Within-Groups SS* = 313.95, the ANOVA for 4-B1 v. 4-B2 resulted in $p = .091$ from $N = 6$, $F = .3.69$, *Between-Groups SS* = 3.31 and *Within-Groups SS* = 7.19: among the lowest p-values for studies not impacted by the Shaver (2021) outlier.

Chapter 6

Discussion

Reiterating the point made in Section 5.2, the most impressive finding of this study came from the reported results within the studies: every single one suggested a positive outcome, trend, or pattern due to the influence of a TLT intervention. Everything from test scores to student retention was in some way improved by the inclusion of a TLT practice.

The lack of statistically significant results does not equate to a lack of important discussion points; quite the contrary. For some of the groups in our analysis, the lack of significant results might actually be supportive for the robustness of TLT. For others, the lack of ability to spot statistical differences gives us a pointed lens toward specific priorities for future investigations.

However, this study and its goals were heavily impacted by the need to change direction from its original goals due to the limited nature of the research studies. Thus, some results suggest direct inferences that were not planned for, and some of the original guided research questions were left with only limited progress.

For the sake of organization, we will start with a broad discussion of how the neutral or negative results of the analysis provide some positive direction for TLT as a discipline. After this, we will return to each of the guiding research questions presented in Section 1.3.1 to discuss what can and can't be inferred with the current state of the literature.

Although this study is now far off from its course in creating a new intervention or proposal for integrating TLT, it still has the opportunity to provide guidance for the next iteration of investigations into TLT.

6.1 Positive Interpretations from Unclear Results

It might seem that having a bunch of results that reach non-significant conclusions would lead me to having nothing in discussion to say, but that isn't actually the case. Using the section titles in Chapter 5, let's review what variables were analyzed:

- The year in which a manuscript was published
- The institution type (Carnegie classification) in which study took place
- Whether the TLT intervention was specifically designed for that study or observed from an existing program
- The scope of the transformative intervention, from the national level to small focus groups
- Whether the effectiveness of an intervention depended on it being primarily designed around TLT literature, or having intervention features sampled from TLT primarily to serve the goals of another domain.

In each of these cases, the accompanying ANOVA was meant to indicate if there were differences among average effect size c ategories and determine if any especially effective TLT components arose. For some of these, statistical nonsignificance between the groups might currently provide evidence, but the accompanying discussion could provide prospects for future TLT research.

For example: the reason why "year of publication" was included was to allow me to explore if studies that had access to the newer revisions of transformative learning

theory were advantaged or disadvantaged compared to those that used only the previous iteration. A lack of statistical significance suggests that older interventions do not have any inherent disadvantage over newer interventions and could continue to be included in analyses. While this finding is largely neutral in nature, it could also be argued to be positive, since it means future domain-wide analyses can easily rely on older materials.

The same occurs for the other four points. Saying that the institution type of the investigation was non-significant means that my results don't provide evidence for TLT interventions being more or less successful in different types of higher education institutions. TLT interventions work at small, individual scales and large institutional ones; there was no statistically significant difference to distinguish them. Literature based in other, subject-specific domains that sample from TLT still gain many of the benefits that investigations rooted in TLT history do. These findings open opportunities for future research.

With the limited amount of studies presented here, I would caution against taking any of the above interpretations at full value; they would be better off revisited with a more robust dataset. However, unless future research suggests otherwise, TLT researchers can feel free to explore TLT effects in a variety of settings. Sometimes ‘‘there isn't a difference" can be a good safety measure for future work to rely on or elaborate from.

Now, of the non-significant findings, there are still a few points worthy of discussion.

6.1.1 The Year of Publication & TLT Criterion

In Section 5.5.1, Table 5.18, group 4-B2 was presented to compare the relationship between the year of publication and the TLT criteria discussed.

As briefly mentioned in that section, I have a proposed reason for why these results

were found. The 2009 publication threshold in TLT literature represents a major revision in the theory, including the additional three revision criteria. Subgroup 4-B2 contains the studies that do not specify the TLT criteria they use, primarily in part to using many of the six. These studies that did not specify measuring a single TLT criteria were labelled as such because they referenced assessing or observing multiple to catch a larger view of the transformative process. This makes sense, as otherwise the criteria with the most research interest was critical reflection. Studies with a broader sense of TLT would make more sense to exist after the revision.

In terms of future research, this isn't so much of a boon or bane, but rather a footnote: studies prior to 2009 seemingly focus on single aspects of TLT (mostly critical thinking) far more than the newer ones. While it's inconclusive if this would make them less effective, it would be a worthwhile line of investigation: whether the more holistic rooting of studies after 2009 have some advantage over their older counterparts not because of their recency, but because of the constructs they choose to discuss.

6.1.2 Institution Type & Standardized Outcomes

In Section 5.6.1, my results suggested that the group 2A in how institution type impacted the outcome success of the TLT studies was significant, but this was only because of the influence of Shaver's outlier. In the primary analysis, which didn't include the outlier, the results were not significant.

I reiterate my points from Section 5.6.1 that this result should be read with great skepticism, for two primary reasons. The first is that a more detailed look into comparing the specific types of institutions does not reveal any clear difference between institution types when compared independently. Second, a quick glance at the data for 2A reveals a significant outlier; removing this outlier also removes the significance from this analysis.

That said, given the scrutiny I brought to bear on the outlier study (Shaver, 2021) and the fact that I couldn't find error in effect size calculation nor insufficiency in the quality of the study, I think it prudent to mention what findings we could take if we were able to trust this result.

Shaver's (2021) study focused on how a schooling program that embodied many TLT principles to enable student self-efficacy and project-based learning impacted the student experience. Of these, I chose to refer to the retention rates between years, which suggested that the program which strongly utilized these principles had a noticeably more secure retention rate than a school who did not use this program. This makes the details of Shaver's work of note: done at a DRU institution (not RUH), that relied on explanatory and sequential mixed-methods analysis, used purposeful sampling, had a dedicated intervention that was not designed for the study, had an elongated implementation time, used multiple TLT criteria, and focused on an age of transition into higher education.

My exploration is not robust enough to say which of these components were a deciding factor in the apparently strong results, but they are here as seeds for those who can pursue them.

6.1.3 Intervention Type & TLT Skills

In Section 5.5.3, Table 5.29, group 3-B was used to compare the type of intervention (designed or observed) with the outcome of developing TLT skills.

Conceptually, the justification for this result would be that TLT characteristics could foster a variety of academic outcomes regardless of whether they are found or crafted. However, specifically attempting to develop skills useful for later transformative experiences would benefit from designed interventions that name and focus on those skills in particular. As with the interpretation of Section 6.1.1, this makes sense as the additional specificity of what a particular criterion means could be better

found in a designed intervention, and thus more readily trained in those designs.

So while TLT interventions seem successful at promoting a wide variety of academic outcomes - course performance, retention, and so on - by just relying on general principles, attempting to build a skillset for an individual to improve their receptiveness to transformative skills in the nature of dialogue, critical reflection, understanding individual experiences, and so on could benefit from a more detailed understanding of these criteria. Natural, I would say, but worthy of a follow-up with more TLT-specific measures.

6.1.4 Transformation Scope & TLT Skills

In Section 5.5.4, Table 5.32, and Table 5.33, groups 2A and 3-B were used to consider scope of the intervention; for 3-B, this specifically concerned how the scope impacted the ability to impart TLT skills.

Just as how year of publication and transformative learning intervention were not significant factors, the same benefit to future transformative learning literature due to a lack of restriction also applies to transformative scope. It would suggest that TLT interventions can equally apply if done at a large, institutional level, or a small, focus group level.

Regarding 3-B; in this sub-group, more of the studies relied on smaller focus groups than any other scope of intervention (a total of five, with the remaining five coming from two institution-wide, one program-wide, one school-wide, and one course-wide). My analysis into transformative scopes was consequently defined by studies that discussed focus groups, but the lack of including larger interventions makes it unclear whether the focus groups were superior to any of the others.

6.2 Returning to the Guiding Research Questions

In Section 1.3.1 I proposed that four research questions would guide this investigation:

1. What specific student outcome measures has transformative learning theory been successful at promoting in higher education?

2. What characteristics, criteria, or elements of transformative learning theory are emphasized or utilized in these successful practices?

3. What are the characteristics, themes, and commonalities among the most successful transformative learning interventions or practices?

4. How would we form a template module or intervention for these successful practices that could be used across institutions or disciplines?

For those of you that have read the whole journey, it is probably clear by now that I don't have solid answers to any of these. These questions were formed at the start of my investigation, while studies were still being collected for data, and I had an unclear view of what the spread of dissertations would actually be like. While there were a variety of academic outcomes included in the studies I reviewed, the lack of statistical difference among intervention features makes it unclear what features of TLT have been more or less successful. Although the sources of dissertation reports were carefully detailed with what TLT criterion they referred to (one of the reasons I focused on dissertations), this information was ultimately unusable when I didn't have a clear distinction in success of their practices. And so on.

I argue that these research questions are more indicative of my overarching goal: to see if interventions, programs and pedagogy informed by transformative learning theory might be able to fill a gap in higher education, to elevate higher education's attention to reflection and personal growth. I wanted to determine what the most

successful interventions were and what components they used so that I could create a template intervention that could be to fit the needs of certain subjects or institutional contexts.

While I can't make any clear declarations like I wanted, the meta-experience of going through the research literature and seeing the gaps in information I was missing to do my investigation has given me insight on some future steps for the discipline to take to be able to achieve my previously stated goal.

These following sub-sections will be a review of these insights and recommendations relative to each of the questions.

6.2.1 Question 1: TLT Promoting Student Outcomes

The first guiding research question was trying to answer whether TLT-based interventions were more or less effective at promoting specific academic outcome measures, and if so, which ones. The purely positive outcome suggests that yes, it is, but the dominant lack of significance (or quantitative results focusing on academic outcomes, for that matter) imakes it difficult to determine what the specific factors are.

The studies included in this analysis ranged from student retention, development of transformative skills, test performance scores, entrepreneurship skills, global citizenship, and more. By saying that the ANOVA for these groups was not significant, it implies that these studies all had relatively equitable outcomes in their results.

But here's the interpretive issue with that: almost all of the studies found for this analysis did not use a control or comparison group for the impact of TLT scores. A few did (e.g., Shaver (2021)) and some used prior years for comparison, but the vast majority did not, simply reporting on the outcome of their program or intervention. Thus, saying that the ANOVA for what interventions were more or less effective can't really assess whether the interventions were effective in comparison to other

practices. Given that all of the studies presented positive results, the more likely interpretation is that they all benefitted from TLT practices, but this would either necessitate that a) future studies include an internal control group for comparison, or b) enough quantitative analysis of TLT are conducted that an approximation of standard impact could be made. Although there isn't enough of a foundation here for declaring what specific outcomes TLT is more able to support, this *does* support the idea of TLT interventions being suitable for further exploration in many disciplines. It isn't *just* good for retention, or test scores, or what have you, but can help any of these if in the correct context.

Ironically, of the forty-four studies included here, the one most apt to make statements about the effectiveness of transformative learning theory programs is probably Shaver (2021), which - if my fear of statistical outliers is unwarranted - would be a wildly impactful result.

For future investigations: the first and primary recommendation I have is to focus more heavily on what we want TLT to be capable of and begin investigating that in a more quantitative way. Comparing transformative learning skills to the academic outcomes that institutions, teachers, and employers want seems a direct route to getting TLT noticed. Can it improve grades? Can it improve retention to keep students in schools? Will it prepare learners for the careers they seek?[1] At present, the literature seems to have a focus on comparing transformative with broad, holistic skills almost by definition. This is great in its own right, but at times difficult to compare to higher education institutions that run on different numbers.

Consider this as a point of reference: one of the most widely accepted quantitative measures for assessing TLT skills and progress is the *Learning Activities Survey*,

[1]For my fellow teachers and methodologists out there, I see you raising your hand - about to claim that using older, rote-based assessments like exam grades as an outcome metric is in and of itself a questionable practice, and that the point of TLT is for providing the more holistic skills that would be used by students and wanted by employers. If this is you, I hear that, and advocate for the same. However, let's cover our bases and have *both*. If we want a template or intervention of to spread to the masses, we need evidence that it will satisfy both practical and idealistic demands.

which comes from King (1998/2009), regarded as one of the seminal authors in transformative learning literature. Of the forty-four studies I reviewed, a mere two of them made direct use of King's survey in their quantitative analysis, too few to provide evidence for my analysis.

The resources are available: academic outcome measures like test scores, course performance, graduation, and retention would all be highly valued correlates or outcomes for transformative learning, and a suitable metric for evaluating existing TLT skills already exists. Using these resources in a large scale - across a freshman cohort in classes with different teaching styles, for example - would provide a robust foundation of academic data to use in future investigations.

6.2.2 Question 2: TLT Characteristics in Successful Education Practices

In the complete opposite issue of the first question, my investigation found that virtually every included dissertation had a robust description of the TLT criteria and discussed which ones they thought most pertinent to their chosen intervention. I was strongly inclined to view this set of studiesas being a useful source of information for this reason, as they delivered on all fronts in providing the detail and construct definitions I wanted.

However, the robustness of these details stops short of proper interpretation when the studies, for as detailed as they are, either had characteristics of being mild outliers or lacked quantitative outputs that were comparable and suitable for meta-analysis.

Perhaps, in a degree of fairness and technicality, I can do case reports of individual studies that have high effect sizes. There's obviously Shaver (2021), who primarily mentioned critical reflection and dialogue, but other studies with a high standardized effect size (over $d = 0.8$) include:

- Dempsy (2017), who used assessments of teaching presence, social presence, and cognitive presence to determine if critical thinking skills were developed by a community of inquiry.

- Fullerton (2010), who investigated the successes of undergraduate student leadership program with a TLT focus of critical thinking.

- Greico (2016), who looked at the performance of US Air Force students in a physics class with a TLT focus on critical thinking.

- Henry (2014), who used TLT skills of critical thinking to assess and build cultural competence in undergraduates preparing for a study abroad program.

- Ongito (2012), who measured the successes of students using online discussion boards as a form of critical reflection and dialogue

- Wansick (2007), who investigated whether prolonged use of online learning resources throughout multiple semesters developed an array of transformative learning skills.

Critical reflection appears as a direct priority in every study except for Wansick's, which also included it as one of the many criteria covered. While this could be used to extrapolate about the usefulness of TLT's critical reflection, I would caution against that interpretation as well; out of the forty-four studies included in analysis, a mere *six* explicitly named other transformative learning aspects as their priorities, with another five specifying they were covering all of TLT, including critical reflection. This means that, with this estimate, three-fourths of the studies included specified critical thinking as at least one of their primary components of TLT in the investigation. Critical reflection gets a big showing, with some subgroups outright limited to its criteria but that's also because it seems to get the most attention in studies.

For future investigations: this is an aspect in which many of the dissertations and manuscripts that I read already provided excellent data to work with. The amount of specificity in explaining the used construct definitions for TLT was generally strong throughout. However, this same level of construct rigor needs to be present as the focus of the outcome variables change to more rigid academic ones. Alternatively, instead of spending copious time refining transformative criteria for a given intervention, focusing around terms and ideas used in measures like King's (1998/2009) could provide the same scaffolding.

6.2.3 Questions 3 & 4: Themes of Successful TLT Interventions & Making a Template or Model of TLT Interventions

Of the forty-four studies included here, eleven of them presented interventions specifically designed for transformative learning and the study in question. Given that these eleven were then further split into groups based on the kind of statistical measure and output they used, most of the groups and subgroups of analyses either didn't include a study with a designed intervention or contained so few as to not have a realistic chance of appearing in analysis.

The group with the most designed interventions was 2A, which makes sense given the emphasis on quantitative, standardizable results. Regardless of with or without the potential outlier, the results suggest that the designed nature of an intervention was not a significant factor in its output. This is fine for institutions and programs already using TLT (they by no means should be excluded), but from a research standpoint it becomes increasingly difficult to identify characteristics of interventions if interventions aren't being made.

Since existing programs are still doing well, I would propose that this next step

in research be secondary to the need for well-defined academic outcomes and use of existing TLT measures. Having a strong, measurable foundation in academic achievement outcomes connected to TLT, even if just correlational via the learning activities survey, would provide a more immediate justification for TLT-based interventions to *need* to be designed; we can focus on designing consistent feature of interventions afterward.

6.3 Limitations Beyond the Obvious

When considering the limitations and shortcomings of this investigation, the obvious can be stated right away: a lack of studies with sufficient and valid quantitative data to make a significant conclusion, a lack of support for translation of non-English documents, even the limitation of dissertation databases and recordkeeping in library sciences. However, some of the issues found as part of this process are worthy of discussion not just for this particular attempt, but for consideration in future attempts at these same goals.

Part of the cyclical issue of doing a quantitative analysis in the transformative learning domain was that the limited orientation toward quantitative results further increases the difficulty of making robust quantitative analyses. The guiding questions of this investigation was to determine characteristics, criteria, or elements of transformative learning theory that are utilized in successful interventions. In an ideal analysis, the studies included would have clear academic outcome measures of well-known or desired constructs, and a comprehensive list of the variables that they manipulated.

However, being able to do so would require a substantially wider array of studies, more rigorous use of independent samples or pre/post tests, and more extensive detail as to the successes or failures from them. Determining the success of transformative

learning interventions is difficult when only a quarter of studies make a comparison to non-transformative practices, and thus remove any point of comparison, meaning I have to rely on their reported effect sizes without knowing the method or means with which they were found..

For the biggest example of this, consider the eleven studies whose outputs were categories as a percentage of responses or evaluation (set 2B). These studies could have had their results standardized to then be translated into effect sizes, thus making them compatible with 2A and combining the two largest/most quantifiable groups into one more statistically robust group. However, doing so requires some standardizing comparison to a non-treatment group (such as a reported standard deviation or standard error). Since these studies didn't include such a comparison, they were excluded from being a part of the set with standardizable effect sizes, making set 2A approximately 60 % of the size it could have been.

A similar roadblock happened with the group labelled 2D; many of these were studies that had quantitative components, but then said that their quantitative investigations were non-significant, and therefore weren't reported.

This isn't an issue with the available data, the investigations being done, or the methods used: it has entirely to do with the information being reported and accessible for future analysis. Taking the same studies but comparing more of them in a single group could have given a more reliable output or changed the very analyses and assumptions that could have been tested.

Thus, my final recommendation for future investigations before reaching the conclusion: report quantitative findings, and report all of them. We're not here to stalwartly defend TLT; we're here to dissect its uses and present the good with the bad.

6.4 What This Means For Future Investigations

The original observation for my investigation still holds: I saw transformative learning theory as a possible solution to higher education's concerns over student outcomes, with some small but promising studies suggesting how it could be done. That remains.

In addition, I found that the murkiness of the literature was not where I thought it would be. I was expecting abstract definitions of terms like critical reflection to have some level of inconsistency between studies, making measuring the effects of TLT interventions difficult. Instead, what I found is that the robust conceptual literature of TLT has given the discipline a strong sense of consistency regarding its own definitions, terms, and methods. The dissertations and graduate theses went into enough detail that I was able to determine their understanding of transformative learning and its process with certainty, and the universal positive outcomes continues to reinforce that it could be a viable solution.

However, the issues with this meta-analysis came in the concrete. I did have some exemplary studies that could have supported my original meta-analysis plan, but the vast majority did not. In order for a study to be a strong inclusion in future-meta analyses, it would need to generally:

1. Address what criteria or steps of transformative learning have been implemented (they don't necessarily need copious details on their construct definitions).

2. Use widely accepted measures of transformative learning skills (e.g., King's survey) to assess if an inverention or institution is properly engaging students with transformative practices.

3. Define a dependent variable that is an academic outcome measure, such as a test score, course grade, or GPA. While other outcomes are certainly possible,

the need for a tightly-woven set of studies makes me partial to suggesting these specifically.

4. Adamantly include control or comparison groups that exist within the study itself, rather than assumed convenience with other courses or years.

In order for a true analysis that can sift through effect sizes and moderate to find the meaningful portions of transformative learning, we need more evidence of the concrete effects. It's been established that the constructs are solid, and my findings suggest that there's a lot of flexibility regarding where, how, and for what transformative learning can be used. But it needs to be used, measured, and recorded.

Chapter 7

Conclusion

At its outset, the purpose of this investigation was to support the last decade's call for quantitative support and practices for transformative learning (e.g., Walker 2018, Brock 2015). It sought to collect existing literature and form it into a foundation that could suggest specific practices or principles for Transformative Learning Theory in higher education settings.

The conceptual groundwork is here and has been for decades. I, probably like many of the scholars examined in this investigation, saw the great potential in TLT to inform teaching practices and wondered whether it might provide answers to the questions posed by my peers, faculty, departments, and institutions.

But my background in methodology left me wanting more. More than just a broad concept of what TLT was good for, or a theoretical understanding of why it has worked in the past or could work in the future. How would I propose it to departments, panels, institutions? I can acknowledge that there are many aspects of TLT that conventional academic achievement may not see - if tests, exams, and departmental assessments still rely on the rote banking skills of decades past - but that doesn't mean all quantitative support should be disregarded.

In this study, I brought paint instead of primer, ‘‘put the cart before the horse", or whatever other turn of phrase you want to use. I aimed to develop this template or model that institutions could use to consistently and effectively promote TLT

practices. What I neglected to realize at the outset is that the discipline simply isn't ready for that. So, instead of a curated lesson plan, I have this projection for how I, or others more equipped than I, can move forward.

All of the studies that I reviewed indicated positive effects of transformative learning interventions. They weren't always statistically significant, often held back by the same lack of datapoints as I was, but they continue to show the same theoretical promise the discipline has had for the last few decades. In addition, TLT benefits from having robust construct definitions for its criteria and terms, with existing scholars spending pages distinguishing between terms that might seem synonymous to a layreader, like critical thinking and critical reflection. There is, I would argue, a foundational understanding of what TLT is, what it is supposed to do, and what it looks like that some other pedagogical models don't have.

Moreover, the data from this meta-analysis suggests that there's a lot of flexibility in how to look at transformative influences. Large or small institutions, individual focus groups or school-wide interventions, across multiple academic subjects, and for supporting a lot of academic backgrounds. While I can't provide a concrete answer on where TLT will be most useful - that would require more of this data - I can give some encouragement to future prospectors that there is a good chance their proposal will have an impact. The issue here is not conceptual or in scope.

Rather, it is in specificity. We need studies that use TLT skill measures like King's (1998/2009). We need outcome measures of academic achievement, like Shaver (2021) with retention. We need studies beyond individual classrooms and focus groups, that are willing to look at entire classes, cohorts, or institutions. We need a quantity of numbers reported, whether glamorously significant or concerningly not, to make comparisons. We need to maintain this quality of construct definitions and intervention design.

I'd argue that the single main conclusions I can give is to echo the call for quantita-

tive support in Transformative Learning Theory, and specify what that quantitative call means. We, as educators, should already know what metrics schools and institutions want to see to validate new teaching practices, and measures for quantifying transformative learning already exist. We need to use them, and compare them to other performance scores. The tools are already available, but this meta-review suggests they aren't being used together. Let us do so, create an array of data, and see where it can go from there.

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Appendices & Data

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Group Code:				Includes:	# of Studies
1A				The entire dataset.	44
	2A			All studies that had enough data to provide a calculatable or comparable effect size for meta-analysis (included Cohen's *d*, correlation coefficients, chi-square values, and fuzzy cognitive map vertices).	18
		3-A		A subset of 2A that pertains to academic achievement (test grades, course grades, dropout rates, etc.)	6
			4-A1	A subset of 3-A where the standardizable academic achievement outcomes were regarding a specific subject (such as math or nursing).	3
			4-A2	A subset of 3-A where the standardizable academic achievement outcomes were not limited to a specific topic (such as overall GPA and dropout rate).	3
		3-B		A subset of 2A that pertains to developing TLT skills or criteria (critical reflection, individual experience, etc.).	10
			4-B1	A subset of 3-B that pertains to developing the TLT skill of critical reflection.	5
			4-B2	A subset of 3-B that contains all TLT skill studies not included in 4-B1 (that is, all those that don't focus only on critical reflection).	5
		3-C		A subset of 2A where standardizable outputs did not fit into either 3-A or 3-B. This included one study focusing on emotional-social intelligence and another on use of religious coping strategies.	2
	2B			All studies whose primary analysis came in the form of percentage totals or averages based on an intervention.	11
		3%A		A subset of 2B that pertains to academic achievement (test grades, course grades, GPA, etc.).	3
			4%A1	A subset of 3%A that pertains to academic achievement outcomes a specific subject (such as math or nursing).	1
			4%A2	A subset of 3%A where the academic achievement outcomes were not limited to a specific topic (such as overall GPA and dropout rate).	2
		3%B		A subset of 2B that pertains to developing TLT skills or criteria (critical reflection, individual experience, etc.).	7
			4%B1	A subset of 3%B that pertains to developing the TLT skill of critical reflection.	4
			4%B2	A subset of 3%B that pertains to developing the TLT skill of individual experience.	3
			4%B3	A subset of 3%B that contains all TLT skill studies not included in 4%B1 or 4%B2 (that is, all those that don't focus only on critical reflection or individual experience).	1
		3%C		A subset of 2A where the percentage outputs were not passed on assessing academic outcomes or transformative skills. The one study included investigated lifestyle choices of Fullbright scholars.	1
	2C			Studies that included quantitative analysis, but the outputs were not standardizable or comparable to sets 2A and 2B.	5
		3?A		A subset of 2C that pertains to academic achievement (test grades, course grades, dropout rates, etc.).	2
		3?B		A subset of 2C that pertains to developing TLT skills or criteria (critical reflection, individual experience, etc.).	1
		3?C		A subset of 2C where the quantitative outputs did not pertain to either academic achievement or TLT skills.	2
	2D			Mixed-method studies that included quantitative data, but only in ways that were not useful to meta-analysis (e.g., demographic data with no comparable academic outcomes). In many cases, this was because studies referenced excluding non-significant findings that would have otherwise been usable.	10

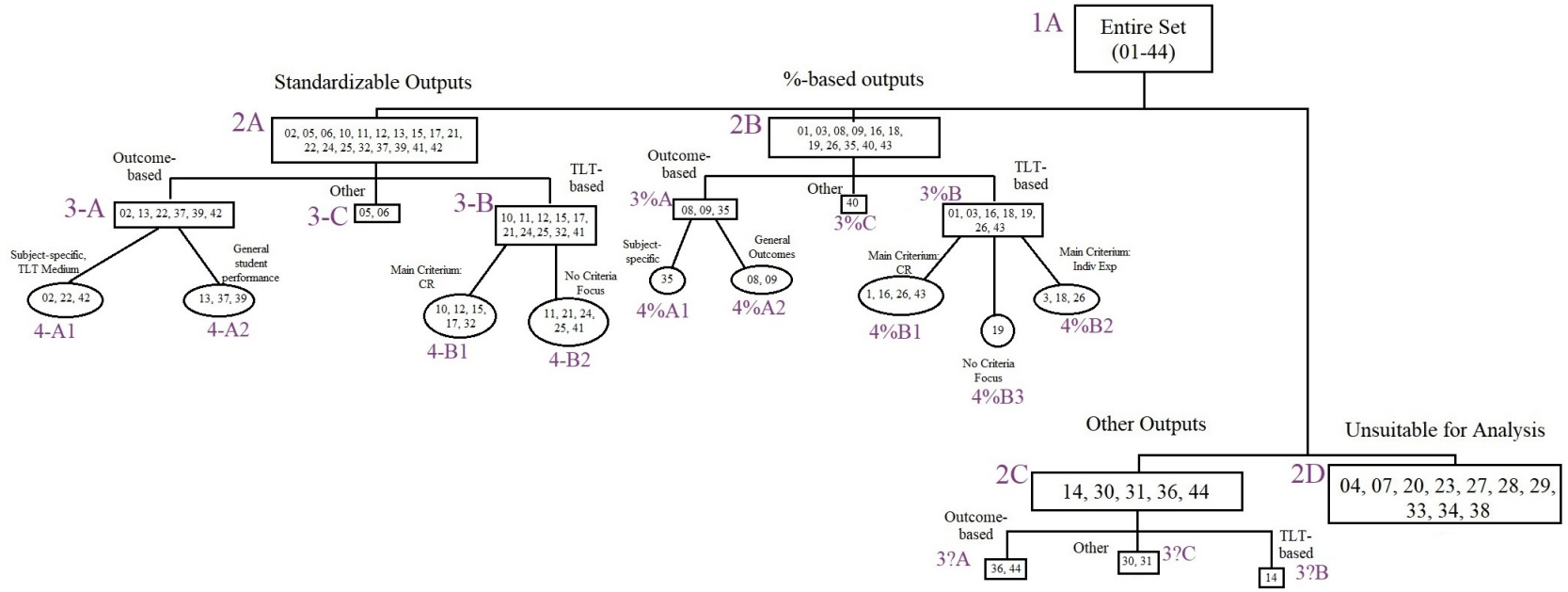
1A
Entire Set (01-44)
Standardizable Outputs
%-based outputs
2A
02, 05, 06, 10, 11, 12, 13, 15, 17, 21, 22, 24, 25, 32, 37, 39, 41, 42
2B
01, 03, 08, 09, 16, 18, 19, 26, 35, 40, 43
Outcome-based
Other
TLT-based
3-A
02, 13, 22, 37, 39, 42
3-C
05, 06
3-B
10, 11, 12, 15, 17, 21, 24, 25, 32, 41
3%A
08, 09, 35
40
3%C
3%B
01, 03, 16, 18, 19, 26, 43
Subject-specific, TLT Medium
General student performance
02, 22, 42
13, 37, 39
4-A1
4-A2
Main Criterium: CR
No Criteria Focus
10, 12, 15, 17, 32
11, 21, 24, 25, 41
4-B1
4-B2
Subject-specific
General Outcomes
35
08, 09
4%A1
4%A2
Main Criterium: CR
Main Criterium: Indiv Exp
1, 16, 26, 43
19
3, 18, 26
4%B1
4%B3
4%B2
No Criteria Focus
Other Outputs
Unsuitable for Analysis
2C
14, 30, 31, 36, 44
2D
04, 07, 20, 23, 27, 28, 29, 33, 34, 38
Outcome-based
Other
TLT-based
3?A
36, 44
30, 31
3?C
14
3?B

Table 7.1

Summary of Studies Used in Data, 1-22

Study #	Abbreviated Title	Author	Year of Pub	Used Output	Standardized Value
1	Restorative practices: Graduate students'...	Adamson	2012	CR Instructor Approval	95%
2	Transforming the white racial frame...	Bacy	2018	Posttest Improvement	d = 0.02083
3	The alchemy of change...	Baker	2012	Perspective changes	92%
4	A case study of undergraduate...	Bhalla	2019	N/A	N/A
5	Adult religous education...	Bishop	2006	TLT and coping skills	d = .4253
6	Emotional-social intelligence...	Boute	2017	TLT skills and performance	d = 0.5969
7	Faculty sensemaking and transformative...	Burns	2012	N/A	N/A
8	Transforming university non-art majors...	Chien	2018	Posttest Improvement	84.6%
9	Transformative learning and leading...	Damminger	2004	Retention	95%
10	The relationship between a community of inquiry...	Dempsey	2017	TLT and performance	d = 1.622
11	Transformation of nursing students'...	Doyle	2008	Nursing grades	d = 0.56356
12	Transformative learning through...	Duffy	2006	Posttest improvement	d = 0.59929
13	Increased student engagement with...	Ellis	2021	Freshman success	d = 0.61749
14	The impact of transformative learning...	Franz	2013	Content knowledge	N/A
15	Transformative learning in college students...	Fullerton	2010	Posttest improvement	d = 3.8428
16	Transformative teacher education...	Glisczinski	2005	Cross-sectional survey	43%
17	Meeting the demands of the 21st...	Grieco	2016	Physics grades	d = .94054
18	The long and winding road...	Grob	2021	PT score improvement	75%
19	Transformative learning and global...	Handershot	2010	Survey approval	25%
20	‘‘Becoming activated”: Transformative...	Hashimoto	2007	N/A	N/A
21	A pedagogy of hope...	Heaton	2020	degrees of centrality	d = 0.5877
22	The development and implementation of...	Henry	2014	Study abroad readiness	d = 0.9143

Table 7.2

Summary of Studies Used in Data, 23-44

Study #	Abbreviated Title	Author	Year of Pub	Used Output	Standardized Value
24	Factors that promote transformative...	Kumi-Yeboah	2012	Influential TLT factors	d = 0.0814
25	Awaken 101...	Lankenau	2012	Posttest improvement	d = 0.2
26	Applying transformative learning theory...	Lee Korns	2018	Preservice teacher performance	78%
27	Getting smart to do good...	Logan	2013	N/A	N/A
28	How supplemental instruction (SI) leaders...	Lozada	2017	N/A	N/A
29	Social networking sites in the...	Luttrell	2012	N/A	N/A
30	Transformative professional development...	Mccoy-Wilson	2019	N/A	N/A
31	Disrupting the discourse of the other...	Nangah	2015	N/A	N/A
32	Transformative learning within the online...	Ongito	2012	TLT use with performance	d = 1.002
33	It's not age, it's awareness...	Peloquin	2019	N/A	N/A
34	The effects of working with...	Pryle	2020	N/A	N/A
35	The entrepreneurship boot camp...	Redmon	2013	Post survey understanding	71%
36	Seeing and sustaining transformative learning...	Sawyer	2004	N/A	N/A
37	Impact of student voice on self-efficacy	Shaver	2021	Dropout rates	d = 17.96
38	An exploration of change, progression...	Smith	2015	N/A	N/A
39	Quality and directionality of global citizenship...	Stanlick	2015	Performance scores	d = .7601
40	Perspective transformation: Analyzing the outcomes...	Tacey	2011	Fullbright life choices	N/A
41	Transformative learning in online courses	Wansick	2007	Likhert group comparisons	d = .817
42	The relationship of transformative learning experiences...	Wilkerson	2019	Multicultural competency	d = .2458
43	A photo for change...	Younis	2021	Self-report growth	83%
44	Impacts of a short-term study abroad...	Zabarauskas	2015	Likhert survey	N/A

Dissertation & Graduate Theses Used in Analysis

Adamson, C.W. (2012) *Restorative practices: Graduate students' perspectives seen through a transformative learning lens* (Publication Number 3503001.) [Doctoral dissertation, Lesley University]. Proquest Dissertations & Theses Global.

Bacy, K.Q. (2018) *Transforming the white racial frame: mixed-methods analysis of a film intervention with midwestern college students* (Publication Number 10827570.) [Doctoral dissertation, Creighton University]. Proquest Dissertations & Theses Global.

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Bishop, D. (2006) *Adult religious education as transformative learning: the use of religious coping strategies as a response to stress* (Publication Number 32684371.) [Doctoral dissertation, University of Southern Mississippi]. Proquest Dissertations & Theses Global.

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Burns, K. A. (2012) *Faculty sensemaking and transformative learning: Working to advance community college student learning through the scholarship of teaching and learning.* (Publication Number 3548977.) [Doctoral dissertation, University of Massachusetts Boston]. Proquest Dissertations & Theses Global.

Chien, T. F. (2018) *Transforming university non-art majors' art learning perspectives by integrating informal learning strategies* (Publication Number 10809189.) [Doctoral dissertation, The University of Arizona. Proquest Dissertations & Theses Global.

Damminger, J. K. (2004) *Transformative learning and leading through a comprehensive learning community experience for undeclared freshmen* (Publication Number 3133631.) [Doctoral dissertation, Rowan University]. Proquest Dissertations & Theses Global.

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Doyle, M. O. (2008) *Transformation of nursing students' attitudes, assumptions, and beliefs on death and dying: A mixed methods study* (Publication Number 3297538.) [Doctoral dissertation, Capella University]. Proquest Dissertations & Theses Global.

Duffy, C. E. (2012) *Transformative learning through critical reflection: The relationship to emotional competence* (Publication Number 3237034.) [Doctoral dissertation, The George Washington University]. Proquest Dissertations & Theses Global.

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Franz, R. (2013) *The impact of transformative learning at a regional university.* (Publication Number 3565617) [Doctoral dissertation, Walden University]. Proquest Dissertations & Theses Global.

Fullerton, J. R. (2010) *Transformative learning in college students: A mixed methods study.* (Publication Number 3398454) [Doctoral dissertation, University of Nebraska]. Proquest Dissertations & Theses Global.

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Grieco, I. N. (2016) *Meeting the demands of the 21st century workplace: Effects on critical thinking instruction and the application of critical thought* . (Publication Number 10103879) [Doctoral dissertation, Northcentral university]. Proquest Dissertations & Theses Global.

Grob, K. L. (2021) *The long and winding road: An explanatory mixed methods study of medical students' transformative learning and professional identity development during an innovative educator training course.* (Publication Number 28414668) [Doctoral dissertation, University of Michigan-Flint]. Proquest Dissertations & Theses Global.

Handershot, K. (2010) *Transformative learning and global citizen identity development in undergraduates: A case study* (Publication Number 3389956.) [Doctoral dissertation, Lehigh University]. Proquest Dissertations & Theses Global.

Hashimoto, Y. (2007) *"Becoming activated": Transformative learning and education for social change through an undergraduate course* (ISBN: 978-0-494-39430-4.) [Doctoral dissertation, University of Toranto]. Proquest Dissertations & Theses Global.

Heaton, M. G. (2020) *A pedagogy of hope: Levers of change in transformative place-based learning systems.* (Publication Number 28004712) [Doctoral dissertation, Antioch University]. Proquest Dissertations & Theses Global.

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Kumi-Yeboah, A. (2011) *Factors that promote transformative learning experiences of international graduate-level learners* (Publication Number 3505124.) [Doctoral dissertation, University of South Florida]. Proquest Dissertations & Theses Global.

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Lee Korns, J. M. (2018) *Applying transformative learning theory to understand preservice teachers' learning experiences about formative assessment strategies.* (Publication Number 13806754.) [Doctoral dissertation, Northeastern University]. Proquest Dissertations & Theses Global.

Logan, R. (2013) *Getting smart to do good: Transformative learning experiences of expeditionary learning graduates.* (Publication Number 3568468.) [Doctoral dissertation, Prescott College]. Proquest Dissertations & Theses Global.

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Ongito, O. J. (2012) *Transformative learning within the online environment: The impact of learners' gender, epistemological and self-efficacy beliefs on generation of knowledge in online discussion forums.* (Publication Number 3540148) [Doctoral dissertation, The Patton College of Education of Ohio University]. Proquest Dissertations & Theses Global.

Peloquin, D. (2019) *It's not age, it's awareness: the impact of a social justice curriculum on adult learners in higher education.* (Publication Number 13809691) [Doctoral dissertation, Northeastern University]. Proquest Dissertations & Theses Global.

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Redmon, S. T. (2013) *The entrepreneurship boot camp for veterans' families program: Transformative learning for discontinuous life transition.* (Publication Number 3599131.) [Doctoral dissertation, Fielding Graduate University]. Proquest Dissertations & Theses Global.

Sawyer, L. L. (2004) *Seeding and sustaining transformative learning, development, and spiritual growth in higher education: A case study* (Publication Number 3155999.) [Doctoral dissertation, Union Institute and University]. Proquest Dissertations & Theses Global.

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