FIRST STEPS TOWARD A "MEETING OF THE MINDS" FOR THE BIDIRECTIONAL TRANSLATION BETWEEN THEORY AND PRACTICE: A DETAILED ANALYSIS OF CONSIDERATIONS FOR A NEW FRAMEWORK FOR INCORPORATING INTO PRACTICE NEEDED LEARNING THEORIES FOR CHANGING TIMES USING "COGNITIVE FLEXIBILITY THEORY" AS A PARADIGM EXAMPLE

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ABSTRACT

As the 21st century unfolds, the world has become increasingly fast-paced, interconnected and unpredictable compared to previous generations (McChrystal, et al., 2015). As a result, education researchers and practitioners must be prepared for the challenge of helping students better apply their knowledge to respond to the complex and novel problems that they are increasingly likely to encounter on a regular basis – not only to make them employable in the rapidly-evolving global job market (World Economic Forum, 2016), but also for their ability to navigate their everyday lives and responsibilities (e.g., weighing ever-changing degrees of risk involving COVID-19 variants). But even as education policymakers have explicitly noted the need for students to develop such 21st century skills for the sake of both their individual well-being and the flourishing of human society as a whole (Michigan Department of Education, 2019), K-12 schools in the United States continue to implement curricula and standardized assessments that tend to reinforce maladaptive "habits of mind", including an oversimplified understanding of "ill-structured" topics and a desire to identify "essential" information to apply across all situations even when such information does not exist (Spiro & DeSchryver, 2009). Beyond this, even though learning theories have been promoted within academia that are aimed at instilling a cognitive mindset that *embraces* complexity and the situationally adaptive assemblage of one's knowledge – for instance, Cognitive Flexibility Theory (CFT; e.g., Spiro, et al., 1987) and corresponding forms of Web-based learning, such as LICRA (Learner-Initiated, Complex, Reciprocally Adaptive) Web searching (DeSchryver & Spiro, 2008) – difficulties involving translation of research into practice have frequently hindered efforts to integrate such cognitive frameworks within ecologically valid learning environments. Partly because of such issues of translation, to date, no curricular strategies have been formally developed by education researchers to adequately address the need to help students develop adaptive learning mindsets in a manner that embodies better understanding of how the thoughts of researchers/theorists and teachers/practitioners need to mutually move toward each other to address that need (i.e., the integrative "meeting of the minds" in the title). And on a broader scale, efforts have not yet been undertaken to formally plan or empirically test what might be entailed when trying to develop paradigms or frameworks aimed at forming a bidirectional translation process between researchers and teachers, in order to more meaningfully bring together learning theories designed to address changing times and teachers' navigation of their pedagogical "realities" in relation to introducing students to such substantial change.

As a preliminary step in trying to address these issues, this dissertation sought to begin exploring what a new theoretical paradigm of "translation" might entail, one that *in principle* calls for a multi-stage process of using collective understanding formed between theorists and practitioners involved in joint collaborative efforts (i.e., communities of practice) to inform modification of academic theories and teachers' notion of practice as needed for more meaningful translation into practice. For such a purpose,

a detailed examination of extensive planning discussions was undertaken to begin examining what might go into the process of teachers and researchers coming together to develop mutual understanding between each other for the purpose of ultimately translating modified theory into practice, particularly by documenting the first iteration (planning) of a multi-stage collaboration between two education researchers specializing in CFT/LICRA and one high school U.S. History teacher. More specifically, efforts were made to chronicle their initial six planning discussions over Zoom, which involved the collaborating parties learning about each other's perspectives, discussing constraints reported as being inherent to the teacher's professional "reality", and brainstorming how CFT as a cognitive framework (including use of LICRA for Web-based learning activities) might be integrated by the teacher into his classroom instruction alongside his preexisting pedagogy. The early stages of design research methodology were utilized to modify topics of discussion covered as they evolved in both structure and focus, in order to account for and adaptively respond to notable concerns and insights *as they were shared* by the collaborators. In a manner involving multi-stage documentation of their interactions for the purpose of informing future systematic and generalizable research in the teacher's classroom setting, data analysis was aimed at identifying noteworthy points of alignment between the teacher and researchers' perspectives, including their respective opinions about how the collaboration itself unfolded and key considerations raised for the teacher's potential implementation of CFT/LICRA within his classroom setting in the future. Finally, emphasis was placed on balancing theory-informed and grounded theming (on a content-based and metacognitive level) for all data obtained across the planning discussions, in order to richly capture the "realities" shared by the collaborators, as well as any "meanings" underpinning those "realities" that appeared to shape their interactions across the collaboration (Saldaña, 2016).

By examining the teacher and researchers' interactions over their discussions in such a manner, this study aims to inform the development of a framework – one that, like CFT itself, is intended to be flexible, open, adaptive and multi-perspectival in nature – to guide future research on the bidirectional translation process (for example, exploring the potential merits of integrating CFT/LICRA into educational discourse streams seeking to improve existing teaching practices). In particular, it is hoped that the discussions documented for this study can offer valuable insights regarding how such a cognitive theory of learning might help K-12 students more deeply learn and adaptively apply knowledge from ill-structured academic subjects like U.S. History. More broadly, by ascertaining the teacher and researchers' reciprocal influence on each other while constructing meaning within their shared collaborative space, it is anticipated that this communicative framework in development will facilitate future efforts to enact education reform through use of communities of practice similarly designed to systematically bring scholars and practitioners together to help students navigate an ever-changing world.

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INTRODUCTION

For over 100 years, scholars advocating for education reform have grappled with the need to meaningfully translate promising theory into useful practice, with scholars as far back as Dewey acknowledging the existence of "two controlling purposes" when supporting the work of teachers (Dewey, 1904, p. 9). In particular, even as they have noted the importance of finding opportunities to evaluate the merits of different ideas and theories from academia in more ecologically valid contexts (i.e., via research designed to examine their potential effectiveness beyond artificially controlled or laboratory settings), they have also recognized that such efforts risk being hollow or inadequate if they fail to also equip teachers with the tools and strategies needed to successfully apply them. It can be argued that such a consideration, long regarded as defining the "limiting terms within which all practice work falls" (para. 3), likely plays a major role in why it can often take many years for empirical research to be "incorporated into routine practice" (Curran, et al., 2011, p. 174; see also Graham, et al., 2006; Zidarov, et al., 2013). But beyond concerns raised about *how long* it takes for such a transition to occur, institutions adhering to "traditional" approaches to teaching have also been criticized for their inability to provide adequate opportunities for researchers and practitioners to engage in the "conversations for internalization and deep understanding" needed for proper translation of scholastic knowledge (Richardson, 1997, p. 3).

Indeed, when critically examining how translation has been used to inform and train teachers both formally and informally, troubling and far-reaching trends are noticeable through prior documentation of how theories from academia have been integrated within authentic school settings, such as Howard Gardner's concerns about how practitioners have often misconstrued his multiple intelligences theory as an endorsement to prescribe a "one size fits all" learning style to each student across all learning activities regardless of the context or situation at hand (Northern Illinois University Center for Innovative Teaching and Learning, 2020). Such missteps call to mind Dewey's frustration with "curriculum-centered" schools' dismissal of the lived experiences and interests of children (Constitutional Rights Foundation, 2008), in the sense that one cannot blindly rely on any single "direct procedure" for inserting learning theories and other academic ideas into all classrooms in a uniform manner (Richardson, 1997, p. 3). Rather, there must be an underlying logic to *how* they are translated for eventual use by each teacher.

On the one hand, scholars and practitioners alike must proactively account for the "myriad of individual and contextual diversities" found in each classroom setting when brainstorming how theories and ideas from academia might be translated into it, for it is impossible to separate attending to that classroom's needs from having to navigate the "social milieu" inherently brought into that learning space by the unique teacher(s), students and other individuals interacting with it (Richardson, 1997, p. 3). But beyond such a pragmatic rationale, Schwimmer (2017) argues that if scholars envision theories and ideas from academia as a "detached…commodity" that can be "mobilized by the researcher or teacher at any

time" without any sort of situational variability, they run the risk of inappropriately overlooking how language *in principle* "endlessly translates and produces new meanings" whenever knowledge is shared, depending on who is adapting it for their unique context and under what circumstances (p. 51). And thus, they risk unduly minimizing teachers' inherent responsibility as "knowledge users" whenever academic theories or ideas are to be applied to facilitate and support their students' learning (p. 51). In other words, Schwimmer envisions the translation of theory into practice as a "fundamentally ethical" process that requires the active involvement of all stakeholders in education, and that such efforts must duly account for the essential and ongoing role that teachers themselves play in enacting education reform (p. 57).

With this in mind, it is important to explicitly note from the beginning that for the purposes of this dissertation, there was a strong desire to ethically and proactively reevaluate how the notion of "translation" that might be utilized by those interacting within the collaborative space being examined. For example, from early on in the collaboration, the participating scholars discussed their shared desire to avoid (or minimize as much as possible) any risk of inappropriately consigning practitioners (i.e., the teacher participating in the study) and their professional knowledge – even inadvertently – into a passive or subordinate role during any stage of the collaboration that was unfolding. In line with this concern, it must be emphasized that whenever the collaborators participating in this study explored the notion of "translating theory into practice", it was presumed that such a translation of a theory (or theories) would have *already undergone modification through the development of mutual understanding between the theorist(s) and practitioner(s) interacting within the collaborative space being examined*. Even further, this dissertation will also call for academia more broadly to undergo a theoretical paradigm shift from how it has traditionally defined "translation", namely by proposing a new *three-step "translation" model*:

1. Presentation of a given learning theory to all parties interacting within a given collaborative space
2. Modification of said theory *in direct response* to the parties' development of practitioner-theorist understanding, including what emerges across their interactions during collaborative efforts
3. Translation or adaptation of the modified theory into practice (i.e., for implementation within whatever learning context is being focused on during the parties' collaborative efforts)

In other words, the form of "translation" being advocated for during this dissertation explicitly calls for a step away from one-way influence (i.e., from scholars to practitioners), in favor of duly accounting for the knowledge that can be derived from practitioner input (e.g., teacher voice) when considering *how* theories formulated within academia might be more meaningfully implemented within authentic learning contexts. [Note: Efforts will be made throughout this manuscript as needed to delineate how this study's notion of "translation" is different from the use of "translation" that has been utilized in prior research that is cited.]

But this begs the question: what does it mean to develop such mutual understanding between education researchers and practitioners in ways that can foster more ethical translation of academic knowledge? To address this, when considering the "source" (i.e., deliverer) and "target" (i.e., recipient) of shared knowledge, Schwimmer acknowledges the existence of "in-between spaces of constant indecisiveness" that can often hinder understanding between them (p. 54). Indeed, a variety of factors can contribute to such "indecisiveness" when researchers and practitioners interact with each other (often without the collaborating parties involved even realizing it), including differences in prior knowledge, recent incidents possibly affecting a given collaborator's "state of mind", or even how a seminal text is being "introduced" (p. 54). On a localized scale, this suggests that proactive steps must be taken to provide any given teacher with the tools and support necessary for them to translate theory into practice in "a responsive and responsible way", as opposed to assuming that they will automatically know how to "generate the expected effects" (p. 57). But on a broader scale, as noted by Doll Jr. (1983), when leaders in education have been criticized for their inability to enact "major school changes", it is often due to their antiquated reliance on "hierarchical" structures that unfairly consign teachers to implement "plans and goals devised by others", in a manner that often leaves them "isolated from the change process" (p. 172). With this in mind, multiple scholars have argued for the need to "redefine" the role of teachers both within authentic school settings and academia itself – namely, from designating them as passive deliverers of a "pre-constructed curriculum" to providing them the sense of agency that can empower them to serve as "change agents in their buildings" and beyond (p. 172; Englert, et al., 1998, pp. 261, 273). Collectively, these sentiments call for a fairer and more "practical focus" that allows all involved in education, especially teachers, their chance to contribute to collective efforts to identify "alternative" approaches to learning that can help bring forth the "new era, that 'true kingdom of God'" that Dewey and other progressive educators have long strove to make a reality (Doll Jr., 1983, p. 173).

And indeed, in the 21st century, there appears to be a greater sense of societal urgency than ever to reevaluate what it means to properly educate students – as well as how different parties in education, scholars and teachers included, might contribute to those efforts. In particular, many have pointed out that the world has become significantly more interconnected, faster paced, and less predictable compared to previous generations (Mansilla & Jackson, 2013), resulting in the emerging argument that humanity needs to radically shift its mentality when navigating complexity and rapid changes in their daily lives (McChrystal, et al., 2015). In line with this, when the World Economic Forum (2016) considered the "future of jobs" and core skills that would be valued across all industries during the Fourth Industrial Revolution (i.e., when looking ahead to 2020), "complex problem solving" was identified as the skill that would be most needed by workers in order to attain professional success within the future global workforce (Gray, 2016). Because of this, when reevaluating the purpose of education and what could be

done to empower students to better navigate the complexity that they might encounter within their surroundings (Grant, 2012), emphasis has been increasingly placed on the need for leaders in education to develop school environments that are designed to prioritize "richer learning" in students (Rotherham & Willingham, 2010, p. 18); but such a shift in priorities has not come easily up until now. For example, multiple frameworks have cited skills like "adaptability" (e.g., Partnership for 21st Century Skills Framework (P21); Metiri/NCREL's EnGague) or "critical thinking" (e.g., ISTE's ICT Skills; College Work and Readiness Assessment (CWRA)) as critical 21st century skills (Dede, 2010), implying that educators need to focus more on helping students learn how to situationally navigate complex problems that cannot be solved through mere fact retrieval or completion of routine tasks (Voogt & Roblin, 2010). However, as pointed out by Dede (2010), teachers are still being asked to administer assessments and tests that are woefully oversimplified due to their inability to monitor student growth in either their "expert decision making when no standard approach seems applicable" or their ability to "transfer their understandings to real world situations" (p. 3). And even when reforms have been proposed, concerns have been raised about how such undertakings tend to leave "little trace on the learning experiences of students", often engendering bitter feelings between those involved in such efforts (Shapiro, 2009, p. 6). Collectively, such sentiments hammer home the urgent need for scholars and practitioners to appreciate the challenge likely to be involved in better fitting curricula to meet the present and future needs of students, as well as the risk of schools becoming increasingly outdated over time if they fail to do so.

For instance, one of the key factors fueling modern society's growing connectedness, speed and complexity is the exponential growth and presence of computing power and resources as a staple of everyday life, including how people seek and obtain information (Talin, 2020). More specifically, the World Wide Web provides users easy and near-instantaneous access to an immeasurable amount of the world's collective knowledge (Coiro, et al., 2008; Castek, et al., 2015), while also utilizing a nonlinear hypertext that offers an endless array of options for exploring and understanding any given topic more deeply than ever before (Spiro, et al., 1992). If instructional strategies are able to be proactively designed for teachers to capitalize on such unique features, then it could be argued that integration of the Web into their pedagogical practices could facilitate the creation of hands-on opportunities for their students to develop their ability to navigate the world in more adaptive and complex ways. However, even as the Web has rapidly emerged as Americans' primary source of information compared to traditional media (including for news; Shearer, 2021), significant debate has persisted over how classroom settings can use the Web in ways that promote students' learning rather than hindering it (Olson, 2015). For instance, Ramírez-Orellana, et al. (2012) reported that although the vast majority of secondary teachers (87.2%, n = 1721) dispute the notion that "the Internet has little to offer teaching" (p. 150), their opinions remain fairly divided over whether the Internet is essential for the teacher-learning process (52.6% agreeing with

the notion). In turn, those teachers cited lack of meaningful training or experience as two of their primary reasons (70.4% and 66.5%, respectively) for not integrating the Internet into their classroom instruction, particularly for teaching non-STEM subjects like languages, social sciences and humanities (e.g., history). Thus, even as scholars (particularly those focused on history education) have emphasized the importance of teaching students how to thoughtfully engage with different perspectives that they might encounter (Barton & McCully, 2007), concerns persist (including from teachers themselves) over how to equip students with the skills necessary to critically evaluate the variety of sources on the Web with that consideration in mind, particularly since different levels of credibility between sources can exist between websites and even "on the same screen page" (Knobloch-Westerwick, Mothes, et al., 2015, p. 493).

Such concerns appear to be greatly warranted, for even as students have begun to rely more and more on digital content for information access (e.g., getting news, understanding societal issues), findings from recent scholarship suggest that they are often struggling to meaningfully evaluate what they find online. For instance, when Breakstone, et al. (2021) assigned six constructed-response tasks to high school students (n = 3,446), the vast majority of those assessed (i.e., 68.7% or more across all tasks) were classified as "beginning" online learners (i.e., demonstrating a lack of mastery through their use of "incorrect or irrelevant strategies"; p. 509) across several dimensions of evaluating Web-based information, including identifying criteria for whether or not something qualifies as "good evidence", determining the trustworthiness of websites or social media posts (e.g., being cognizant of their use of top-level domains like ".org", checking the sources of embedded videos), comparing different websites to determine the best or most reliable source of information, and distinguishing advertisements from news stories. Even more alarmingly, students identified as "beginning" learners were also found to be highly susceptible to disinformation across a litany of relevant societal issues, from election voter fraud to climate change to gun control – leading to concerns about whether the Web is more likely to develop or stunt their ability to situationally adapt and think critically in response to novel problems or complex issues that they face. To be fair, learners themselves have acknowledged the gravity of this issue through self-reporting their own dissatisfaction when using the Web (Kobayashi & Takeda, 2000), possibly due to having difficulty managing the unpredictability inherently involved with finding desired information online and navigating the "underlying technology that supports interaction with the Web" (Palanque & Paternò, 1998, p. 261). And as pointed out by Spiro (2006e), the promotion of websites like Wikipedia as "*central repositories* of authoritative knowledge" can also play a role in enabling users' tendency to rely on closed information searches aimed at obtaining a single "right" answer or solution in a superficial or surface-level manner, even when such a pursuit is reductive or inappropriate for the topic at hand (p. 1).

Nevertheless, whether it is due to emphasis being placed on helping students attain "some minimal criteria for task completion" or test performance rather than deep understanding (p. 2), the Web's

existing layout, or other factors potentially impacting schools on a systemic or local level, the current U.S. educational climate appears to be detrimental for students' development of skills or a learning mindset necessary for their navigation of 21st century life (including online settings) for several key reasons. First, the emergence of Web 2.0 has enabled a heightened degree of interactivity within the digital sphere due to the lower bar of technical expertise needed for users to create content and "create learning contexts for themselves" (Greenhow, et al., 2009, p. 248) based on their particular interests, values and learning goals. However, such developments also make it possible for anyone to post information on the Web about any topic they choose, regardless of how accurate or reputable their level of knowledge or understanding may be. As a result, even as students have recently self-reported a preference for digital texts (e.g., due to believing they foster better learning outcomes than traditional texts), such an opinion alone does not engender their ability to comprehend or properly respond to what they read online, nor does it justify any blind faith in the information they encounter in digital spaces (Singer & Alexander, 2017). On the contrary, as previously alluded to, online learners have been found to be susceptible to the influence of homogenous digital "echo chambers", which have gained notoriety for their acceptance and promotion of misinformation that reinforces in-group beliefs without proper fact-checking (Del Vicario, et al., 2016). And naturally, this has led to Web users being repeatedly influenced by heightened polarization in online spaces (e.g., social media, forums), whether that entails showing bias towards similar opinions (Lin & Tian, 2019) or falling victim to the backfire effect in response to alternative opinions shared (Bail, et al., 2018). Thus, failure to teach students proper Web-based source evaluation (i.e., discerning reliable from unreliable information) has thus far appeared to foster their development of a false sense of confidence in ways that can impede their use of digital sources to deeply learn and problem solve (Wiley, et al., 2009).

Second, education policymakers themselves have become increasingly vocal about the stakes involved with teaching students how to embrace a more active, disciplined and systematic approach to learning complex topics. For instance, Michigan Department of Education's K-12 Standards for Social Studies (2019) recently extolled the importance of teaching students how to develop "reasoned and informed decision making (skills) that should characterize each citizen's participation in American society" (p. 105). In line with this, scholars have also repeatedly noted the need for students to develop an ability to prioritize flexible and equitable consideration of different perspectives during learning and decision-making (Mitroff, et al., 1982; Star, 1989), lest they "ignore and to deny (the) basic nature" and complexity of the problems that they are likely to encounter as adults (Mitroff, et al., 2004, p. 176). However, because students have become increasingly dependent on the Web as "a primary resource for information gathering and inquiry" in recent years (Lawless, et al., 2007, p. 290), debate has begun to shift to questioning how students can be taught to utilize such skills within online learning contexts. More specifically, if students today are going to be empowered to meaningfully navigate and engage with

the complexities of real-world societal issues (and how they are reported) more effectively, then it could be argued that the instruction provided by teachers will be inadequate if it fails to account for the need to navigate the nonlinear hypertext and multitude of perspectives inherent to the Web's design (Spiro, et al., 1992). For instance, use of search engines could offer opportunities for students to learn how to become more receptive to alternative viewpoints (including those shared online) that they might otherwise overlook regardless of their merit or ability to potentially deepen their knowledge (Spruce & Leaf, 2017).

But what are the implications if students fail to develop such skills during the digital age? As noted in recent scholarship, when students are not proactively equipped with the skills needed to navigate the variety of perspectives they are likely to encounter (including within the multifaceted, unpredictable and inherently open environment that the Web offers), they are more at risk of developing the habit of searching (both online or offline) for reductive understandings – or the single "correct" understanding – of inherently complex or novel problems, a teaching approach that can be deemed oversimplified and dubious at best and potentially detrimental to their future success at worst. The gravity of this concern can be demonstrated through those who have already identified a growing prioritization of complex thinking and non-routine application of skills in global hiring practices (Trilling & Fadel, 2012; Bellanca & Brandt, 2010). More specifically, artificial intelligence has resulted in the use of robotic workers able to complete well-structured tasks at an exponential rate that often leaves humans "unable to keep pace" (Shanahan, 2015, p. xvi) – a phenomenon already being anticipated or observed in a multitude of job sectors, from banking to law to accounting to manufacturing (Pistrui, 2018), especially with the recent emergence of technologies like ChatGPT (Zarifhonarvar, 2023). In response, within the human labor force, employers in the global market are increasingly seeking applicants capable of applying skillsets that AI is not yet able to effectively replicate (e.g., higher order thinking that involves being responsive to the multitude of perspectives one might encounter), as opposed to "routine manual and thinking skills" that tend to utilize a one-size-fits-all application of knowledge (Trilling & Fadel, 2012, p. 8). Thus, if education stakeholders continue to overly rely on traditional forms of instruction that focus more on mere fact retrieval and reductive understanding of complex topics, they are at risk of not only hindering their students' learning potential, but also their navigation of the world and future employability as adults.

And third, the unprecedented emergence of the COVID-19 pandemic has engendered a prolonged unpredictability on a societal scale that has irrevocably shaped how learners need to be prepared to manage novel and complex situations moving forward – in both their formal learning and their navigation of everyday life. In response to COVID-19, as noted by The World Bank (2020; 2021), education stakeholders, both domestic and international, have increasingly sought to develop and distribute digital technologies that can be readily available to support students' navigation of distance education and online learning on a widespread scale. However, previous scholars have observed that such efforts are likely to

be futile if proper strategies for Web-based learning are not also taught in advance, particularly due to how heightened exposure to a heterogeneity of perspectives across information sources can otherwise lead to online learners feeling "lost in a confusing labyrinth of accidental or ad hoc connections" (Spiro, et al., 1992, p. 68). Without such strategies in place, students' ability to make meaningful decisions for deepening their online learning (or managing their everyday lives more broadly) are likely to be impeded. And indeed, in light of how ill-prepared many school districts appeared to be in response to COVID-19 protocols, numerous negative consequences for learners have already been reported across different age groups, including reduced social, emotional, and academic well-being for high school students (Duckworth, et al., 2021); prolonged absenteeism for middle schoolers, particularly those in disadvantaged populations (e.g., low-income students, EL students with disabilities), which has been associated with reduced academic achievement and impaired social-emotional learning skills (e.g., social awareness, self-efficacy, self-management) (Santibañez & Guarino, 2021); and an anticipated widening of achievement gaps in math and reading for children attending elementary schools (Bailey, et al., 2021). And teachers have not been immune from similar effects, for increased levels of teacher burnout have been reported from the onset of the pandemic even after controlling for ethnicity, location and teaching experience, particularly when COVID-related anxiety and difficulty communicating with parents and/or school administrators were reported as being higher (Pressley, 2021). Put together, for the short-term and long-term sake of both students and those who responsible for teaching them, school leaders' ongoing ill-preparedness to create learning spaces designed to make Web-based learning (mandatory or otherwise) less superficial and overwhelming in nature is a crisis that can no longer be minimized or ignored.

In light of these Web-driven, professionally relevant, and COVID-accelerated concerns, there is a greater need than ever for academics and practitioners to work together not only help students be more self-aware of how they navigate the world around them, but also provide them with meaningful strategies that can empower them to engage in optimal learning strategies more consistently (including on the Web). In particular, as the aforementioned trends and research indicate, this entails acknowledging that many of the situations that 21st century students will encounter –online and in the world at large – are likely to be complex and novel at least to some degree, particularly as global Internet access fosters exponential increases in how rapid and unpredictable one's everyday interactions can be (McChrystal, et al., 2015). Thus, rather than enabling an approach to learning that condones rigid use of prior knowledge in predetermined ways across all situations, it is critical that schools begin encouraging students to apply a cognitive or epistemic *mindset* associated with being "flexible enough to think differently, admit when they're wrong, and adapt to dynamic conditions" for whatever situation is at hand (Snow, 2018, n.p.).

When considering learning theories that might, when translated into practice, help address this pedagogical challenge, one of the most prominent theoretical frameworks that prioritizes such a change in

mindset is *Cognitive Flexibility Theory (CFT)*, which promotes mastery of subject area conceptual complexity, a willingness to shift underlying patterns of thinking to reduce reliance on an oversimplified understanding of difficult or complex subject matter, and adaptive restructuring of one's knowledge to meaningfully respond to novel problems and situations (Spiro, et al., 1987; Blankenship, 2018). With this in mind, CFT argues that when existing curricula (particularly within K-12 schools) offer oversimplified depictions of knowledge as "fragmented, disjointed school subjects", such an approach is likely to significantly hinder students' future ability to navigate real-world problems that are "inherently complex and multidisciplinary" in nature (Ahmed, 2020, n.p.), especially when they involve *ill-structured domains of knowledge (ISDs)* that *in principle* lack "essential" information that is universally applicable across all contexts (Spiro & DeSchryver, 2009). Thus, when discussing what sort of education reform is warranted, CFT scholars begin by arguing that teachers should be encouraged to more proactively support students' use of *higher order thinking*, particularly by reinforcing any patterns of thinking that demonstrate their creation of new knowledge rather than mere reliance on "simple information consumption" (DeSchryver, 2014, p. 4). Beyond this, they postulate that it is also essential for teachers to promote a *non-reductive adaptive worldview* more broadly, one that intentionally embraces complexity throughout the learning process in a manner that can ultimately prepare students "for novelty if a domain aspect (or a domain as a whole) is non-reducible" (Spiro, et al., 2019, p. 959). In other words, if we believe that the "backdrop of existing knowledge" formed by children affects the thinking and behaviors that they will later display during adulthood (including how they process information or problem solve), then CFT argues that classrooms today are not currently fulfilling their potential in terms of helping students develop the mindset they will need to more deeply understand complex issues, more thoughtfully consider different perspectives, and ultimately more successfully respond to novelty across their lives (Sawyer, 2006, p. 11).

In turn, building off what was discussed earlier about learners' current dissatisfaction with navigating online spaces (e.g., Kobayashi & Takeda, 2000; Palanque & Paternò, 1998), CFT scholars have argued that educators need to more carefully consider what steps can be taken within school settings to help students display a more *cognitively flexible mindset* during online learning. More specifically, the learning theory calls for a reevaluation of how students (particularly novice learners) are taught to manage their patterns of cognition and knowledge use during learning tasks that are Web-based, especially when exploring topics that lack the existence of a single "right" answer that is easily identifiable. For example, search engines (e.g., Google) employ information obtained about users (e.g., via browsing histories) to thereafter predict and prominently list websites that they are more likely to subsequently show interest in visiting (i.e., by clicking on corresponding hyperlinks). Under normal circumstances, such a feature can (and arguably often does) lead to the development of *filter bubbles* (Pariser, 2011), which are defined as "personalized ecosystems of information" that, while arguably more user-friendly, often hinder users'

ability to engage with "the full kind of human experience" or variety of opinions that are associated with a given topic (The Daily Dish, 2010, n.p.). Put another way, rather than broadening users' understanding of complex situations (e.g., by highlighting alternative points of view that users *might benefit from being exposed to even if they disagree with them*), Pariser argues that search engines *by design* tend to reinforce what learners already believe or want to hear – potentially leading to a false sense of confidence in their own knowledge and/or premature dismissal of alternative opinions or points of view. And because of this, if teachers fail to make students aware of the Web's infrastructure during learning activities that incorporate its use, those students are at risk of developing detrimental patterns of thinking and online behavior that can actually hinder their deep learning about complex topics in the future. In response to this concern, DeSchryver and Spiro (2008) proposed that learners be taught to regularly conduct a Web-based mode of learning that is designed specifically for the application of CFT principles. Such Web exploration, also known as *learner-initiated, complex, reciprocally adaptive (LICRA) searches*, involves users modifying their search queries *in direct response* to what they find on the Web – a course of action that thereafter leads to new search results showing up, fostering a cycle of reciprocal influence that encourages a more dynamic and less passive way of interacting with the Web (Spiro, 2006e). Overall, if teachers can guide their students to utilize Web-based strategies like LICRA that are more in line with CFT principles, such curricular shifts could play a pivotal role in promoting a way of thinking (e.g., being willing to consider different perspectives) that is far more likely to foster their future success during complex and novel situations that extend far beyond the time spent within classroom settings.

Finally, when thinking about how to begin examining what might go into scholars and practitioners collaborating to identify meaningful ways to translate promising learning theories like CFT (and, by extension, LICRA) into practice, several methodological considerations are important to account for. First, along with being recently identified as a core skill for the future workforce "across all industry sectors and job families" (World Economic Forum, 2016, p. 20), cognitive flexibility (or CFT-based instruction) has also been associated with promising improvements in students' cognition, attitudes and behavior (e.g., Dennis & Vander Wal, 2010; Clemente, 2018). However, such empirical findings have to date been limited by preceding research's tendency to (a) interact with students within laboratory settings or during peripheral curricular activities (e.g., asking them to complete a questionnaire for extra credit); and (b) recruit higher education students who are already proficient in using the Web for research or learning purposes. Because of this, there is a clear need for research that explores what might be needed to translate CFT more substantively into curricula designed for authentic K-12 classrooms specifically. Second, as alluded to previously, in order to more fully ascertain the potential impact of theories like CFT on desired learning outcomes for K-12 students (e.g., Michigan's Process and Skills Standards; Michigan Department of Education, 2019), it is also important to consider how their integration into existing

curricula might impact teachers' ongoing efforts to provide high-quality instruction within their respective classroom settings. Therefore, in the spirit of avoiding the methodological trap of implementing curricula in "pre-constructed" ways that assign teachers "reflective" roles that hinder their ability to provide input or feedback (Doll Jr., 1983, p. 172; Englert, et al., 1998, p. 261), scholarship involving teacher-researcher collaboration should be designed to (a) prioritize the creation of shared goals that are centered around providing "better educational experiences for all" and developing mutual understanding; and (b) proactively attend to the participating teacher's needs and concerns given their "knowledge of the setting under investigation", in order to facilitate the emergence of more ethical translation (Ulichny & Schoener, 1996, pp. 502-503). Finally, given the endemic status of COVID-19 and the resultant precautionary health measures developed for potential use domestically and worldwide, when designing studies with authentic classroom settings in mind, there is merit in accounting for the chance that unexpected transitions to online or hybrid learning conditions (as opposed to face-to-face instruction) might be necessary for the learning context being monitored at some point during said studies' implementation.

With such rationale in mind, the purpose of this dissertation was to undertake the first essential step for developing a framework or model that is intended to be flexible, open, adaptive and multi-perspectival in nature, in order to inform the conduct of research aimed at bidirectionally intersecting learning theories aimed at addressing changing times (and resultant changes in students' learning goals) with teachers' understanding of said theories in relation to the constraints of their teaching "realities". More specifically, this study seeks to begin planning how such framework research would be undertaken (e.g., which parameters would be explored in depth), in order to help teachers and researchers develop mutual understanding of each other's ideas and perspectives and ultimately better translate learning theories like CFT/LICRA into practice (e.g., to better support student thinking and learning within authentic K-12 classroom settings in the digital age.) This was done by conducting an exploratory case study aimed at analyzing in detail a series of Zoom-based planning discussions between (a) a 9th-grade U.S. History teacher operating within a local Michigan public high school classroom setting (who, from the outset, overtly expressed support for the principles underpinning CFT); and (b) two CFT/LICRA researchers, including the originator of CFT and the author of this dissertation (the latter of whom has identified creating adaptive learning environments as a major research interest and previously examined the effects of CFT/LICRA on postgraduate students' learning about specific historical events). In a manner designed to highlight noteworthy moments identified from those six planning sessions, which were predominately focused on brainstorming how the teacher might integrate cognitive theories of learning like CFT/LICRA within his professional "reality", analysis of the interactions between the teacher and researchers was aimed at capturing each party's respective and evolving thoughts and opinions about what might best support the teacher's ongoing efforts to help his students more deeply

learn and meaningfully apply their knowledge of U.S. History within his classroom setting and beyond. In addition, the modality of the interactions (i.e., over Zoom during the planning discussions and email as needed) was intended to minimize the risk of logistical constraints interfering with the ability of researchers and teacher to interact as needed for the study (e.g., due to illness, in anticipation of restrictions that might be implemented by the teacher's school district to combat COVID-19 variants).

When discussing the methodological design of both the layout and agenda implemented for the teacher-researcher interactions that were central to this dissertation study, it is important to explicitly note several distinct subgoals kept in mind throughout the planning process. First, high priority was placed on finding opportunities to thoughtfully explore any noteworthy areas of "mutual understanding" between the researchers and teacher that were discovered across the collaboration, particularly in relation to their respective opinions about how cognitive theories of learning like CFT/LICRA might be utilized to help support deeper learning by the teacher's students (and, ultimately, high school students more broadly). Second, in response to struggles the teacher opened up about early in the collaboration, time was allotted to discuss any constraints that have affected (or might affect in the future) the teacher's pedagogical practices or his efforts to navigate his professional "reality", including issues affecting K-12 education more broadly (e.g., overemphasis on standardized testing) and challenges unique to the teacher's specific teaching context (e.g., guidelines within his school district that could restrict his ability to use CFT/LICRA to help his students deeply learn about complex and ill-structured topics). Third, under the assumption that this study could ultimately serve as the first stage of a multi-iteration collaborative undertaking between the researchers and teacher, space was given to brainstorm possible strategies for more formally integrating CFT/LICRA within the teacher's classroom setting, while also making note of any meaningful experiences or setbacks reported by the teacher for future reference. Fourth, in line with the IRB protocols in place for this study (i.e., not allowing any direct student data), even as strong emphasis was placed on strongly encouraging the teacher to share any anecdotes he found relevant for the collaboration in a journalistic manner (e.g., anything pertaining to his students' successes and/or struggles with or without instruction aimed at incorporating CFT principles), he was also cautioned to deidentify any and all examples of student performance or behavior that he chose to share with the researchers. And finally, steps were implemented to account for any potentially relevant communication or exchanges of information between the collaborators that complemented their main dialogue over the course of the study, including materials shared (e.g., reflective notes written by the teacher about CFT/LICRA) and any correspondence outside the discussions themselves (e.g., emails exchanged for planning purposes).

It was expected that this study's collaboration-based methodological approach would lead to preliminary insights, informed by both researcher and practitioner lenses, about what pedagogical steps for translating cognitive theories of learning like CFT/LICRA into curricular practice within the

collaborating teacher's classroom setting might be most promising to explore further in future research. In particular, this study sought to identify strategies (including those already being utilized by the teacher himself) that could eventually build upon the principles of CFT/LICRA to foster noteworthy shifts in his students' cognition, attitudes and/or behavior that have been associated with increased cognitive flexibility and/or higher order thinking in preceding research, including (but not necessarily limited to) more complex or thoughtful consideration of alternative views or perspectives, enhanced perception of the interconnectedness between different ideas, and refined methods for approaching Web searching and evaluating sources of information encountered online. In turn, through documenting anecdotes and other insights shared by the teacher and researchers with each other (with strong emphasis placed on proactively centralizing what the teacher shared about his professional "reality" and its constraints), it was also anticipated that the degree to which various factors, whether cognition-related (e.g., prior topic-specific knowledge, epistemic beliefs shared with the teacher or displayed during class, self-reported motivation to learn) or otherwise (e.g., the degree of support offered by school administration for the teacher's pedagogical goals, the impact of negative feedback from parents), might moderate students' responses to instruction integrating principles related to CFT/LICRA could also begin to be ascertained. Finally, through noting recommendations made and/or concerns raised by the teacher and researchers, it was hoped that key points of consideration could be identified for developing a translational framework aimed at helping teacher-researcher communities of practice bring together learning theories and pedagogical practice within the teacher's unique classroom setting and K-12 classrooms more broadly. If such results have been adequately obtained, in a manner that can ultimately help leaders from academic and practitioner spaces come together to identify ways to better teach today's students how to more deeply learn and more effectively apply their understanding of ill-structured topics (including during their Web navigation), then it is hoped that this dissertation's findings can play an invaluable role in filling a significant void currently found in educational institutions (particularly in K-12 schools in the United States) – namely, the need to prepare students to more adaptively assemble their knowledge in ways that are better suited for their need to navigate our increasingly complex, novel and ever-changing world.

CHAPTER 1: LITERATURE REVIEW

1.1: Using Teacher-Researcher Communities of Practice for Meaningful Translation of Theory into Practice in Education

As a starting place, why is it so important to examine the translation of theory into practice on a broader scale? On the one hand, for many decades, educational researchers have explicitly acknowledged the differences that exist between conceiving and implementing theories of learning or other ideas that are derived from academia. More specifically, when testing the veracity of a given hypothesis, one cannot blindly presume that "the method where the laboratory ideal prevails" under controlled conditions will also be similarly effective within authentic classroom settings (Dewey, 1904, p. 10). Why is it not possible to make such an assumption? If we reflect upon the nature of being human through a constructivist lens, in terms of how our understanding of the world stems from the ongoing "interaction" between our preexisting knowledge and the "phenomena or ideas with which (we) come into contact", then every stakeholder involved in the field of education will inevitably formulate their own "idiosyncratic understanding" of whether or not a particular theory or idea has veracity and how it might be utilized for potential future use (Richardson, 1997, p. 5). With that in mind, what criteria should be used to evaluate its merits, and how should it be approached if it appears to be "at odds with formal disciplinary knowledge" being accepted within the learning context(s) that might be impacted (p. 5)? And such an issue of translation has been exacerbated by the unfair treatment of certain parties within education – namely, how teachers have had their perspectives dismissed and found themselves directed to passively adhere to guidelines imposed by "external authorities" (e.g., textbooks, policymakers) that know or account for "little about their teaching contexts or students" (Englert, et al., 1998, p. 261).

With this in mind, there appears to be merit in heeding Schwimmer's (2017) recognition of "an ethics of translation" as being "fundamental" to the process of sharing knowledge derived from education research (p. 57). More specifically, she argues that academics must make room for the creation of "a third space, a third language" with practitioners that can better "problematize" the translation of theory into practice – namely, by making space for relevant meaning that can derived from preceding scholarship, but also allowing space to "renounce the ideal of perfect translation" in favor of embracing whatever might be needed for its use within a particular learning environment (p. 58). And if researchers are to adequately navigate the "opacity" and "uncertainty" of translation within such a "third space", then such efforts need to provide adequate opportunity for teachers they collaborate with to offer their input for the purpose of creating a "posture of translation" that is best suited for their students and their unique needs (p. 59). After all, when brainstorming what might be beneficial to implement within a given classroom, why overlook or minimize the perspectives of those engaged in the most "conduct" within that

setting (Dewey, 1904, p. 10)? Such an oversight risks leaving teachers "isolated" from key conversations with other education stakeholders in ways that could ironically affect the learning outcomes of the very students those teachers are responsible for instructing (Doll Jr., 1983, p. 172). In this sense, Kirk and MacDonald (2001) were overt in recognizing that the success of curricular reform largely depends on teachers offering their "knowledge of their students, available resources, and the obdurate practicalities of their work", for such insights are not able to be fully replicated or explored under laboratory conditions (p. 564). And indeed, such a prioritization of teacher voice has strong empirical support, for as pointed out by Kahlenberg and Potter (2014, para. 4-5), enabling teachers' sense of "collective responsibility for student learning" (e.g., through building "strong relational trust" between teachers and administrators" or offering chances for "strong professional development") appears to be associated with not only stronger and more equitable learning gains in secondary students across different SES levels (Lee & Smith, 1996), but also improved school quality more broadly (Bryk, et al., 2010). Thus, if researchers are serious about wanting their translation strategies to be ethical and effective in authentic learning environments, they must take steps to duly account for the "authoritative voice" of the teachers who are most intimately attuned to the "local contexts of implementation" being examined (Kirk & MacDonald, 2001, p. 565).

For this reason, emphasis has been increasingly placed on education researchers taking the appropriate steps to develop a *community of practice* (CoP) that is authentic and mutually beneficial for both the practitioners (teachers included) and researchers involved in whatever collaborative work is at hand. Building upon philosopher Stephen Toulmin's (1972) notion of "intellectual ecologies" that can "shape what can be known, what counts as appropriate action, and through this what counts as science" (Rex, et al., 1998, p. 409), communities of practices are centered on several key tenets for fostering meaningful meaning-making within shared spaces, including the following (Wenger, 1999, pp. 73-79):

(a) prioritizing the creation of working conditions that can enable the "mutual engagement" of all participants, including identification of "complementary competencies" that exist between members and a willingness to develop a "shared practice" around such overlaps even in in the midst of "disagreements, challenges and competitions" (pp. 73-74, 76-77);
(b) proactively displaying an ability and willingness to enact a "negotiation of a joint enterprise", namely through giving a collective and interconnected effort to "(make) claims processing real and livable" even when "individual situations and responses vary" (pp. 77, 79); and
(c) forming an "indigenous enterprise" within the collaborative space, where the participants are not perceived as "self-contained entities", but rather for their ongoing respective roles within "larger contexts – historical, social, cultural, institutional" and their resultant need to navigate "specific resources and constraints" that are both articulated and unspoken in nature (p. 79).

On a broader scale, such an approach to forming communities of practice has been framed as not being "merely a matter of dialogue", but rather, as a more substantive imperative for each participant to be intentional and thoughtful in their words and actions in order to better "understand each other's positions and what each contributes to a dialogue" – including where their fellow collaborators' perspectives might be the same, complimentary or contradictory, and why (Rex, et al., 1998, p. 406). This point is worth emphasizing for multiple reasons. First, this framework for communities of practice assumes that the language a person uses naturally serves as "the representation of constellations of intellectual or theoretical orientations" that underpin "the ground from which (their) new ideas are articulated" (p. 410). Thus, not clearly defining and revisiting each other's perspectives (including how a given person's dialogue serves to articulate their perspective) engenders the risk of participants misunderstanding each other (e.g., falling victim to jingle and jangle fallacies; Casper, et al., 2018), which can make collaborative discourse less constructive and "more like a Tower of Babel" (Rex, et al., 1998, p. 406). And second, if time and space is not allocated for understanding and meaningfully capturing the "lenses" that underpin practitioners' and researchers' distinct uses of "inquiry processes and procedures" within their respective "larger contexts" (including respecting and carefully documenting the language they each use to express "lenses" of significance to them), such negligence can thereafter lead to readers of education research falsely assuming or prescribing meanings to a given collaboration's dialogue based on their "own conceptual points of reference or from what they suppose the writer's are" (p. 412). And such a misstep can ultimately hinder their understanding of how specific terms or conceptual frameworks were applied for the benefit of the learning environment of focus or even the collaboration itself.

With this in mind, several key principles identified in prior research for communities of practice involving teacher-researcher collaboration specifically bear direct relevance for the focus of this dissertation. First, it is strongly recommended that space be allocated for "the negotiation of new roles for teachers and researchers" across the collaboration, including allowing teachers the chance to engage in decision-making that is relevant for "curricular issues that matter to them" (Englert & Tarrant, 1995, p. 335). While such negotiations might be initially "uncomfortable" (p. 335) and a challenge to fully document, it is critical not only for fostering the most mutually beneficial collaborative space possible, but also for highlighting more fully to the reader how the "'private' worlds of the participants" evolves into a "shared social world" that is built upon mutually developed intersubjectivity (Rommetveit, 1976, p. 202). Second, scholars have placed emphasis on noting when and how "each member brings…a unique set of questions" and ideas that benefit the CoP as a whole, including giving proper recognition to the teachers' ability to "contribute to the knowledge construction process" (Englert & Tarrant, 1995, p. 335). By doing so, researchers can play an active role in promoting "teachers' ownership of the approach" and empowering them to "develop new views of themselves as experts and authors of curricula" (Englert, et

al., 1998, pp. 255, 261), as opposed to reinforcing their expectations or fears that "a body of knowledge (is) simply being 'handed over'" to them (Englert & Tarrant, 1995, p. 326). Indeed, if such a consideration is not made, the teachers involved may very well begin to develop the belief that they are being perceived as subordinate "recipients of research", rather than fellow "change agents" who have equal and unique value within the collaborative space being created (p. 326). Third, it is vital to ensure that any actions taken within any given CoP are consistently "grounded in and responsive to the changing work conditions of the teacher" (Dixon & Green, 2009, p. 284). Put another way, by making sure the teachers' pedagogical "goals and negotiated analyses" are firmly situated as "the guiding principles for the research directions" undertaken within their particular teaching contexts on an ongoing basis, researchers can adaptively balance recognizing teachers as "full members of the research team" with appropriately "honor(ing) their (professional) identities" (pp. 287-288). And fourth, collaborations should provide the participating teachers and researchers with the "time" necessary for them to thoughtfully "construct, experience and transform…(their) collaborative communit(ies)" in ways that are best suited for addressing the teachers' idiosyncratic classroom needs as they arise (Englert & Tarrant, 1995, p. 335). For example, when discussing what could potentially affect high school teachers who are participating in collaborative spaces, McLaughlin and Talbert (2007) identified the following constraints (pp. 152-153):

(a) the "professional culture" that oftentimes shapes the teacher's sense of "their professional responsibilities and attitudes towards students" (e.g., the quality of high school leadership, the existence of "subject department boundaries" that might impede in-school collaboration);
(b) a "pervasive culture of student disrespect" for U.S. high school teachers that (when combined with a perceived lack of support or resources) can often "depress teachers' commitment and spirit" – with four out of five high school teachers across different learning contexts reporting low morale (in a manner likely exacerbated by COVID-19; Pressley, 2021); and
(c) K-12 schools' noticeably high reliance on "high stakes accountability systems that press for immediate test score gains", which can demotivate teachers from putting in the effort to "spend time critically reflecting on practice…or investing in professional growth".

In line with these sentiments, four considerations emerged as being foundational for this study. First, high importance was placed on *establishing "early patterns of respectful interaction" between the teacher and researchers* involved in the study, including engaging in careful and thorough discussion of each collaborator's ideas when brought forth, treating everyone's ideas equally, encouraging "productive debate" and promoting a "shared" sense of responsibility over how the collaboration itself unfolded (Herrenkohl, et al., 2010, p. 87). In part, this was intended to duly welcome multiple perspectives when

tackling the inherently complex goal of integrating theories of learning into K-12 instruction, namely by acknowledging that "one person did not have all the answers" and that each collaborator could "offer something of real value" that was unique (p. 87). But beyond this, it sought to build upon preceding scholarship focused on online learning, for even as researchers like Lawless, et al. (2007) have identified instructional features (e.g., pre-task reading activities) that seem to be associated with positive learning outcomes in Web-based learning contexts (e.g., more nonlinearity in Web navigation, higher engagement, greater knowledge gains), proper use of teacher direction has been found to have an impact on how effective those features are (Okolo & Ferretti, 2020). In this sense, by creating a space where the teacher and researchers could each feel comfortable sharing their respective ideas from the onset of the collaboration, it was believed that the maximum likelihood of success could be attainable for any translation strategies that might be identified during the study. Second, Reimer & Bruce (1994) extolled the need to balance the introduction of ideas derived from academic theory or empirical research with the need to also account for collaborating teachers' "sense of how to organize this particular setting or this particular group of children, or what might be the most effective and efficient way of working" within the contexts that they professionally manage (p. 215). For example, scholars have identified promising strategies for using flow theory to guide students' Web navigation, such as developing their sense of being "present" and operationalizing their "perceived challenges" through assigning tasks like "locating information" and "building search strategies" (Chen, et al., 2002, pp. 273-277). However, teachers also play a pivotal role by tending to other aspects of a learning environment that might otherwise be unaccounted for, such as (a) balancing a given task's difficulty with the skills needed to complete it; or (b) actively monitoring the level of engagement or immersion being displayed by individual students (Shernoff, et al., 2003; Pearce, et al., 2005). With this in mind, this study sought to create a CoP that *explicitly recognized the "complimentary perspectives" held by the teacher and researchers involved in the collaboration* – namely, by making it a priority early in the collaboration to identify evidence of "shared basic beliefs, work habits, and practices" (identified as "mutual understandings" or "meeting points" during this study), which could then be built upon to develop a "value system" that could "guide…joint work with each other" (Herrenkohl, et al., 2010, p. 86).

Third, in line with Englert and Tarrant (1995) reporting teachers' frustration when regarded as mere "recipients of research", Ulichny & Schoener (1996) noted teachers' frequent distrust toward researchers due to the "distanced stance of the silent researcher-observer" often displayed during field research conducted in classroom settings (p. 502). While such "distance" and efforts to identify "good and bad practices" are likely not intended to be judgmental, such an evaluative approach can nevertheless come across as arrogant due to inadvertently reinforcing the idea that researchers "can see more, and more accurately, than the teacher" through their use of "rigorous methods" (pp. 502-503). Therefore,

high priority was placed on trying to avoid conveying any notion (even accidentally) that the researchers involved in this study's collaboration were "more credible knower(s)" (p. 503) of how theories of learning should be translated into practice. Rather, in the process of building the collaboration around a "joint commitment" to explore the complexities of such a topic, strong emphasis was placed on them *explicitly recognizing the teacher as possessing "the most knowledge of the setting under investigation"* and navigating their interactions with the teacher during the collaboration accordingly (pp. 503, 518). Finally, rather than seeking to design a "full implementation" of predetermined pedagogical strategies, researchers involved in collaborations with teachers need to be prepared for any potential teaching practices discussed to be "constantly under development and revision in the face of continual stumbling blocks" (Weinstein, et al., 1991, p. 345) that the teachers might need to navigate within their classrooms. Put another way, if we want to be thorough in ascertaining what might be relevant when trying to help students develop a deeper understanding of topics from their school curricula (Feltovich, et al., 1993), then there is a need to acknowledge and keenly make note of which aspects of teachers' current professional "realities" (e.g., their need to account for students' different levels of cognition, affect and/or motivation; Fox & Maggioni, 2016; logistical constraints caused by COVID-19) are hindering their ability to engender that. Thus, the researchers involved in this study sought to be as responsive as possible to *the constraints that the teacher collaborating with them reported operating under*, namely by using the collaboration itself as an opportunity to offer whatever "resources and…emotional support" they could to help the teacher "work through the constraints" imposed upon him and/or his students (Weinstein, et al., 1991, p. 345).

1.2: The Human Brain, Ill-Structured Domains and Deep Learning in Formal Educational Settings

But even as the need to reevaluate the relationship between practitioners (including teachers) and researchers has emerged as a valid stance to take in principle (e.g., to empower teachers and improve relationships more broadly between education stakeholders), such a position can also be justified by the urgent need to identify ways schools can become less outdated and more proactive in "up-skilling and retraining" their students to better navigate societal changes that are rapidly unfolding (Gray, 2016, n.p.). More specifically, as the World Wide Web has emerged and become an entrenched part of everyday life, such developments have led to unprecedented changes in how humanity stores and shares its collective knowledge (Leu, et al., 2007), fostering a need for educators to critically examine how they might better prepare students to solve problems and adapt to situations they will likely encounter in the future. That being said, even in the midst of such seismic technological shifts, the human brain's capacity for learning and retaining knowledge has "remained relatively unchanged" for thousands of years (Shanahan, 2015, p. xvi). Because of this, it is worth considering the current (and potential) relationship that exists between

how humans naturally tend to think, the conditions that appear to bring the best out of their efforts to learn and the affordances (and hindrances) provided by the features associated with use and/or navigation of the Web and other digital technologies. To begin, when thinking about how the human brain (as an organ) operates, Schank & Abelson's (1977) schema theory postulates that humans cognitively develop mental "scripts" (i.e., schemata) for categorizing specific types of information over time based on their experiences and what they learn from them. In turn, such "scripts" then help with rapid retrieval and application of such information as needed in the future (i.e., in order to make sense of a given context and thereafter effectively interact with it), such as navigating a fancy restaurant for the first time by using schemata cognitively stored following exposure to similar dining "scenes" in prior situations (e.g., internalized strategies for "greeting the hostess", "looking at the menu" or "ordering your meal"). And within educational settings, it has traditionally been argued that such schemata can be incredibly useful during exposure to a new topic, course or learning environment, such as when previously-developed "scripts" can help students properly self-monitor their classroom conduct during interactions with new teachers and peers or when applying their knowledge to learning activities that they might be unfamiliar with. Just as importantly, Schank & Abelson postulate that in order for such "scripts" to be useful when retrieved, they need to be meaningfully transferred to properly suit their use for the situation at hand.

But what should people do when the "scripts" that they have acquired fail to account for an entirely unexpected or novel event, such that simply retrieving and regurgitating preexisting facts or schemata fail to help them determine how to properly apply their knowledge? Such a circumstance has been found to arise when students must use knowledge from ill-structured domains, for said domains' inherent lack of "essential" information means that students cannot blindly rely on a definitive set of knowledge (i.e., specific concepts or information) to ensure successful navigation across all possible future situations that might require use of that knowledge (Spiro & DeSchryver, 2009). Put another way, unlike information from *well-structured domains of knowledge (WSDs)*, which can be universally applied in a manner consistent with how they are taught (e.g., using schemata or "scripts" for adding numbers to solve future math problems that, at least in part, entail use of addition), ill-structured knowledge by its very nature "*must* be inferred to fit the situation at hand" through contextually assembling knowledge "fragments" from prior experiences in a manner that cannot be fully predicted beforehand (p. 112). And indeed, the 21st century has been characterized by "a process of globalization" that entails a deeper understanding of how to combat issues associated with global competency (e.g., operating within unpredictable markets, dilemmas associated with economic or cultural inequality) (Mansilla & Jackson, 2013, pp. 3-4) – resulting in a growing demand from employers for workers characterized by a skillset associated with stronger management of situations that are ill-structured in nature, such as adaptability, critical thinking and complex problem solving (e.g., Dede, 2010; McChrystal, et al., 2015; Gray, 2016).

What this means is that for school subjects centrally defined by their inherent irregularity and variation in application of knowledge across different real-world contexts (i.e., when they involve ISDs), it could be argued that letting students develop predetermined "scripts" for their use of subject-specific knowledge is a pedagogical misstep that enables students to develop habits of thinking that are ultimately detrimental to their lifelong learning. Why might that be the case? Prior scholars (e.g., Spiro, et al., 1988) have long emphasized the dangers of inappropriately relying on methods of teaching that, at face value, seem to be effective for introductory learning of ISDs, such as "compartmentalizing knowledge, presenting clear instances (and not the many pertinent exceptions) and employing reproductive memory criteria" (p. 375). On the one hand, it is understandable why such instructional strategies might be instinctively gravitated to in a practical sense, especially when teaching novice and/or younger learners. For example, using "reproductive memory criteria" to create exams (e.g., including test items primarily focused on fact recall) can make it easier for teachers to design, implement and use assessments to monitor students' learning growth. However, if students in a school subject centered on ill-structured knowledge are instructed in ways that inappropriately overlook the inherent complexity and case-centeredness involved in the topics being taught, they are at risk of developing "foundations in knowledge and…an approach to learning" (p. 375) that actually hinder their future advanced knowledge acquisition and application – namely, by promoting an oversimplified understanding of the subject (e.g., overly relying on predetermined "scripts") that hinders their proper use of such knowledge in future situations.

Such a concern begets the following pedagogical question: what might help educators discern whether or not students are actually deeply learning knowledge from ISDs? As previously alluded to, educators can start by assessing *how* students attempt to apply prior knowledge from such domains to solve problems that they might encounter (particularly when they are novel and/or complex in nature). Naturally, expectations of what that should look like largely depend on the specific subject that a given set of students are being taught, as well as the educational stage (i.e., grade level) that they are enrolled in. For example, when discussing the learning outcomes desired for K-12 students being taught history (or social studies), significant emphasis has been placed on their need to "understand the complexity" of the subject, in a manner that can ultimately equip them with the knowledge necessary to develop "the habits of mind essential for democratic citizenship" (Michigan Department of Education, 2019, p. 102). And for this purpose, one of the skills listed as critical for students to learn in high school (at least within American educational contexts) is how to acquire and meaningfully use information across a variety of credible sources – in a manner that considers their "origin, authority, structure, and context", while also acknowledging the "bias and frame of reference or perspective" of the authors themselves (p. 87). Why is this consideration regarded as being so important? Put bluntly, students do not learn in a vacuum; and when political leaders and policymakers promote "historical contents" based on the values they wish to

elevate (or minimize) in society, efforts that are directed at influencing what students learn (especially within K-12 educational settings) can be interpreted as a means to "both set up a national consciousness and…justify ideological beliefs" (Carretero, et al., 1994, p. 360). Because of this, K-12 students' ability to learn how to use a "range of generic, personal and context-based criteria" to thoughtfully and critically evaluate "information, messages, beliefs and values" presented to them (United Nations Educational, Scientific and Cultural Organization, 2012) – not only through the media, but also through what they are taught in the classroom (e.g., textbooks included in their curriculum) – is itself critical for shaping not only their growth as learners, but also their future efforts to navigate the world as global citizens.

To summarize, if schools (and, in turn, communities of practice that are designed for facilitating collaboration between researchers and practitioners operating within K-12 settings) respond to such societal change in ways that approach the growing need to embrace complexity in a "superficial and counterproductive" manner, they are at risk of acting in ways akin to "lip service" that are more likely to ultimately serve as "a recipe for failure" (Rotherham & Willingham, 2010, pp. 18-19) – both in terms of students' knowledge of school subjects and their ability to emerge as informed and employable adults. Instead, they must give greater priority to exploring how students are being taught to learn and apply ill-structured knowledge, as well as what can be done to promote "habits of mind" that can help them more effectively navigate complexity and novelty (i.e., issues not solved by relying on a "script") in the future.

1.3: The World Wide Web: What It Can Do for Learners vs. How It Is Actually Being Used

When thinking about how translation of theory into practice might be used to foster habits of mind properly suited for students' growing need to navigate the complexity and "constant change paradigm" that the 21st century is characterized by (Talin, 2020, n.p.), one of the key societal factors identified that communities of practice could home in on is how the Internet has impacted learning on a global scale. For instance, even before the onset of the COVID-19 pandemic (and mandatory online instruction as needed), Coiro (2011) noted that at least 97% of K-12 U.S. classrooms had already added computers connected to the Web, with 94% of online adolescent students already using the Internet for academic purposes (citing Gray, et al., 2010; Lenhart, et al., 2001). With such prevalence in mind, if one of the primary goals of educators is to help students develop "habits of mind" that enable them to think in less "plaster-cast" ways across whatever situations they might encounter (Spiro & Jehng, 1990), then in theory, there are several reasons why utilizing the Web during classroom instruction could be considered pedagogically reasonable when teaching subjects that incorporate ISDs. First, in light of the emergence and development of Web 2.0 over the past couple decades (Greenhow, et al., 2009), a relatively low level of Web publishing or navigation skills is currently needed to find a near-infinite variety of learning

activities (e.g., skill-based games, lectures, workbook-like exercises, tests/quizzes) or subject-relevant information online (Baker, 2007). Thus, although it is still not always a given, educators in the 21st century with access to the Web have a far wider array of resources at their disposal for exploring the inherent complexity of ISDs in their classrooms compared to what was possible in previous generations. Second, building off Csikszentmihalyi (1975), Chen, et al. (2000) observed that the Web is potentially well-suited for creating optimal flow experiences due to its capacity to heighten students' intrinsic interest and engagement in several key ways, including offering "immediate feedback", providing avenues for teachers to provide instruction in ways more finely tailored to students' "personal skills" and enabling a heightened sense of "potential control" during learning activities (p. 260). Even further, as a result of having such features, the Web can also offer teachers greater pedagogical flexibility to modify the "structural conditions" of their lessons as needed, in order to better achieve a proper balance "between challenges and skills" even when covering complex topics under less-than-optimal learning conditions (Nakamura & Csikszentmihalyi, 2014, p. 243; Shernoff & Csikszentmihalyi, 2009, p. 137); and given that COVID-19 has demonstrated how quickly teaching conditions schools might take for granted (e.g., use of in-person instruction) can be altered or removed without warning, such flexibility is more vital now than ever before. Finally, by nature of its nonlinear design and functionality, the Web promotes the development of "web-like" knowledge structures (Spiro and Jehng, 1990) that naturally draw connections between different ideas (i.e., like strands of a spider web) that can thereafter be retrieved with greater attention to differences in perspectives held and case-by-case variability. Because of this, the Web could arguably help foster comprehension skills and learning habits that have been observed in good readers, such as evaluating different texts (and their structures) in relation to their reading goals, accounting for authors' underlying beliefs and intentions, constructing and revising meanings while reading texts, and adjusting how they seek out and read texts as needed (Duke & Pearson, 2002, pp. 205-206).

Put together, rather than enabling inappropriate reduction of the complexity of topics that are ill-structured in nature, if K-12 classrooms can capitalize on the Web's capacity to promote a "expansive and flexible worldview" that is characterized by a "preference for complexity" (Spiro, et al., 1996, p. S58), they will be in a better position to help their students retain more knowledge and feel empowered to more successfully navigate complex real-world issues (i.e., issues that do not have a single "right" solution). However, multiple concerns have been raised over what it might entail for such classrooms to be adequately equipped to tackle such a pedagogical challenge. On the one hand, returning to prior research conducted by Ramírez-Orellana, et al. (2012), teachers identified as having more experience (i.e., over 15 years) displayed significantly more negative attitudes towards use of the Internet within their respective classroom settings, while also being more likely to cite "lack of experience, training and usefulness" as reasons to have skepticism about the merits of its use (p. 151). Such findings indicate that educators who

are older in age – and thus, who could presently still be identified as "digital immigrants" who learned how to use computers during their adult life, at least to some degree (Wang, et al., 2013) – might have lower confidence in their own ability to use computers, resulting in greater apprehension towards using such technology professionally compared to more familiar, traditional, print-based teaching resources. But beyond such individual circumstances, on a broader scale, Spiro, et al. (1992) were quite explicit in acknowledging that utilizing the Web to its fullest potential for online learning is far from being easy or straightforward. On the contrary, they acknowledged that learners navigating the Web (or nonlinear hypertext in general) are at risk of quickly feeling overwhelmed by the sheer amount of information made available to them online, particularly if they are not equipped with the skills needed to "find relevant information" (Kobayashi & Takeda, 2000, p. 146). Because of this, Spiro, et al. (1992) call for grounding the design (and navigation) of any nonlinear medium like the Web in "a suitable theory of learning and instruction" (p. 68) that can enable its effective use within formal learning environments and beyond. Put another way, if K-12 teachers wish to create online learning experiences for their students that are higher-quality, more fulfilling and even autotelic in nature (Chen, et al., 2000), then they must be prepared to teach in ways designed to help their students better navigate the Web's inherent scope and nonlinearity.

But what are the implications if such a system of instruction is not implemented? To begin, the way certain websites are designed can actually *hinder* students' efforts to learn by encouraging them to engage in online behaviors that discourage an embracing of complexity – in a manner that sadly aligns with how people often naturally gravitate to using them. For example, Wikipedia was created to serve as a collaborative platform aimed at publicly collecting, editing and sharing information about a near-infinite variety of topics, historical events and individuals (in a manner where different pages could be connected via hyperlinks); and if regarded as an easily accessible source of information that can provide a basic overview of a given topic, the website has been quite successful. However, users often regard Wikipedia as "the first stop of choice for *any* (online) inquiry" and even "another *central repository* of authoritative knowledge" (Spiro, 2006e, p. 4). This frequently results in the emergence of maladaptive mental "scripts" – ones that embrace close-ended Web searches (i.e., finding answers through discovering the "right" Wikipedia page) and fail to consider the appropriateness of their use in a given situation. This is not to say that close-ended Web searches are always ill-suited for one's learning, since such an approach can be potentially optimal when exploring topics involving well-structured domains of knowledge (e.g., learning the rules for proper use of addition in algebraic equations). However, deep learning of ISDs requires more expansive (i.e., open-ended) searches built around the recognition that there is usually not a single "right" answer to find. Because of this, if students are not informed about the dangers of utilizing websites like Wikipedia to explore a given topic without due consideration of the domain(s) of knowledge involved, they are at risk of oversimplifying the complexity of what they are learning through developing

a learned overreliance on "fixed protocols or rigidly prepackaged schemas" (Spiro, et al., 1988, p. 377) – namely, ones that assume that finding the "right" website is all it takes to learn about a complex topic.

But beyond the layout of specific websites, concerns also exist regarding how Web users can be influenced by algorithms embedded within the functionality of online search engines (e.g., Google, Yahoo, Bing). Search engine systems are designed to build off the "different information needs" of each individual, namely through using both explicit (i.e., Web users customizing their search preferences) and implicit means (e.g., browsing history, IP addresses, cookies) to create distinctive user profiles that boost the "relevance and importance" of search results thereafter presented (Bozdag, 2013, pp. 211-212). And although the specific methods utilized by algorithms vary between different search engines (Chung, 2008), such efforts generally lead to a systemic digital bias that can significantly shape the nature of users' online experiences (Lei & Clemente, 2020). This is because the algorithms integrated into the functionality of search engines are designed to "please the searchers" using them (Salehi, et al., 2018, p. 1), regardless of the subject domain being explored (Mowshowitz & Kawaguchi, 2002) – namely, by showing what they predict said individuals will want to see (and click upon) in their search results and "leaving out potentially important but less-agreeable information" (Salehi, et al., 2018, p. 1) even if it might make them more informed in the future. Such concerns are compounded by users' tendency to have "strong faith in what search engines think is best" (p. 1), resulting in their showing strong bias towards websites listed at the top of search results provided during Web-based search queries (O'Brien & Keane, 2006), regardless of whether they are using desktop computers or mobile devices (Petrescu, 2014). On top of all this, users often fail to consider how available features of search engines can refine their search queries (Lewandowski & Höchstötter, 2008), as well as how revenue maximization can shape search results list just as much (if not more) than the relevance of a website for their search query goals (Kamoun, et al., 2019). Potentially as a result of these factors, multiple scholars have recently noted U.S. high school students and adults' noteworthy difficulties with critically evaluating what they read online, including identifying "native advertising" designed to deceivingly "mirror the format" of non-paid news content (Amazeen & Wojdynski, 2020, p. 1965) and not being persuaded by "weak signs of credibility", such as a website's "look" or quantity of information (Breakstone, et al., 2021, p. 505). Put together, if left unaddressed, the design of Web-based search engines can (and often does) enable students to passively accept online information in a way that fosters their susceptibility to filter bubbles during Web-based exploration (Pariser, 2011) – which appears to be hindering their deep learning by discouraging their efforts to explore complexity or actively monitor the credibility of what they are reading online.

And finally, beyond the formation of "rigid" and passive Web-based behaviors, learners' broader mindsets can also be profoundly shaped in several troubling ways by their time spent online. First, even though it is to be expected that users' choice of Web sites will become "increasingly distinctive" as they

explore ill-structured topics online (Cothey, 2002, p. 77), their deeper understanding of those topics can be greatly hampered if they are not also encouraged to critically evaluate their existing beliefs or consider the validity of other perspectives encountered during their Web navigation (Lau & Coiera, 2006). And indeed, such a complication has been repeatedly documented. For example, under natural online searching conditions (i.e., interacting with political online messages in the weeks before the 2012 United States presidential election), Knobloch-Westerwick, Johnson, et al. (2015) found that Web users displayed strong biases in selective exposure that were in favor of "attitude-consistent online search messages" and avoidant of "attitude-discrepant messages" (p. 181), particularly when they attached high importance to the issues being explored. Second, users can often underestimate the number of online users who merely consume what others have created (Baeza-Yates, 2016), leading to a dangerous overestimation of the amount of "evidence" for a particular stance that actually exists (e.g., 65% of anti-COVID vaccine content found online can be attributed to 12 users known as the "Disinformation Dozen"; CCDH, 2021). And third, users' tendencies to excessively favor their own beliefs and inappropriately dismiss alternative perspectives can be exploited by entities like hyperpolarized political parties and "strongly slanted media outlets" that promote "echo chambers", a trend that has already been observed in information searching patterns displayed by users in the United States and beyond (Knobloch-Westerwick, Mothes, et al., 2015, p. 505). Because of all this, it is more important than ever for educators to consider what mindsets their students might be encouraged to formulate during their time online if left unattended – especially by institutions invested in shaping their future beliefs and behaviors at any cost.

Put together, when a meaningful system of instruction is not utilized during online learning experiences, how the Web is intentionally designed (and the ways that the Web is often naturally used) can actually reinforce students' existing biases (Andes, et al., n.d.), impede their deeper exploration of complex topics, and ultimately hinder their ability to apply ill-structured knowledge meaningfully to future situations that are "ill-matched" to schemata built off their prior experiences (Spiro, 2006e, p. 4). Thus, if K-12 educators wish to create learning conditions that fulfill the Web's potential and foster a more adaptive, thoughtful, empathetic and informed society as a whole, then they cannot assume that learning benefits will automatically result from using the Web during classroom activities. Rather, they must equip students with the skills and learning mindset needed to "effectively navigate and critically evaluate the variety of sources on the Web" (Knobloch-Westerwick, Mothes, et al., 2015, p. 493).

1.4: Development of Cognitive Learning Mindset for the Modern World: Cognitive Flexibility Theory and Adaptiveness to Novelty

So how can K-12 educators account for the Web's design when planning online learning activities to promote deep learning of ill-structured and complex topics? To begin, they should be aware

of several "interrelated shortcomings" that have been discovered in students' use of knowledge or skills within ISDs when they are exposed to learning conditions that promote certain types of "schema-theoretic knowledge representation" (Spiro, et al., 1987, p. 179). First, if students develop broader maladaptive assumptions regarding ill-structured knowledge and the uniformity of its use across different contexts, such a lack of awareness of how contextual factors often impact knowledge application can stunt their deeper understanding and eventual mastery of the material being taught (Spiro, et al., 1988). In turn, when students internalize knowledge from ill-structured domains in an overly prepackaged or rigid manner, such patterns of thinking can significantly reduce the number of opportunities they perceive where such information might be relevant, useful, or applicable. And finally, if students are taught in a manner that enables excessive compartmentalization and "artificial neatening" (Spiro, et al., 1987, p. 179) of ill-structured knowledge (in a manner that occludes its inherent complexities), even when they identify opportunities to apply what they have learned, they will tend to do so in an oversimplified manner that hinders their ability to transfer such knowledge appropriately to fit the unique situational needs that they encounter. Put another way, such a flawed way of thinking about applying their ill-structured knowledge is inherently ill-suited for the density (i.e., frequency), speed and unpredictability of interactions within any given facet of modern society that continues to emerge at a rapid rate (McChrystal, et al., 2015).

Because of all this, it is critical for educators to recognize the potential harm that can come from how the Web's main features – from websites constructed in ways that promote close-ended search queries, to search engine algorithms designed around offering recommendations rather than facilitating deeper understanding, to users' tendency to utilize list-based search results in an excessively linear manner (regardless of the specific topic being explored) – can promote habits of mind and Web-based behaviors that are *artificially reductive and oversimplified* in nature. On the one hand, such features can encourage students to develop the inappropriately anti-constructivist belief that an "essential" set of information, or a single "right" answer, can be found for any topic online when, in truth, that might not actually exist *in principle* for the topic being explored (Spiro & DeSchryver, 2009). But beyond this, on a more metacognitive level, they can also promote the formation of a maladaptive schema (Schank & Abelson, 1977) that is centered around the pursuit of a predetermined "script" for navigating the Web *in itself* – namely, a script which could be described as follows: enter a specific question for a given issue (ill-structured or otherwise) into a search engine, find an "authoritative" source online to find a definitive answer (e.g., Wikipedia; Spiro, 2006e) and report said source as your justification for the "correct" answer. Put together, if such a reductive worldview is left unchecked during K-12 students' learning on the Web (especially during novice stages of learning within ISDs), they are at risk of developing a cognitive or epistemic mindset that will leave them ill-prepared to demonstrate the "readiness for learning

and performance in the complex modern world" (Spiro, et al., 1996, p. S59) that is increasingly critical for their navigation of workspaces and society as a whole (Quinn, 1992; McChrystal, et al., 2015).

In response to concerns like these, efforts have been made to promote a paradigm shift in how ISDs are taught more broadly, namely by encouraging educators to resist the temptation to "artificially neaten" curricular content (e.g., when developing learning materials or assessments; Spiro, et al., 1987). Such a shift seeks to discourage an overreliance on superficial and "'plaster-cast' knowledge structures" (a common misstep even for advanced learners) under the assumption that such an approach does not fully capture the richness and multifacetedness that is central to "*any* complex and ill-structured domain" (Spiro & Jehng, 1990, pp. 169-170). Rather, building off the metaphor of Wittgenstein's "criss-crossed landscape" that is not "fully graspable" from any single perspective, it is argued that developing learning materials (and activities) that promote active exploration of those domains' multidimensionality can help students create "highly interconnected, web-like knowledge structures" that are better equipped to be "used in many ways" just as they are "taught in many ways" (pp. 170-171). In other words, rather than inappropriately promoting the existence a set of "one-size-fits-all" facts or "scripts" for students to use across all situations, educators must be prepared to help them confront the inherent complexity of ISDs head on as a *central and essential requirement* for applying such knowledge properly. And indeed, that should extend to encouraging Web navigation that is "intellectually humble", including being willing to consider other perspectives and "take in new information" as it emerges online (Snow, 2018, n.p.).

Such a sentiment is at the core of *cognitive flexibility*, which can be defined as the ability to reassemble knowledge from various sources and prior experiences to fit the needs of "radically changing situational demands" in an adaptive and context-specific manner (Spiro & Jehng, 1990, p. 165). Such a learning mindset is intended to directly confront patterns of thinking that are diametrically opposed to the inherent complexity of ISDs (e.g., singular "representation logic", precompiling knowledge schemas as "recipes" for navigating new cases, passive "handing" of knowledge from "external authority" to learners; Spiro, et al., 1988, pp. 3-4). In their place, CFT scholars call for a mentality characterized by a "constant reflection and critique of the status quo" even in one's own worldview, a cognitive openness that can allow learners to "seamlessly" move between domains of knowledge as they ebb and flow in relevancy, applicability and form of applicability within and between situations (Ahmed, 2020, n.p.). In line with such learning goals, Dennis and Vander Wal (2010) used self-report data from undergraduate students (n = 196) to assess cognitive flexibility's ability to promote more adaptive thinking along three key dimensions (p. 244): (a) an ability to view challenging situations as "controllable" or able to be resolved; (b) an ability to consider "multiple alternative explanations" for life circumstances or the behavior of others, in a manner that can improve one's understand of how such problems emerge and how they can be solved; and (c) a capacity to "generate multiple alternative solutions", in a manner that can make one's

problem solving more adaptive and ultimately more successful. And indeed, they found that when a two-factor model was utilized (categorized under "Control" and "Alternatives", with the latter encompassing both (b) and (c)), 7-week test-retest reliability and high internal consistency supported the argument that those who demonstrate higher cognitive flexibility tend to utilize coping styles during stressful life events that are more adaptive in nature. Thus, if K-12 teachers can create learning experiences that promote a cognitively flexible mindset and eschew conceptions of ill-structured knowledge as "plaster-cast" (Spiro & Jehng, 1990) or able to be indiscriminately applied in the same predetermined way across all contexts, it could be argued that such a pedagogical approach might leave their students better equipped to properly cope with and adapt to the complexities that arise in whatever learning situations they might encounter.

Such an argument appears to also align with prior scholarship exploring literacy on the Web specifically, which has consistently noted how prior experiences (including those within educational settings) can potentially shape not only how students learn online, but also what beliefs they develop about knowledge and learning in general (DeBacker, et al., 2008; Leu, et al., 2015). In particular, by incorporating Web-based learning activities that actively encourage students to revisit, reevaluate and reuse the same information "at different times, in rearranged contexts, for different purposes, and from different conceptual perspectives" (Spiro, et al., 1992, p. 65), educators can foster a deeper understanding of ISDs that is associated with students' more effective use of such knowledge beyond the classroom. When thinking about what that might practically entail, scholars have argued that offering instruction (and evaluating students) in ways that promote indicators of complex higher order thinking and adaptive behavior (rather than mere fact retention and recall) can be critical for promoting Web-based learning experiences that are deeper and more likely to lead to successful application of concepts in future real-world contexts (Cho, et al., 2017; Wiley & Voss, 1999). And tying this back to CFT, such efforts should also be anchored to a larger mindset – an *adaptive worldview* – that embraces the inherent irreducibility and context dependence of ill-structured topics, while also maintaining a preparedness to proactively "seek out and penetrate oversimplifications" related to them (Spiro, et al., 2019, p. 959). But what might such a mindset look like for K-12 students? To name one example, Michigan's K-12 Standards for Social Studies expects high school students, among other learning criteria, to develop the ability to (p. 86):

- explain similarities and differences in experts' "interpretations and applications of disciplinary concepts and ideas" (Dimension 1);
- appropriately apply the "unique way of thinking and organizing knowledge" associated with a given discipline, including navigating "systems" used "for verifying knowledge" (Dimension 2);
- gather sources of information, for the purpose of "developing claims and using evidence" to support specific claims about particular topics (Dimension 3);

- intentionally draw information from multiple sources "to detect inconsistencies in evidence" (Dimension 3);
- come up with explanations "using sound reasoning (and) correct sequence (linear or non-linear)" (Dimension 4);
- use "disciplinary and interdisciplinary lenses" to understand the features and causes of societal problems "in multiple contexts" (Dimension 4); and
- consider options for addressing such issues through "self-reflection, strategy identification, and complex causal reasoning" (Dimension 4).

Such standards reflect an urgent call by policymakers for teachers to provide learning experiences for students that are "grounded in experience" and aimed at developing their capacity to "respond intelligently" to any "problematic situation" (Johnson & Reed, 2008, pp. 13-14). To many scholars, this highlights the need to for schools to more fully promote "21st century skills" centered on an adaptive use of knowledge (e.g., collaboration, technology integration, problem-solving, willingness to innovate, and creative thinking; Larson & Miller, 2011), since that the degree to which "collective and individual success depend on having such skills" is greater than it has ever been (Johnson & Reed, 2008, p. 17). Put another way, if students are not taught to embrace complexity and apply their knowledge in ways that go beyond what has traditionally been expected of "routine production workers, those who perform repetitive tasks", then their navigation of adulthood and even their employability are likely to be significantly hindered – a trend that has been exacerbated by various industries increasingly relying upon artificial intelligence to "take over recurring tasks" and jobs that are more "repetitive" in nature (Voogt & Roblin, 2010, p. 1). In fact, as noted by Cazzaniga, et al. (2024), roughly 60% of current jobs in "advanced" economies like the U.S. (and 40% of employment globally) are expected to face "potential disruption" due to AI in ways that could exacerbate current "wealth inequality" trends if not properly responded to (p. 2). With this in mind, building off prior research on prefigurative schemas (i.e., sets of epistemic beliefs that underpin one's understanding of "what knowledge consists of and how it should be acquired"; Spiro, et al., 1996; S53), Spiro, et al. (2019) identified ten exemplar CFT-oriented "cognitive values" central for learners' development of an adaptive worldview, one that is better suited for applying ill-structured knowledge to novel situations that cannot be predicted or planned for in a predetermined manner but are nonetheless likely to be encountered, including within future job markets on a global scale (p. 962):

a. Emphasizing cases (i.e., specific events or situations) and their multifaceted "richness", rather than the "primacy of concepts"

b. Using “multiple conceptual relations” to inform your understanding (i.e., more than one schema, prototype, analogy, perspective, etc.)
c. Treating cases as “wholes with emergent properties” that have greater meaning than the “sum of their (respective) parts”
d. Attuning one’s perception of differences (between cases), while also decreasing one’s bias toward “seeing (or seeking) similarities”
e. Expecting “unpredictability, irregularity, contingency, (and) indeterminateness”, rather than seeking to avoid or prevent them
f. Preparing oneself to revisit earlier cases within new contexts, in order to “bring out facets” of such cases that were previously “hidden” (i.e., in a manner that is nonlinear and should not be misconstrued as merely “repeating” one’s exposure to them)
g. Embracing “flexibility and openness of knowledge representation” when storing one’s knowledge
h. Stressing “context dependency” when using one’s knowledge across different situations
i. Avoiding “rigidity in understanding” in favor of being “*open*”, which is defined as appreciating the “sometimes limitless” variety of ways that knowledge can be applied “in new combinations, for new purposes, in new situations” (especially when ISDs are involved)
j. Utilizing “situation-adaptive assembly of prior knowledge and experience” to fit the needs of specific contexts, rather than depending on predetermined “retrieval of intact knowledge structures and procedures from long-term memory” to navigate them

However, there are two key points to make at this stage about cognitive flexibility and how these “cognitive values” should be understood in relation to CFT. First, as noted by Spiro via personal correspondence with the author of this study (January 16, 2022), it is critical to understand that CFT is a “single, holistic [sic]” concept that is itself ill-structured, in the sense that it cannot be described with a “single view or…definition” due to having “too many interacting parts” that are “beyond the mind’s working memory capacity” to fully grasp. Thus, CFT can only be viewed through “different perspectives, each revealing (different) *aspects* of the whole” that are “partial synecdoche(s)” that are nonetheless “interrelated/interconnected”. For example, a “value” related to *structure* or how one holds knowledge (e.g., “cognitive value” #2 in the above list) could be connected to the *process* of assembling that knowledge (e.g., “cognitive value” #10). And second, as Spiro put it, there exists an “infinite number of combinatorial theory-sentences” that could be used to describe the “interdependence of any potential set of CFT cognitive values within the larger CFT whole that is greater than the sum of its cognitive-value aspects”. In other words, there is no single definitive list of CFT “cognitive values” that exists, and the process of finding a “‘true’ and…useful” way to “slice” CFT depends on the “CFT application” at hand.

Thus, if we want to use CFT to help students develop a mindset that better prepares them to adaptively apply their knowledge, then the "cognitive values" promoted within K-12 classrooms must be centered on the considerations and needs identified for the students and educator within each unique learning context.

1.5: What Does Optimal Navigation of the Web Look Like (for K-12 Classroom Settings)?

Building off this need to promote a mindset characterized by "cognitive values" associated with non-reductive schemas and adaptiveness to novelty when teaching content from ISDs, it begs the question: how can K-12 learning environments integrate the Web more meaningfully in relation to what CFT calls for? Put another way, how can teachers successfully encourage their students to "construct more substantive and generative knowledge" (DeSchryver, 2014, p. 4) during their online learning, in terms of meaningfully deepening their understanding and more flexibly applying their ill-structured knowledge beyond the classroom? When speculating about what might be hindering effective application of knowledge within various professional contexts (e.g., libraries, legal clinics, courtrooms) even by students who performed well academically, Oates and Wineberg (1997) postulated that such an issue of transfer was caused not by poor recall of information or insufficient opportunities for practice, but rather by those students not being taught in a manner that could enable their future success in real-world settings. More specifically, building off our aforementioned discussion of ISDs being defined *in principle* by their lack of "essential" information (Spiro & DeSchryver, 2009), Oates and Wineberg recognized the need to reevaluate how students are taught to "think", in order to steer them away from a conception of knowledge as "fixed and known" regardless of subject and instead train them to "cope with the uncertainty" inherent to ill-structured subjects like English, science and social studies (p. 13).

And indeed, such a concern has to account for the mindset of educators as well, for Patterson, et al. (2012) found that K-12 educators teaching history (or social studies) can also frequently exhibit a superficial awareness of how to utilize primary source documents (PSDs) during their curricular development, namely by relying on a lower-order use of documents during lesson planning (e.g., using them for the purpose of promoting "recall, factual understanding, and narrative construction") that can potentially impede students' "higher order implementation" of them in the future (p. 80). This is important because multiple studies have found that developing a more advanced learning approach is critical for students' future ability to learn and apply their knowledge in ways that indicate "higher order" thinking about the ill-structured topics that they are being taught. For example, such discipline expertise has been associated with more intentional consideration of document type (e.g., textbook, historian essay, participant account, opinion article) when evaluating a source's trustworthiness (Rouet, et al., 1996); greater consideration of varying perspectives or interpretations regarding historical events, rather than

following the impulse to determine which point of view is "right" (Rouet, et al., 1997, p. 97); and heightened recognition of the impact of complex political contexts when identifying causes of major historical events, rather than solely focusing on intentional factors like individual actors' motives (e.g., Columbus's and the Spanish royalty's motives during the discovery of America; Carretero, et al., 1994). Put together, by promoting a cognitively flexible mindset that includes both awareness of the "specific forms of discourse" available and how to utilize such information as "evidence when solving problems", K-12 educators can be better situated to help their students begin to deepen their understanding and more intentionally and effectively apply their historical knowledge – even when students possess "very little initial knowledge of the particular situation or problem" being discussed (Rouet, et al., 1997, p. 104).

In line with such reasoning, when identifying what would reflect optimal Web navigation by students learning within K-12 classrooms, one avenue explored in prior research that could be useful to consider involves how learners identify sources of knowledge that are potentially useful, as well as how they comprehend and use such information during their online learning sessions. For decades, literacy scholars have acknowledged that greater awareness of (and willingness to consider) different types of informational text structures can help students improve their recall of textual information (Bartlett, 1978; Meyer, et al., 1980; Taylor; 1980), making knowledge of content and text structure "naturally intertwined" in a manner that reflects the relevancy of both when promoting deeper learning (Duke & Pearson, 2009, p. 112). Applying such a sentiment to the Web, Coiro & Dobler (2007) highlighted four primary sources of information that are drawn upon by skilled online readers: two that are utilized when reading *printed text* in general (prior knowledge of topic and printed informational text structures) and two that are unique to *Internet text* (prior knowledge of informational website structures and Web-based search engines). The former category of sources facilitates readers' location of pertinent information in more generic ways, such as providing useful background information (e.g., topic-specific facts or vocabulary) and indicating where other relevant texts might be located (e.g., signal words, bold or italicized text, use of headings). But just as importantly, the latter signals how to find relevant information on websites (e.g., use of hierarchical and nonlinear hyperlinks; negotiation of homepages or interactive media) and how to manage one's browsing techniques effectively (e.g., choosing appropriate keywords; critically evaluating search results). And indeed, literacy research focused on the Web has repeatedly noted the unique learning benefits associated with developing knowledge about Internet texts and how to navigate them properly. For instance, higher online reading comprehension skills can compensate for lower amounts of topic-specific prior knowledge (Coiro, 2011), and engaging in more direct and goal-directed Web navigation (i.e., discerning whether or not specific Web pages can enhance one's understanding) tends to foster more successful online learning outcomes (e.g., concept recognition during true/false assessments, differentiating reliable and unreliable websites; Goldman, et al., 2012).

Thus, when teachers integrate use of the Web into their K-12 instruction, simply offering access to the Internet or digital texts during learning tasks (e.g., providing students laptops with Wi-Fi; using Google Classroom for submission of homework assignments) is not enough to ensure optimal Web navigation, especially in light of the Web being characterized by ever-increasing complexity and the ongoing threat of exposure to misinformation or polarization within digital spaces. Rather, it must be a priority for them to teach students how to be *skilled* online readers and learners, in terms of not only evaluating the authoritativeness or reliability of different websites, but also using different forms of critical evaluation (e.g., ignoring advertisements, evaluating readability of specific texts) to adaptively discern which websites will be beneficial for their specific learning goals (Zhang & Duke, 2008). But beyond this, it is also critical for educators to offer their students the opportunity to create new knowledge by integrating and/or finding unique connections between the different sources of information that they encounter during their time spent online. With the latter concern in mind, DeSchryver (2014) emphasized the merits of promoting *web-mediated knowledge synthesis*, a form of higher order thinking that moves learners "away from simple information consumption and toward more complex knowledge generation" (p. 4) that reflects greater use of cognitive flexibility and adaptiveness during one's exploration of ill-structured topics. DeSchryver envisioned such cognition emerging in two particular forms:

1. *synthesis for meaning*, which entails formulating a deeper understanding of both the *explicit* and *implicit* meaning of texts, thereby helping readers better understand and thereafter cognitively structure the knowledge that they obtain from different information sources; and
2. *generative synthesis*, which entails the development of knowledge that is *neither explicitly or implicitly alluded to* in the texts that readers encounter (in a manner that can sometimes occur in a single isolated moment, and in other instances over an extended period of time).

Building upon such rationale, when DeSchryver conducted purposive sampling with advanced Web users to concretely ascertain how these forms of synthesis might be manifested in Web-mediated learning contexts, subsequent data analyses revealed seven distinct Web-based skills that were displayed:

1. *use of keyword search phrases*, including "words or phrases not provided in the task" (p. 18), to guide the process of searching for and constructing knowledge during Web-based learning;
2. *synthesis for meaning*, which accounts for the ways online readers organize, arrange or structure text when collecting information in order to obtain or find meaning;

3. *in-the-moment insights*, which involve one's ability to spontaneously gain insights from a combination of Web resources and Web-based activity, often in a manner that merges seemingly "isolated pieces of information into a unified whole" (p. 19);
4. *repurposing*, which consists of the effort to alter or transform ideas encountered in particular online texts to appropriately fit the needs of new contexts or situations (including Web-based ones), often in a manner that can ultimately lead to acquiring further meaning for those ideas;
5. *reinforcement*, which involves online readers' tendency to reencounter or reevaluate ideas after they have already been synthesized, which can come from simply considering "a different perspective" or from assessing a given idea's (or set of ideas') fit within a new context (p. 19);
6. *note-taking*, which consists of not only how much information students directly pull from the online texts being read, but also how linear the notes themselves are (which can be affected by whether notes are taken offline, on the computer, or a combination of the two); and
   creative synthesis, which can be defined as a task-driven combination of the six aforementioned synthesis-related skills, a process that is generally iterative in nature and often utilizes multiple sources of information for a given situation (e.g., prior knowledge, Web-based texts, idea-play).

In light of such observations and other empirical findings (DeSchryver, 2012), DeSchryver (2017) conducted a case study involving a single doctoral student's completion of tasks aimed at informing her perspective (i.e., "reading-to-learn") and brainstorming potential courses of action (i.e., "reading-to-do"), in order to more closely examine how the first six skills from the aforementioned list could work together to support "*creative synthesis* of knowledge about ill-structured topics" while navigating the Web (p. 240). These tasks were designed to be (a) ill-structured, in terms of there not being a single "right" answer or approach to the tasks; (b) generally interesting but focused on topics uncommon enough that the student would likely have limited prior knowledge of them; (c) dichotomous, such that multiple schools of thought about the topics could be identified; and (d) "Wikipedia-unfriendly," or written in such a way that searching key words "based on the task language" would not lead to seeing the website "in the first page of Google results" (p. 243-244). Under such conditions, upon close examination of the participant's think-aloud audio, screen-recording video data and interview data, DeSchryver found that her process of "synthesizing information in Web-mediated environments" was highly unpredictable and thus "itself an ill-structured concept" (p. 260-261) – thereby suggesting that learning tasks can be designed and implemented in a manner that *by their very nature* empower students to become more sensitive to the demands inherently involved when applying ill-structured knowledge to complex situations. Collectively, these findings suggest that in order for K-12 classroom settings to use the Web to its fullest potential (especially for learning within ISDs like history), educators should provide instruction that not only incorporates a cognitively flexible mindset to enable deeper learning and more situationally

adaptive use of knowledge, but also encourages students to properly navigate the Web's nonlinear nature (and build their understanding of it) in order to avoid the temptation of utilizing search results or digital content in a cursory, passive or predetermined manner (DeSchryver & Spiro, 2008).

1.6: CFT's Solution for Challenges of Online Learning: LICRA's Potential in Enabling Optimal Web Navigation

For decades, Web users have grappled with the question of how to retrieve "the most information rich" pages possible during their online queries, given the impossibility of recalling all the potentially "relevant pages" that they encounter (Kobayashi & Takeda, 2000, p. 150). But there is an inherent risk of students feeling overwhelmed in nonlinear hypertext environments like the Web (Spiro, et al., 1992), particularly since computer-mediated communication systems tend to suffer from a heightened degree of "social density" or "connectivity" that can cause information overload unless "certain structural design aspects of the interaction space are optimized" (Hiltz & Turoff, 1985, p. 682). Indeed, even when learning about situations or topics that are "non-crisis" in nature (Hiltz & Plotnick, 2013, p. 824), learners interacting with search engines and other Web-based environments (especially those that are algorithm-driven, like social media) often struggle with "information saturation" – that is, the immense challenge of navigating and "effectively indexing" the countless array of documents, websites, posts and media uploaded (or updated) online on a daily basis (Palanque & Paternò, 1998, p. 262). In fact, prior scholars like Lee and Chiou (2016) have recommended that Web users wishing to manage the "double edged sword" of online searching, in terms of making themselves more fully informed about a given topic without incurring the risks of inferior decision-making as a result of "excessive searching", should "limit the number of options" that they inspect in a given "rank-ordered" search query to "ensure maximum benefits" (p. 9). Because of this, it is understandable why K-12 educators concerned about their students feeling overwhelmed on the Web (or to their being exposed to misinformation or "bad actors") might instinctively believe that narrowing students' focus to the "right" sources or websites during online learning activities is appropriate when covering complex or controversial topics in their classrooms.

However, it is important to remember not only students' natural tendency to display patterns of Web-based search queries that become "more passive and more eclectic" over time (Cothey, 2002, p. 77), but also algorithmic search engines' personalization of search results in ways that can become "diametrically opposed" and "increasingly biased" – which can (and often does) evolve into the Web acting as a "one-way mirror" to reinforce users' preexisting views (Pariser, 2011, Introduction). And when students use the Web beyond the classroom, it cannot be assumed that they will always have an educator or teacher near them to support the depth and quality of their learning about the topic at hand. Because of this, teachers are unlikely to foster optimal learning outcomes or benefit their students'

trajectory as learners long term (including during their navigation of the Web) if they oversimplify or fail to address the complexities involved when trying to find relevant information online (especially for ill-structured subjects like history that *in principle* lack information that is "essential" for all cases; Spiro & DeSchryver, 2009). On the contrary, if we accept DeSchryver's (2017) premise that Web-based learning is "itself an ill-structured process" (p. 260-261), then activities within K-12 classrooms that fail to account for such an consideration (e.g., by listed the "right" websites to read for a specific assignment) could actually have the opposite effect by enabling the development or reinforcement of more maladaptive learning habits that ultimately hinder students' future use of the Web for advanced learning purposes more broadly (Spiro, et al., 1988). Therefore, rather than avoiding or minimizing the complexities inherent to navigating the Web, teachers should aim to incorporate a "suitable theory of learning and instruction" (Spiro, et al., 1992) that not only confronts but actually embraces the depth of nonlinear exploration and non-rigidity that is possible within hypertext-based learning environments like the Web.

But when thinking about how students can be encouraged in K-12 classroom settings to approach learning on the Web in less rigid and more cognitively flexible ways, there are several key considerations that are important to note for implementing such a system of instruction successfully. First, while it is important for teachers to explicitly acknowledge the nature and potential pitfalls of using the Web for learning purposes, their curricular adjustments must avoid the trap of "compromising search engines' commercial competitiveness or students' information opportunity" during learning activities (Salehi, et al., 2018, p. 10). Put another way, emphasis should be placed on explaining the affordances and hindrances of online learning and offering guidance on how to navigate the Web more effectively, rather than assuming that it is a "practical solution" to simply discourage students from using search engines altogether (p. 10). Second, since search engines offer a variety of options for customizing or refining queries that many K-12 students are likely unaware of (e.g., using quotations to find results with exact phrases), such instruction should not shy away from offering students the chance to practice using "advanced search features" that might prove "indispensable" during their efforts to conduct higher-quality Web search queries within future academic or professional settings (Lewandowski, 2005, p. 145). Finally, to combat the ongoing risk of information overload in an environment as inherently complex and nonlinear as the Web, any Web search strategies introduced in K-12 classrooms should, from the outset, seek to incorporate "meta-cognitive and…utilization strategies" that can help students "manage cognitive load" and construct their knowledge in ways that support deep learning (Shrivastav & Hiltz, 2013, p. 7).

With such considerations in mind, DeSchryver and Spiro (2008) recommend that students apply a CFT-based learning mindset (i.e., a mode of learning specifically aimed at applying CFT principles) by conducting *learner-initiated, complex, reciprocally adaptive (LICRA) searches* while navigating the Web to deeply explore ill-structured topics. Each facet of this concept warrants further clarification at this

point. First, when a Web search query is *learner-initiated*, it means that the user is actively changing their use of search terms (or search engine features) to engage in deeper exploration of a given topic, rather than solely relying on what a search engine like Google lists or what is listed as relevant or "essential" to know by a source regarded as the authoritative or "right" one (e.g., using embedded hyperlinks at the bottom of a single Wikipedia article). Put another way, LICRA promotes learners taking responsibility for what they search for online, as opposed to passively allocating that responsibility to search engine algorithms or whoever adds content on a particular Web page. Second, if a user's Web searching is *complex*, it indicates that trains of thought are being pursued that can go in numerous directions (e.g., sideways, backwards, exploring multiple paths simultaneously). Such an approach capitalizes on the Web's nonlinear design by enabling students to consider different ideas and perspectives (either individually or alongside each other) and spot potential connections between them, in an unencumbered manner not limited or oversimplified by relying on a strictly linear method of processing and evaluating information. For instance, rather than just reading from the top of a given online article to the bottom, someone engaging in LICRA could (a) use the "Back" button to reread a paragraph from a previously-encountered Web page (e.g., to reexamine a relevant fact or quote) before resuming their reading of the article; (b) follow a hyperlink offered in the article to further explore a current event or concept that is mentioned (i.e., an example of moving "sideways" in one's Web exploration); or (c) open a "New Tab" to read another article at the same time (e.g., to compare the two authors' differing perspectives on the topic being discussed). Finally, *reciprocally adaptive* refers to a form of dynamic interaction that can potentially emerge between the user and the Web search engine that they use. During such a query, after a search is initiated by a given learner, then the Web "listens" to what is asked for by "responding" with results that correspond to what the learner requested. In turn, the learner learns from and "responds" to the Web by basing the next cycle of their Web exploration (e.g., which search terms they use), at least in part, on what the Web has revealed to them – ultimately allowing a cyclical sort of collaboration and reciprocal influence between the learner and the Web to emerge.

In sum, LICRA Web searches are meant to put students in a better position to navigate the Web in a manner that is both "maximally unfettered and externally oriented" (p. 4) on a consistent basis. In other words, LICRA discourages an overreliance on predetermined notions (e.g., using a list of hyperlinks or websites chosen beforehand) or "top-down" guidance from the Web (e.g., sequentially looking at a single set of search results from Google) to determine what might be "useful" to learn or explore. Instead, it calls on learners to plan the next steps in their Web exploration *in direct response to what they actually encounter* (e.g., incorporating ideas or information on a certain Web page into searches subsequently undertaken), thereby empowering them to take more active control of their online learning experiences. And indeed, instilling such a Web-based learning mindset could prove to be beneficial in several

meaningful ways. To begin, building off Gerhart's (2004) sentiment that even controversial or complex topics can be "well represented on the Web in search results posed with the right query" (n.p.), teaching such a Web search strategy could provide a more tangible and less overwhelming way for students to identify, explore and consider perspectives that otherwise might be overlooked or underexplored during their online navigation. Second, by offering an approach to the Web that is more learner-initiated and thus less passive in nature, students can be primed to be more critical of the search results or websites that they encounter by default – which can thereafter help them be less susceptible to misinformation online in the future, especially within hyperpolarized online spaces or "echo chambers" (Knobloch-Westerwick, Mothes, et al., 2015). Third, while DeSchryver and Spiro (2008) acknowledge that LICRA searches require higher *germane* cognitive load due to their "iterative nature" (p. 11), they also note that such expenditure of effort can promote heightened attention, increased satisfaction and more frequent self-determined value determination during Web exploration. Such cognitive shifts could arguably play a role in mitigating confirmation bias by motivating students to more consistently "'check' themselves" and critically evaluate how they read sources and consume media (Wittebols, 2016, p. 8). And finally, if utilizing LICRA Web searches can encourage students to create knowledge structures that are not only more "personalized" but also more adaptable to the unpredictability found in real-world situations, that could help them avoid long-term issues related to advanced knowledge application that can stem from more "passive transmission(s) of knowledge" during novice stages of learning (Spiro, et al. 1988, p. 377). Overall, by using LICRA searches to promote more active and critical engagement with the Web during online learning (especially during instruction involving ISDs like history), K-12 educators can help their students refine their use of cognitive flexibility and assemblage of ill-structured knowledge in ways that empower them to more effectively apply what they learn in future situations both online and offline.

1.7: Potential Indicators of Complexity and Adaptive Worldview during Web Navigation in K-12 Classrooms

But if education researchers want to discuss with collaborating K-12 teachers how LICRA could be used to promote the use of CFT-oriented "cognitive values" (and deeper learning more broadly) during online exploration of ill-structured topics within their classroom settings, then that naturally begs the question: what indicators could be used by them to determine whether or not their students are navigating the Web (or preparing to do so) in an "optimal" way that demonstrates more complex thinking and an adaptive worldview that is better suited for responding to novelty? As noted by Clemente (2018), building off the importance of a cognitively flexible mindset for deeper learning of ISDs, it is critical to consider not only the specific online behaviors that students display, but also their thought processes both "*before* and *during* their interactions with (the Web)" (p. 21). Put another way, it is important for teachers

to ascertain the degree of complexity and/or adaptiveness being displayed in the *patterns of thinking that underpin their students' Web behaviors* (e.g., how they plan their Web exploration to complete an assignment; what factors they use to decide whether a specific website is useful for their learning about a given topic), as well as any dimensions of their "prior experience" that seem to influence their reasoning (e.g., epistemic beliefs related to learning on the Web, any topic-specific knowledge they hold pre-task).

But how might teachers do so? Such a sentiment calls for two critical considerations. On the one hand, building off Spiro's (2006e) efforts to note the limitations of using close-ended Web searches to foster deep learning, just because students are thinking about where to go online *does not* necessarily mean they are doing so in a *higher order* manner (e.g., avoiding passive acceptance of what Google lists; actively thinking about which search terms might be most useful), nor does it guarantee that they are learning in ways that foster complex understanding or adaptive application of knowledge related to the topic(s) being explored. And in a similar vein, just because students are altering their search terms does not mean that they are doing so in a way that reflects complexity in their thinking (or corresponding behavior). Rather, their thinking *and* Web navigation need to both be derived from a rational response to what has already been encountered on the Web in relation to their learning goals. In other words, during Web navigation, students should be thinking and acting *in direct response* to what the Web reveals to them, and in a manner that is relevant for "deepening their understanding of the topic at hand" (Clemente, 2018, pp. 27-28). With those points in mind, Clemente (2018) identified several forms of complex and adaptive (i.e., higher order) thinking that might occur during online learning, including (pp. 22-24):

- *Awareness of multiple causation*, or the possibility that "a single event can have multiple causes" (e.g., a runner can suffer cramps during a long-distance race due to both abnormally "hot weather" and the runner being dehydrated).
- *Understanding of the interaction and interlocking of multiple causes*, since multiple causes can also "reciprocally influence…each other" (e.g., a "lack of water" can exacerbate the effects of heat, and the weather getting hotter can result in "faster dehydration" and greater need of water).
- *Recognition of the contextual impact of factors*, or the fact that "the impact of particular causes" can depend on the situation at hand. For instance, it could be argued that runners will be more vulnerable to dehydration "on a hotter day than on a cooler day".
- *Recognition of conditionals*, or what might make "the connection between certain causes and certain effects" stronger at some points in time than at others. For instance, why does a runner experience cramps on one hot day, but not on similarly hot days in the past?
- *Acknowledgement of degrees and "grey areas"*, since relying on oversimplified or "'black-and-white' narratives" too dependent on "prior experiences" can lead to missing key details in novel

situations. For instance, the cramping runner might have a history of not drinking enough water, but it should also be noted whether the race made water readily available for the runner to drink.

- *Consideration of multiple perspectives*, in terms of not only "understanding the *different types* of perspectives that can be formed" but also how they might be connected to each other in a particular situation. Examples of such perspective-based considerations include the following:
    - Perspectives of "opposition", in terms of having different opinions on a given issue (e.g., runners who believe that stretching before a run is good for preventing cramps vs. runners who believe such pre-run stretching might actually risk serious injury).
    - Perspectives of "gradient", in terms of noting the degree of impact of a given cause (including issues of "context and conditionality"). For instance, you could say that the runner's cramps were due to not drinking water, minimize the that issue by focusing more on run length, or argue that the weather had more impact on the risk of dehydration.
    - Perspectives of "'grain size' or level of examination" (e.g., focusing more on the habits of the runner as an individual vs. examining what issues runners of a similar age, gender and/or physique tend to display or struggle with while running).
    - Perspectives focused on "singular sectors or dimensions of societal function". For instance, from an economic perspective, one could ask if the runner's ability to buy new shoes or running gear (e.g., wearable water pack) affected his susceptibility to cramps.
    - Perspectives focused on "national, regional and/or cultural identity" (e.g., from a cultural perspective, one could ask whether the runner's setbacks are partly due to living in a country characterized by a more sedentary day-to-day lifestyle).
    - Perspectives focused on deductively "using overarching theoretical frameworks to interpret 'lower level' information" (e.g., using one of a number of theories related to stretching to offer the runner recommendations to avoid future cramping).

Building upon such rationale, Clemente postulated that higher order schemas that embrace complexity and heterogeneity of perspectives in such adaptive ways could potentially be "connected *with each other* to create new, even more complex schemas", and that such efforts could eventually foster the creation of "habits of mind" that shape learners' acquisition of ill-structured knowledge even beyond the Web or the specific topic being explored (pp. 10, 24). Put another way, building off Einstein's conception of "combinatorial play" as the "essential feature in productive thought" (Popova, 2013, n.p.) and the sentiment that the "ultimate goal is not truth but understanding" (Fowles, 2014, n.p.), by emphasizing the importance of *how to think* about ill-structured topics (and how to use such thinking to direct one's Web navigation), K-12 teachers can help their students' thinking becoming *intrinsically* more

complex in ways that have the potential to fundamentally shift not only how they navigate the Web to gain a deeper understanding of the topic(s) being taught, but also how they learn and apply knowledge within ISDs on a broader scale that extends beyond the teachers' classrooms and even into adulthood.

To illustrate how this might emerge within K-12 classrooms, let us cite a previously-used example of how a "hypothetical online learner" might display "higher order" thinking while exploring an ill-structured history topic on the Web – specifically, the causes of WWI (Clemente, 2018, p. 25). An early sign of complex thinking a teacher might notice for that particular student (let's call them "Learner A") is if they start to show greater openness to different perspectives (as reflected on different websites) when trying to understand what started WWI, rather than seeking an oversimplified narrative or a single "right" cause. That might come in the form of not just finding out which countries were in political conflict, but also learning about how "each country's economic issues" may have played a role (p. 25). From there, the teacher could encourage Learner A to consider how those causes might be interconnected, such as pointing to the impact of the British blockade of food and raw materials from Germany and Germany's alliance with Austria-Hungary against Serbia to raise the question of whether "Britain was allied with Serbia" and if that may have "led them into the war" (p. 26). But it could be argued that such inferences were made apparent to Learner A from their interaction with the teacher (i.e., before seeking information online), so it would also be important for the student to be able to show "logical progression in (their) thinking" (p. 27), namely by demonstrating which ideas direct their *subsequent* use of the Web. For instance, if Learner A thereafter explores whether these economic issues "serve(d) as a major cause of (Britain and Germany's) political strife" by intentionally using a search query like "Britain AND France AND economic conflicts" to explore the idea further (p. 27), the teacher could note their display of complexity in their thinking (e.g., considering *how* these different causes might have logically influenced each other) *and* Web navigation (e.g., building off changes in one's topic-specific understanding to adjust their use of search engine functionality). And if we tie scenarios like this one back to LICRA's aim to promote a dynamic relationship between learners and the Web, it highlights how teachers can begin to better situate themselves to guide the thinking and online behavior of their students to *reciprocally influence each other* – such that they begin to display more complex thinking and adaptiveness not just when learning about specific topics like WWI, but also when they navigate novel situations more broadly!

Put together, the hypothetical relationship between Student A's emergent higher order thinking and their corresponding Web navigation shows how K-12 educators could use pedagogical strategies like integration of LICRA web searches (and development of corresponding assessments) to thoughtfully promote a CFT-oriented worldview in their classrooms, one that goes beyond mere regurgitation of facts in favor of thoughtfully considering and connecting different ideas in a nonlinear and non-reductive manner that promotes deeper learning of ISDs. However, for the pursuit of this teaching goal, several

words of caution must be briefly acknowledged at this point. First, building off the measures of human functioning provided by Fox and Maggioni (2016), it is important to not only consider students' *ability* to think and navigate the Web in complex ways, but also their *willingness* to do so (e.g., the attitudes they display towards shifting their learning mindset). Second, the emergence of complex thinking often occurs in a graded manner; and thus, assessing students' thinking by using a categorical approach (i.e., either it *is* complex or it *is not* complex) could itself be regarded as a gross oversimplification of how human cognition evolves over time (especially for younger learners). And third, as demonstrated by the above example's citing of Learner A's evolving mindset at different stages, it will be important for teachers to identify ways to assess and respond to students' in-the-moment thinking (rather than relying on post-task reflections that entail imperfect recollection of past thinking), in order to accurately monitor *the degree to which* alterations in their patterns of thinking actually align with any changes in their Web behavior.

1.8: Rationale and Key Context-Based Considerations for Exploring Integration of CFT (and LICRA) Within K-12 Classroom Settings

Even as findings from prior research indicate how CFT (and LICRA) might be utilized to foster noticeable shifts in learners' patterns of thinking and navigation of the Web, several reasons have also been identified to justify exploring the impact of integrating CFT principles (and corresponding Web-based learning activities) into K-12 classrooms, particularly those teaching history (or social studies). To begin, when laying out their expectations for K-12 educators, policymakers have increasingly emphasized the need for "young people" to develop "knowledge, skills, intellectual processes, and dispositions" necessary to "make informed and reasoned decisions for the public good" (Michigan Department of Education, 2019, p. 3). With that in mind, they have cited such an understanding of history as being integral to the very "purpose" of learning the subject, while also deeming the learning of it to be a "responsibility" held by all people *in principle* due to their being "members of a culturally diverse, democratic society in an interdependent world" (p. 3). And indeed, concerns have been recently raised about the real-world implications for young students not being given the opportunity to learn history in such a manner, from their being vulnerable to misinformation campaigns that can play a role in "revers(ing) progress made in diversity and racial equity" (e.g., legislative suppression of Critical Race Theory; Alfonseca, 2022, n.p.) to their being ill-prepared to stay "on top of shifting news" related to historical events unfolding in real time (e.g., the Russia-Ukraine crisis; Schwartz, 2022, n.p.). In addition, from a theoretical standpoint, according to New Educator (2002), CFT scholars like Rand Spiro have long noted that when teaching subjects like history that frequently involve the emergence of "multiple perspectives and even competing contexts and facts", promoting cognitive flexibility "can allow students to gain a deeper understanding" that also leaves them better equipped to meaningfully respond "when the

world doesn't involve a steady, predictable routine" (n.p.) – a state of existential unpredictability that K-12 students (and humanity at large) are being forced to navigate on a day-to-day basis at much higher rates than previous generations (McChrystal, et al., 2015). And third, while prior research examining use of CFT principles for online learning has generally stuck to advanced learners pursuing collegiate or postgraduate degrees (e.g., DeSchryver, 2017, Clemente, 2018), K-12 students are generally in a more novice stage of learning about ill-structured subjects (Spiro, et al., 1988) and likely have less experience navigating the nonlinearity of the Web in a higher order manner (Spiro, et al., 1992). So it could be argued that they might reap even greater benefits from being introduced to CFT principles at an earlier age, in relation to both deeply learning about complex historical events and using strategies like LICRA to more thoughtfully explore such topics on the Web. Thus, learning more about how CFT might be integrated into K-12 history (or social studies) instruction seems to have both empirical and societal merit.

However, given that much of the preceding body of CFT/LICRA research has been conducted within laboratory settings or during peripheral curricular activities with advanced learners, multiple points of caution must be noted when reflecting on how CFT might be meaningfully utilized to teach history within the *specific learning context* that K-12 learning environments provide. First and foremost, it is worth explicitly acknowledging that students do not grow up in a vacuum, nor do they come into K-12 classroom settings with the same lived experiences. As noted by Dewey (1938), students can vary in how "relatively immune" (p. 37) they are to certain classroom-based stimuli, such that some might display a less engaged response to them largely due to preceding life circumstances. In other words, in line with Schank & Abelson's schema theory and the notion that a person's mental "scripts" develop over time, a student's previous experiences *before* entering a given classroom (e.g., coming from a certain background or culture, forming a preexisting level of interest in a particular career or topic) can affect their outlook on learning itself and the types of instruction that they will respond positively, negatively or neutrally to. And indeed, such a factor has been found to noticeably shape K-12 students' digital literacy (and how they respond to Web-based learning opportunities) on multiple levels. On the one hand, Leu, et al. (2015) found that even after controlling for pretest differences in offline reading/writing ability and prior knowledge, a significant achievement gap still exists for online reading based on income inequality (i.e., favoring economically advantaged students). But beyond such performance outcomes, variations in prior experience can also shape students' views of knowledge and learning (DeBacker, et al., 2008, citing the model by Schommer, 1990), including the nature and origin of knowledge (e.g., how complex it is, if it is derived from "omniscient authority or personal construction"), how "certain or tentative" knowledge is, and the nature of learning itself (e.g., if it is true that "learning either happens quickly or does not happen at all"). And even further, as pointed out by DeSchryver (2014, p. 3), scholars have also begun to formulate strikingly divergent opinions regarding the potential impact that *exposure to the Web itself* can

have on students' learning even before they enter a given classroom setting – with some noting the Web's potential as a "primary information resource" that can allow learners to exert greater time and mental energy toward "higher order thinking" (e.g., Anderson & Rainie, 2010), others raising concerns about how the Web can have detrimental effects like hindering focus and enabling superficial information seeking strategies that "puts 'efficiency' and 'immediacy' above all else" (e.g., Carr, 2008, n.p.; 2010; Kuiper, et al., 2005), and others still recognizing the impact of whether schools regard the Web as "merely a tool or an information resource" (e.g., Schrum, 2005; Thieman, 2008; Kuiper & Volman, 2008). In response to such concerns related to students' preexisting epistemic beliefs, Spiro, et al. (2019) presented a *four-stage model* (citing Spiro, et al., 2007) for supporting a worldview change for learners, irrespective of their prior experiences or Web use, to one that is more receptive to complexity (p. 963):

a. Demonstrate to learners that they have a reductive worldview, namely through "creating situations that make it salient", since they can often remain unaware of the epistemic beliefs or patterns of thinking that they hold and/or use unless they are pointed out to them;
b. Show how their holding such a reductive worldview is maladaptive for them (i.e., in relation to both their learning and ultimately their navigation of complex real-world situations);
c. Introduce the adaptive worldview as an appropriate alternative way of thinking, particularly in terms of its usefulness for helping one avoid the pitfalls of a reductive worldview; and
d. Explain how to meaningfully use or apply an adaptive worldview (e.g., when conducting LICRA Web searches for learning purposes), while also offering support to facilitate mastery.

Put together, any CFT-oriented instruction aimed at students in K-12 classrooms must account for individual differences that they possess *beforehand* (e.g., their outlook towards knowledge and learning, including on the Web). Namely, teachers must ensure that any pedagogical strategies that they implement provide the individualized scaffolding needed to help each student take their own necessary steps toward developing a less reductive mindset towards learning (both online and offline) and ultimately becoming more "immune" from the temptation to explore complex historical topics in an oversimplified manner.

In line with such reasoning, in order to appreciate what it might take to incorporate CFT principles (and CFT-oriented Web navigation strategies like LICRA) into K-12 classrooms in such a manner, it is also important to recognize the multitude of factors that K-12 teachers themselves need to account for that cannot be fully captured by research in laboratory settings (e.g., Coiro & Dobler, 2007). First, beyond shaping students' views on knowledge and learning more broadly, differences in prior experiences can also shape how students might respond to specific learning activities, including online. For instance, Cho, et al. (2017) found that variations in students' epistemic stances can have a noticeable

impact on their Web-based learning, with successful online learners more consistently engaging in higher order behaviors (e.g., critical evaluation of sources, self-monitoring) and less frequently displaying patterns of Web navigation that are surface-level or disconnected in nature. Thus, when designing their curricula (e.g., methods of instruction, learning activities, offering of feedback), K-12 teachers must be prepared to account for a wide array of learning mindsets that their students might possess (e.g., whether or not they believe in "quick, all-or-none learning"; Schommer, 1990, p. 499), especially when their teaching involves ISDs that cannot be adequately applied through fact recall alone (Wiley & Voss, 1999). Second, while teaching the rationale and meaningful features of CFT has been found to facilitate transfer of CFT-aligned patterns of thinking to novel learning situations even for adult learners (e.g., professionals working in transfusion medicine; Jonassen, et al., 1992), building off cognitive load theory, it is important to recognize the heightened degree of "mindful engagement" that such a mindset requires due to the germane load inherently involved (including during the use of LICRA; DeSchryver & Spiro, 2008, p. 8). Thus, K-12 teachers must not set their expectations too high for Web-based learning activities that incorporate CFT principles, lest their younger students become easily overwhelmed during their efforts to grapple with the complexity of a given ill-structured topic or even the Web itself (Spiro, et al., 1992). Rather, teachers have often been encouraged by CFT scholars to identify strategies that can help make internalizing the learning mindset *easier and more manageable* for students. For example, Spiro, et al. (2019) suggests that teachers seeking to keep their students from oversimplifying an ill-structured concept could try sharing a catchphrase or "mantra" for them to use as a self-reminder (e.g., "it's not that simple", "it depends"), in order to balance introducing the notion of being non-reductive with prioritizing a "non-technical" and "jargon-free" approach to make such a sentiment easier to grasp and internalize (p. 963).

Third, in contrast to prior CFT/LICRA research within laboratory settings that sought to control for learners' prior topic-specific knowledge (e.g., Clemente, 2018), K-12 teachers introducing learning activities that integrate CFT principles will have to proactively account for how their pedagogical strategies might be affected by students knowing either *too little* about a given topic (i.e., hindering their ability to know where to start their Web navigation) or *too much* about it (i.e., enabling them to develop overconfidence in their preexisting level of understanding). And fourth, it is worth noting that certain instructional features – such as use of real-world cases to show "conceptual variability" or avoidance of "reductive definitions" of complex concepts – can be utilized to help students *incidentally* (i.e., through interaction with the learning context itself) develop some of the "cognitive attunement" needed to meaningfully learn about and ultimately apply ill-structured knowledge (Spiro, et al., 2019, p. 964). However, it is critical for K-12 teachers to also give their students a clear sense of direction (e.g., by offering concrete directions to follow on an assignment) regarding *how* they can apply non-reductive thinking during their learning activities, especially while navigating the Web. For instance, in order to

give students a sense of how to monitor their overt online behaviors more effectively, teachers could introduce Cheng's (2015) three-level model of Web navigation, which denotes three levels of planning Web behavior that can influence each other in a reciprocal manner during one's online learning (p. 6):

1. a "global plan", which is tied to the learner's overall "purpose of reading" or exploring the Web (i.e., Level 1, defined as the most general learning goals);
2. "local plans" which are associated with accomplishing specific goals that are situated "within the larger (global) task" being completed by the learner (i.e., Level 2); and
3. "specific search plans", which shape how search queries are planned and implemented to accomplish particular "local plans" (i.e., Level 3, the most task-specific learning goals).

To give a sense of how this might look, if the aforementioned Learner A is asked use the Web to learn more about WWI for a classroom assignment, then their Level 1 "global plan" might be "identifying the causes of WWI", their Level 2 "local plans" might involve (at least in part) "exploring the relationship between Germany and Britain's economic conflicts and their political strife leading up to WWI", and their Level 3 "specific search plans" might include "typing 'Britain AND France AND WWI AND economic conflicts' into Google". But what is critical to add here is that Learner A's teacher would play a vital role in that scenario, namely through their efforts to clearly explain how Learner A's planning of their Web navigation and the quality of their thinking can have a reciprocal influence on each other.

Put together, whether we are considering the impact of K-12 students' lived experiences on their emerging learning mindsets or how K-12 teachers must be prepared to adaptively navigate such differences in student mentality (e.g., variations in preexisting knowledge or motivation to learn) with every new group of children they are responsible to teach, there must be an appreciation for the inherent challenges and complexity that would be added when moving CFT/LICRA research from laboratory settings to the "reality" of authentic K-12 classroom settings. And for such a stage of CFT scholarship, building off Patterson, et al. (2012) reporting that history teachers' use and presentation of primary source documents (PSDs) can significantly affect their students' future ability to evaluate and apply them in a higher order manner, education researchers cannot afford to overlook the vital role that K-12 teachers would inevitably need to play in ensuring the meaningful translation of CFT principles into practice. On the contrary, they must make it a priority to more fully respect teachers as reliable "sources of knowledge and wisdom" (Englert, et al., 1998, p. 261) – not only in exploring what pedagogical strategies might be used to implement CFT-based instruction effectively, but also how such strategies might evolve over time in response to student needs or outside circumstances that affect K-12 classrooms on a regular basis.

Finally, in order to avoid overlooking contextual factors potentially relevant at the time of this dissertation, it is worth briefly acknowledging some of the ways that the COVID-19 pandemic shaped the

methodological design used during the collaboration being examined for the purposes of this study. To begin, Internet searches for online learning resources in response to COVID-19 were found to be significantly higher in areas of the United States with "higher income, better Internet access and fewer rural schools" (Bacher-Hicks, et al., 2021, p. 1); and in line with this, high-income students utilized online instruction at a significantly higher rate than low-income students (i.e., 90% vs. 60%), leading to speculation that pre-pandemic achievement gaps (i.e., ones that historically left low-income, black and Hispanic students disadvantaged) could be further exacerbated by up to 15-20% (Dorn, et al., 2020,, pp. 5-6). With this in mind, strong emphasis was placed on brainstorming pedagogical strategies (Web-based or otherwise) could ultimately be used to support his students' learning needs in as equitable a manner as possible, particularly in light of the systemic inequities in K-12 educational settings that were indeed frequently observed on a local, statewide and national scale during the pandemic. In addition, as a result of COVID-19 giving schools "limited options" for promoting in-class instruction and the aforementioned inequitable distribution of digital learning resources, scholars predicted that children from lower-income families likely fell "an extra half-year behind those from more affluent families in math and reading", highlighting a need for current teachers to be prepared to teach in classrooms with students whose "learning needs are much heterogeneous than prior to the pandemic" (Bailey, et al., 2021, pp. 272-273). In light of this, high priority was placed on acknowledging (and discussing as needed) the varying levels of trauma and knowledge gaps that students entering the collaborating teacher's classroom were likely dealing with, while also recognizing how such individual differences could be noticeably influencing his pedagogical practices (and corresponding teaching mindset) over the course of the study. And finally, as local and statewide entities sought to respond to policies aimed at mitigating the spread of COVID-19 in schools and elsewhere (e.g., guidelines updated by the U.S. Center for Disease Control or Prevention or CDC), such efforts frequently resulted in rapid changes to school policy (e.g., due to the emergence of variants like Delta and Omicron) that could vary significantly by county or district (Salisbury, 2022). With that in mind, this study was designed to incorporate digital methods of communication for all interactions between the collaborating teacher and researchers. Such a step was partially out of necessity, for it would enable the study to continue as desired even if a return to online or hybrid instruction (rather than face-to-face), as a precautionary measure related to any changes in COVID-19's spread, was enacted by the teacher's school administration at some point during the collaboration. But beyond such logistical considerations, it was hoped that such methodological flexibility could serve as another way of showing the teacher support as he navigated "new demands" and "high levels of stress" related to the expectations being placed upon him during "the current state of education and the pandemic" (Pressley, 2021, p. 327).

Up until now, gaps in the current body of research related to CFT/LICRA have existed due to several key factors, including (a) the relatively recent emergence of the World Wide Web as a primary

resource for humans to compile and share their collective knowledge; (b) learners' inclination across varying levels of expertise to search for relevant information on the Web in an oversimplified and close-ended manner (e.g., searching for a single "right" answer), in a manner often implicitly or explicitly supported by the layout of websites or search engines; (c) the frequent implementation of curricula and assessments within K-12 classroom settings that hinder students and educators' awareness of the merits of developing "habits of mind" associated with CFT (particularly when acquiring and applying knowledge within ISDs); and (d) the tendency for prior LICRA-centered research (e.g., DeSchryver, 2014; Cheng, 2015; Clemente, 2018) to predominately rely on purposive sampling and/or laboratory settings in their methodologies. As a result, despite prior identification of skills underpinned by CFT (e.g., adaptability) as crucial for the future global workforce (World Economic Forum, 2016) and empirical validation of CFT itself (Dennis & Vander Wal, 2010; Spiro, et al., 2019), there has still been no development of curricular strategies that directly addresses the need to bring the thoughts of researchers/theorists and teachers/practitioners together to help students develop such skills (or incorporate CFT as a cognitive approach for engendering adaptive learning mindsets). Beyond this, the existing body of research has not yet examined the process of education researchers and teachers coming together to identify mutual understandings that can foster more meaningful translation of CFT into practice within K-12 schools, nor has a framework or model been empirically developed for ascertaining what such a "meeting of the minds" might entail (as phrased by one of the researchers involved in this study via email on July 18, 2024), for the purpose of bringing together new learning theories aimed at addressing the evolving learning goals and needs of current students with how K-12 teachers understand those theories in relation to the affordances and constraints of the learning environments that they respectively operate within.

With that in mind, this dissertation seeks to use insights obtained through preliminary analysis of the first stage (planning) of a multi-iteration teacher-researcher collaboration to begin exploring how a bidirectional translation process between researchers and teachers might be utilized to expose K-12 students to CFT principles (e.g., while being taught complex or ill-structured topics related to U.S. History, including through use of LICRA Web searching) in ways that can positively affect their patterns of higher order thinking (e.g., consideration of alternative perspectives), attitudes (e.g., epistemic beliefs about U.S. History, learning on the Web and/or learning in general) and/or behaviors (e.g., Web search strategies utilized) as displayed within authentic high school classroom settings. Just as importantly, by including and centering teacher voice in order to more thoroughly and authentically examine how a cognitive theory like CFT/LICRA might be better intersected with pedagogical strategies, it is hoped that this collaboration-based study can also offer invaluable insights on a broader scale, namely by examining how academic theories potentially relevant for the education sector can be more meaningfully and ethically translated to directly support teachers' ongoing practice within their respective classrooms.

1.9: Purpose of Study

Thus, for the purpose of formulating ideas to inform framework research intended to facilitate bidirectional translation of new learning theories into meaningful practice in teachers' existing teaching practices (including within K-12 settings), this dissertation study sought to examine what occurred when a 9th-grade U.S. History teacher and two academic researchers specializing in CFT/LICRA collaboratively attempted to discover mutual understandings between their different perspectives, for the purpose of examining which pedagogical strategies might be most beneficial for the teacher to integrate into his instructional strategies for the purpose of promoting deeper student thinking and learning. Serving as the first stage of a planned multi-stage community of practice between the teacher and researchers, this case study was undertaken by documenting their initial interactions across six iterative Zoom-based planning discussions undertaken by the collaborators, in order to help inform their future planning and preparation of systematic, generalizable research to be implemented within the teacher's classroom setting. In a manner intended to be corroborated by all collaborating parties via interview protocol in future research, this study's chronicling of the planning discussions was intended as a "first step" for identifying ways to facilitate and support the teacher's efforts to incorporate principles related to cognitive theories of learning from academia into his U.S. History curriculum, particularly while teaching ill-structured historical topics that are complex in nature (i.e., without a single "right" answer). And alongside this, it was ultimately hoped that valuable insights could be made regarding how a theory-informed worldview involving CFT (and use of LICRA for Web-based learning) might be best translated for K-12 audiences (high schoolers included) to help them more deeply learn and meaningfully apply their knowledge of U.S. History. Thus, this study sought to analyze, in an exploratory and qualitative manner, the collaborators' attempts during those discussions to brainstorm the potential effectiveness of various teaching strategies (which could be content-based, technological and/or pedagogical in nature; Koehler & Mishra, 2009) in order to fulfill such goals, including their efforts to reflect upon whether or not they complemented the teacher's already established instructional beliefs and practices as shared with the researchers (although he appeared to be sympathetic to CFT from the outset of the collaboration, as will be discussed later on).

In order to pursue this dissertation study's aims, a design research methodology was utilized as an essential facet of the methodology. More specifically, the study was designed to provide a chance for the collaborators to both reflect upon and substantively build off how their preceding interactions unfolded (including during the process of planning out the planning discussions themselves), while also ascertaining the degree to which the teacher's interactions with the researchers informed his subsequent delivery of his U.S. History curriculum (including, but not necessarily limited to, any attempts on his part to incorporate CFT/LICRA into his classroom instruction). Multiple forms of qualitative data analysis were incorporated to ascertain how conversations pertaining to the translation of theory (CFT, in

particular) into practice within the teacher's classroom unfolded across the planning discussions, with high priority placed on exploring (a) important "mutual understandings" discovered between the teacher's pedagogical framework and understanding of CFT/LICRA and the researchers' beliefs about utilizing CFT/LICRA when teaching high school students (and K-12 students more broadly); (b) their respective opinions on how U.S. History should ideally be taught, particularly in relation to key facets of CFT that were explicitly shared with the teacher by the researchers during the planning sessions; (c) the contrast of such sentiments with how U.S. History is currently being taught within K-12 schools, including in the high school where the teacher is employed; (d) what incorporating CFT into the teacher's existing teaching context might entail, including any constraints on his teaching "reality" perceived as potentially impeding teaching practices that he expressed a desire to eventually implement; and (e) any notable interactions between the teacher's pedagogical practices and "lenses" of CFT discussed across the collaboration, including anecdotes or resources shared by the teacher about his initial efforts to incorporate CFT/LICRA into his classroom instruction during the later planning discussions.

Beyond this, space was also allocated in this study to document the collaborators' self-reported mindsets entering the collaboration and their eventual reflections about their experiences within their shared collaborative space itself, including (a) any meaningful takeaways they reported as a result of their involvement (e.g., insights gained from discussing potential interactions between CFT/LICRA and the teacher's preexisting pedagogy); (b) any shifts in their initially held viewpoints that they attributed to their participation (e.g., how their understanding of CFT evolved over the discussions); and (c) any insights they put forth regarding future incorporation of CFT principles into U.S. History curricula within K-12 classroom settings (e.g., "constraints of practice" that could exist for high school teachers), as well as how future iterations of the collaboration itself that might be arranged. Emphasis was placed on noting insights relevant on both a localized and broader scale. For instance, it was hoped that the collaborators might indicate the degree to which any "new" teaching strategies brainstormed involving CFT/LICRA might be complementary, neutral, or "at odds" with the teacher's "old" (i.e., pre-collaboration) teaching practices. At the same time, space was given to consider how contextual factors (e.g., cultural, social, situational) might affect the teacher's (or other teachers') attempts to integrate the learning theory within K-12 settings. Collectively, by centering the design of the study around insights made by the teacher and researchers themselves (with particular emphasis on centering the focus of the planning discussions themselves on the teacher's professional "reality"), it was hoped that the dissertation would be able to situate a cyclical and evolving reciprocal relationship between the teacher-researcher collaborative space and the teacher's classroom context as foundational to the study's methodological design – thereby emerging as an *in-praxis* manifestation of the sort of in-the-moment adaptive response to novel situations and exposure to alternative perspectives that is central to proper application of CFT (and LICRA) itself.

By documenting the teacher and CFT/LICRA researchers' joint efforts to brainstorm ways to integrate CFT/LICRA into the teacher's classroom setting (including monitoring and reflecting on how any insights made might impact his future pedagogical strategies), this study aims to offer a "rich" and multi-perspectival narrative that highlights how their shared understanding of CFT/LICRA's potential use within high school U.S. History classroom settings emerged across the collaboration. Analysis of their interactions was partially intended to be conceptual in nature, namely by exploring possible ways to bridge the teacher's *professional* knowledge from decades of instruction within K-12 classrooms with the researchers' *scholastic* understanding of CFT (including use of LICRA Web searching) and its utilization for higher order learning of ISDs like U.S. History. And indeed, finding common ground between those points of view was explicitly regarded by the collaborators themselves as an invaluable step towards ultimately identifying pragmatic steps that the teacher could take to meaningfully use CFT (and LICRA) to help his students more deeply learn, more frequently apply higher order patterns of thinking and more adaptively respond to complex learning problems both in his lessons and beyond his classroom context. However, merit was also found in documenting how the teacher and researchers' practitioner-based and academic frames of understanding, respectively, interacted with and influenced each other in a dynamic and complementary manner *over the course of the collaboration itself*. This is because there is an urgent need for scholars today to appreciate the unavoidable pragmatic challenges that come with *the translation of theory itself, regardless of the theory being translated* – or, put another way, what it might take for researchers to translate learning theories like CFT into practice (particularly within formal K-12 learning environments) in as informed, ethical, and ecologically valid a manner as possible. So by making efforts to capture how actions by the collaborators gradually laid the groundwork for the development of a new community of practice, it was anticipated that insights gained from this study could benefit future teacher-researcher collaborations even if they are not focused on CFT specifically, namely by illuminating some noteworthy considerations about what meaningful translation of theory might entail on a broader scale.

With this rationale in mind, in order to meaningfully capture the "different realities" and points of view that were likely to emerge from the teacher and researchers involved (Stake, 2005, p. 454), this study sought to utilize triangulation methods for data collected across the study. Along with multi-level analysis of transcripts from the planning discussions themselves, potential data sources examined over the course of the study included any materials shared by the researchers with the teacher to inform his understanding of CFT/LICRA and any journaling (e.g., in-the-moment insights made following lessons) done by the teacher that was shared with the researchers. In turn, this study also accounted for any classroom resources that the teacher chose to create and then share with the researchers (e.g., assignment involving learning on the Web), as well as any anecdotes he provided about his teaching experiences (e.g., deidentified comments made by his students about topics covered in class). It is worth emphasizing

that from the beginning, the study was designed to examine the conditions of this particular case, as well as any data obtained, in a theory-informed manner, such that its findings could serve to support relevant facets of existing CFT/LICRA scholarship (i.e., "analytic generalization"), as opposed to making any unwarranted assumptions about "samples and populations" (Firestone, 1993, p. 17). That being said, in line with Strauss's recognition of the inherent "inter-subjective relationship…between the researcher and the method" (Howard-Payne, 2015, p. 54), the need to equitably acknowledge and validate all viewpoints as essential within the teacher-researcher collaboration being documented, and the author's personal involvement during the collaboration itself, a grounded theory approach was also partially utilized to (a) highlight "previously unanticipated" perspectives (Heydarian, 2016, n.p.) that emerged across the collaboration (including, but not limited to, during the planning discussions); and (b) employ those newly discovered perspectives to inform and potentially refine subsequent collection and analysis of data.

Finally, there were multiple considerations for this dissertation study that need to be explicitly noted when summarizing its aims. First, although student outcomes were not examined directly during this study, attention was given during the collaboration to noting and accounting for any "shifts" that were anecdotally reported by the teacher in his students' thinking, attitudes and/or behavior following their exposure (if any) to principles aligned with CFT/LICRA. For example, if the teacher reported to the researchers that his students were struggling to consider alternative viewpoints or apply metacognitive reflection to their Web navigation (e.g., thinking about how to modify their search queries in direct response to relevant information that they found online), such observations could potentially shift the focus of subsequent interactions between the collaborators (e.g., during later planning sessions). And second, while the positionality of all parties will be further elaborated in the Methods section for the purposes of transparency (Curran & Randall, n.d.), it is worth acknowledging, from the outset, that certain biases might have shaped how data was obtained, analyzed and used to inform later stages of the collaboration for the purposes of this study. Specifically, the author has preceding scholastic interest in the potential merits of CFT/LICRA for students' deep learning and exploration of complex real-world issues (e.g., as the main focus of his practicum research), and this study is intended to both fulfill dissertation requirements for his doctoral studies and lay groundwork for his future academic research. Biases like these, if left unchecked, could affect the veracity of results reported for this study, as well as any implications derived from the data when considering the merits and challenges of integrating CFT/LICRA into future K-12 classroom settings (including the collaborating teacher's). However, the use of triangulation in this study is intended to highlight the redundancy of relevant data (Stake, 2005), thus minimizing the risk of such biases affecting data collection or analysis of any data obtained.

With all this in mind, in preparation for systematic, generalizable research aimed at answering the primary question of how researchers and teachers can come together to attain mutual understanding for

the purpose of developing a framework that is flexible, open, adaptive and multi-perspectival in nature and intended to facilitate the bidirectional translation of learning theories (e.g., CFT/LICRA) into meaningful practice, this dissertation study seeks to address the following four sub-questions:

1. What were the initial mindsets of the 9th-grade U.S. History teacher and CFT/LICRA researchers entering the collaboration, particularly in relation to its central goal of facilitating the teacher's efforts to incorporate CFT/LICRA principles into his classroom instruction?
2. Across the collaboration, what discrepancies were identified and discussed by the collaborators between how they felt U.S. History should be taught in K-12 classroom settings (i.e., in relation to CFT/LICRA and the ways that U.S. History is "traditionally" taught in today's society (including within the teacher's high school)?
3. What considerations or concerns were raised by the collaborators when discussing how to incorporate CFT/LICRA principles within the "constraints" of the teacher's "reality"?
4. How did the collaboration evolve over time, particularly in response to insights reported by the teacher in relation to his initial efforts to incorporate CFT/LICRA principles into his classroom instruction (i.e., as reported to the researchers during the planning discussions)?

CHAPTER 2: METHODS

2.1: Design

The design for this dissertation consisted of an exploratory case study that incorporated a mixture of qualitative methods at different stages as needed (e.g., text-based thematic and content analysis, triangulation with supplementary sources of data shared by the collaborators). This methodological approach was utilized to analyze a series of interactions (including Zoom-based planning discussions and other relevant correspondence between said discussions) between a U.S. History teacher providing instruction within a public high school classroom setting and two university researchers who are specializing in research focused on Cognitive Flexibility Theory (CFT) and different forms of CFT-based learning (including LICRA Web searching), in a manner intended to lay the foundation for more deeply exploring noteworthy topics that might emerge during future iterations of their collaboration.

In addition, a design research methodology was incorporated into this study for several reasons. First, as pointed out in Alghamdi & Li's (2013) examination of design-based research in educational settings (p. 4), scholars like Herrington, et al. (2007) have recognized the methodology's relevance for balancing "known and hypothetical design principles with technological affordances" to identify "plausible solutions" to complex learning problems, in a manner that allows the use of "reflective inquiry to test and refine innovative" teaching practices based on feedback from "real contexts" (p. 4090). Thus, design research was incorporated in this study for the purpose of proactively attending to any notable experiences or concerns reported by the teacher as they were shared – thereby enabling there to be sufficient opportunity to modify the teacher and researchers' interactions as needed *as the collaboration unfolded* (e.g., reevaluating which topics to discuss, ruling out potential learning activities due to the teacher's existing constraints), in order to begin identifying the most effective and feasible ways to support the teacher's pedagogical goals (including potential implementation of CFT/LICRA principles).

Second, design research enabled the incorporation of a "systematic but flexible" approach to the collaboration being analyzed, namely by affording the ability from a methodological standpoint to iteratively develop "contextually sensitive design principles" that were more thoughtfully aligned with not only the teacher's unique classroom needs, but also the study's broader aims (Wang & Hannafin, 2005, pp. 6-7). More specifically, strong emphasis was placed on the need to build upon the "*metacontracts* of communication endorsed" by the collaborators during their periods of intersubjectivity (including during the planning sessions), such that their distinct perspectives could inform "a temporarily shared HERE and NOW" in order to bridge their thinking about CFT/LICRA and how it could be incorporated within the teacher's teaching context specifically (Rommetveit, 1976, p. 202; capitalization added by author). In other words, by centrally basing the findings of the study (and how the study itself unfolded) on insights

that the collaborators themselves made during their initial time together (including any "meeting points" found between their worldviews), this study sought to embed a sense of mutual understanding as *an undercurrent for the study design itself* – which this study argues is a necessary consideration for any ethical and effective translation of theory into practice, and one that is, even today, too often taken for granted or overlooked by education research when conducted within authentic classroom settings.

Finally, for the purpose of attaining greater ecological validity and identifying more meaningful ways to "assess, inform and improve practice" within a particular context, there is consistent empirical precedent to use design research during the opening stages of a "multi-iteration research project" (Anderson & Shattuck, 2012, pp. 16, 23). In particular, by setting up collaborative spaces in ways that can provide an "anchor" for K-12 teachers to "engage in new teaching moves" and construct "new 'teaching knowledge'" to inform their pedagogical decision-making, education researchers can "promote teachers' ownership of the approach…(and) increase their understanding of its conceptual bases" in a manner that can ultimately "enhance the quality of the research" being undertaken (Englert, et al., 1998, 255, 262). With this in mind, building off the precedent set in preceding scholarship, efforts were made to broadly frame this first "iteration" of the collaboration under a "Year 1 approach", including (but not limited to) "constructing a shared body of knowledge", identifying potential avenues for taking "new intellectual risks" to apply that knowledge, and reinforcing the perception of teachers as "experts and authors of curricula" (pp. 260-261). It was anticipated that such efforts could collectively help the teacher feel empowered to work alongside the researchers in navigating the "complexity of goals and purposes" likely to be involved when brainstorming how to integrate CFT/LICRA into his classroom setting, while also fostering more thoughtful consideration of factors aligned with CFT itself (e.g., weighing the teacher's use of principles associated with the theory across contexts, rather than "restricting its use to a single time"; being open to "multiple roles for students", in order to provide them opportunities for greater control during their learning; pp. 266, 270). Thus, it was hoped that by using design research to centralize the teacher's perspective and frame him as an "initiator of change in (his) classroom" (p. 273), this study could more effectively serve as a foundational step (i.e., a "Point 1") to inform future iterations of the collaboration, including the development of more formalized CFT/LICRA-based interventions to potentially implement within the teacher's classroom setting (and, ultimately, those of other teachers).

Because of this, the aim of this qualitative case study (and the design research-based methodology it utilized) was *not* to definitively ascertain the effectiveness of a particular CFT/LICRA-centered curriculum, nor was it to infer generalizable causality from any empirical results observed while the teacher implemented certain instructional features within his classroom setting (Kohavi & Thomke, 2017). Rather, it aimed to examine in an exploratory manner how the collaborators attempted to adaptively interact and attain mutual understanding with each other with the teacher's specific teaching

goals in mind. And such a methodological process, from the beginning, was designed to acknowledge the need to appreciate, become informed about and duly account for the teacher's *inherently complex and ill-structured efforts* to teach within his unique learning environment, rather than relying on any predetermined and rigid sense of which ways of introducing CFT/LICRA to his 9th-grade students might be most appropriate or effective. By doing so, this study was intentionally situated to enable the researchers and teacher to proactively share and jointly reflect upon their perspectives in response to *whatever might emerge during the collaboration itself*, particularly in relation to brainstorming which strategies might ultimately be most effective for introducing CFT/LICRA to the teacher's students within his authentic teaching context (including ones that involve using the Web for teaching and/or learning purposes). And indeed, such a methodological approach aligns with prior research in the learning sciences that emphasizes the importance of navigating "new tech" spaces by iteratively designing them with a "try it out" mentality, including identifying "sites" for "structured creative exploration" and recognizing the importance of collaboration to share and develop important ideas (Lloyd, 2019, p. 175). And thus, this study's methodological design entailed not being able to fully anticipate ahead of time how specific facets of the collaboration might unfold (including during the planning discussions), due to the need to be prepared to defer to the teacher's needs *as they were shared*. However, efforts will be made to fully describe any modifications that occurred (and their rationale) in later sections of this manuscript.

In addition, looking at the nuances of this study's methodology more closely, it is also critical to note that this dissertation was *not* designed to treat this collaboration as an "individual 'case'" akin to single-subject experimental design (Kratochwill, et al., 2010), nor was it aiming to empirically compare the conditions of the teacher's classroom setting (or the mindset of the teacher or researchers themselves) in a manner that entailed prescribing an "A" phase (i.e., baseline) and "B" phase (i.e., post-intervention), or a "before" and "after" condition, in a quantified or predetermined manner (McReynolds & Thompson, 1986). Rather, strong emphasis was placed on examining this collaboration more organically by *seeing where things go*, namely through proactively adapting to how the teacher and researchers' interactions unfolded as needed but otherwise letting them play out as they naturally would. By doing so, building off the respect for the inherent complexity of individual "cases" promoted by CFT literature (e.g., Spiro, et al., 1988), it was hoped that the idiosyncratic facets of the researchers and teacher's respective points of view might be brought forth in a manner that could be more thoughtfully considered and duly respected, thereby laying the groundwork for more impactful and reciprocally beneficial collaborative undertakings in the future (including when potentially implementing CFT/LICRA-based interventions within the teacher's classroom). Even further, by setting up conditions within the collaboration to support the sharing of ideas by all collaborators in a non-judgmental manner (i.e., without identifying a specific and rigidly predefined set of outcomes as indicative of its success), it was envisioned that creating such an

environment might help make the teacher (as well as the researchers themselves) comfortable with sharing insights and suggestions in a more open manner that could engender deeper collective reflection on what it might entail to promote a CFT-aligned "adaptive mindset" to high school students specifically (Spiro, et al., 2019) – thereby taking proactive steps toward minimizing the risk of *the collaboration itself* oversimplifying its exploration of the *inherently ill-structured topic of teaching CFT/LICRA itself*.

All that being said, for the purpose of offering some structure to the collaboration's exploration of what it might entail for the teacher to integrate instruction related to CFT and CFT-based learning on the Web (e.g., LICRA) into his classroom, there were broad goals used at different "stages" of the study to guide the direction of the collaborators' interactions (particularly during the six planning discussions, which, when cited moving forward, will be frequently referred to as PD1-PD6). However, it should be noted that in the spirit of design research, these "stages" were not fully finalized at the start of the study. Nor should one assume that transitions between these stages, either when planning the collaboration or analyzing data that arose from it, strictly adhered to a chronologically-based cutoff imposed in a rigidly siloed and predetermined manner. Rather, it is more appropriate to think of such transitions as being akin to a gradient, with space given to revisit insights, build upon them or move between insights from other stages in a nonlinear manner as appropriate for the benefit of the collaborators or this study's aims. With such considerations duly acknowledged, the "stages" of this study can be roughly summarized as follows:

- Stage 1 ("Preliminary"): shared initial mindsets, in order to discover "mutual understandings" and lay groundwork for future discussions or interactions (i.e., for this study specifically and beyond)
- Stage 2 ("Introduction of CFT/LICRA"): researchers introduced key facets of CFT/LICRA to the teacher, accounting for both how the collaborators' mutually agreed history "should" be taught and expectations placed upon the teacher by his school regarding how they want him to teach it
- Stage 3 ("Consideration of Teacher's 'Reality'"): space was given for the teacher to reflect upon (and share with the researchers) constraints from his teaching "reality" that might be relevant, in a manner that thereby allowed the researchers to reevaluate what "translation" of CFT might entail
- Stage 4 ("Reporting of Initial Efforts"): in a manner both encouraged by the researchers and initiated by the teacher, the teacher shared anecdotes surrounding his initial attempts to integrate CFT/LICRA into his pedagogical strategies, with resultant insights by all collaborators duly noted

As noted in Table 1 below, data intended to help answer this study's primary question was predominately collected during the planning discussions (i.e., Stages 1-4), which took place between January 2022 and June 2022. Predominately occurring during PD1, Stage 1 (intended to help answer SQ1) was aimed at assessing the entering mindsets of the teacher and the researchers on several levels, as

shared during their initial interactions within the collaboration. First, high priority was placed at ascertaining the teacher's preexisting teaching beliefs and pedagogical framework that underpinned his U.S. History instruction to his 9th-grade students, including any that were identified by the researchers as being noticeably aligned with CFT/LICRA even *before* the collaboration took place. Second, efforts were made to document the teacher's initial understanding(s) about CFT, as well as his initial thoughts about how the collaboration itself might unfold. Third, time was spent noting the preexisting beliefs held by the researchers about teaching CFT/LICRA to high school students, as well as any challenges that they initially anticipated for introducing CFT as a learning theory (both to the teacher himself and to his students). Finally, strong emphasis was placed on making note of any "mutual understandings" explicitly identified by the teacher and researchers that might serve as common ground between their perspectives, in a manner could thereafter inform the topics of discussion covered during later stages of the study – including, but not necessarily limited to, what meaningful "translation" of CFT/LICRA might entail.

Sub-Question (SQ)	**Main Stage of Study Used to Answer SQ**	**planning Discussion(s) Primarily Used to Gain Insights for Informing Corresponding SQ/Stage**
SQ1	Stage 1	PD1, as well as PD2-PD6 as needed
SQ2	Stage 2	PD2-PD3, as well as PD1 and PD4-PD6 as needed
SQ3	Stage 3	PD4, as well as PD1-PD2 and PD3-PD6 as needed
SQ4	Stage 4	PD5-PD6, as well as PD1-PD4 as needed

Table 1. Layout of Sub-Questions, Study Stages and "Planning Discussions" Used for Information[1]

In a manner meant to thoughtfully build upon those "mutual understandings" as they were discovered during PD1, Stage 2 (intended to answer SQ2 and largely taking place during PD2-PD3) homed in on the collaborators' shared desire to meaningfully respond to discrepancies observed by all parties (albeit from different perspectives) between how they believed U.S. History should be taught in K-12 classrooms and how they felt the subject is "traditionally" being taught today (including how the teacher was being expected to teach the subject in his high school at the time of the collaboration). This first entailed documenting how the researchers chose to introduce key principles or facets of CFT/LICRA to the teacher, including how they strove to make the learning theory as digestible as possible for him given its inherently complex and holistic nature. Second, this stage revealed the beginning conversations about what pedagogical steps might be worth considering for helping the teacher's students approach

[1] This table is not intended to suggest any rigid categorization put in place beforehand or afterwards, but rather, to offer a basic summary of which PDs served as initial jumping off points to inform which SQs as the study unfolded. For further elaboration about which data was utilized to address each sub-question for this study, see Appendix A.

learning about U.S. History with a mindset more aligned with CFT. This included the need to proactively account for any extenuating factors perceived as potentially supporting or hindering such efforts both within the teacher's classroom (e.g., students' preexisting approaches toward seeking information online, limited time available to deeply explore historical topics given the curricular guidelines in place for the teacher's class) and beyond it (e.g., impact of current political climate, including risk of backlash from parental figures to how controversial topics might covered during the teacher's instruction). Finally, out of respect for the teacher's professional constraints (as recounted by him during Stage 1), Stage 2 was also when the researchers sought to begin adjusting their approach toward the collaboration itself (including what they might ask the teacher to do, as will be explained in detail later in the manuscript).

While some facets of their initial mindsets (and their initial thinking about how CFT/LICRA might be integrated into the teacher's classroom) were revisited and reflected upon more fully during later stages of the study (i.e., during Stages 3-5), in order to ascertain as much of their initial thinking as possible during Stages 1-2 of the collaboration, there was a need to have the first three planning discussions take place *before* submission of the dissertation proposal itself for multiple reasons. To begin, if the researchers and teacher substantially informed each other about CFT and key aspects of the teacher's classroom context or teaching "reality", respectively, *before* their first collaborative discussion took place, then any data related to their initial thinking (i.e., at the start of the collaboration) would be irrevocably affected, in the form of such thinking either being lost to time or prone to being significantly affected by hindsight bias and/or the fallibility of human memory (i.e., by being recalled at a later time). [Note: For full transparency, there was some interaction between the collaborating parties prior to the planning discussions. However, while those conversations did briefly mention CFT/LICRA, such allusions were not extensive and were solely intended to inform the identification of a study design that was pragmatically feasible given the emergence of the COVID-19 pandemic, with the planning discussions ultimately serving as the first formal interaction between all three collaborators.] But more importantly, such an approach was meant to facilitate the use of "mutual understandings" identified between the teacher and researchers' perspectives to inform future iterations of the collaboration itself – not only to proactively accommodate the teacher's self-reported constraints during this study, but also to implement grounded data analysis for identifying noteworthy themes to inform planning of both later stages of this study and future follow-up research (as will be discussed in detail later in the manuscript).

Building off insights made by the collaborators while they interacted with each other during their first three planning discussions together, Stages 3-4 (primarily taking place during PD4-PD6) were put in place with the primary goal of chronicling how any meaningful "mutual understandings" between the researchers and teacher *appeared to grow and evolve over time*. To start, Stage 3 (intended to help answer SQ3) was aimed at capturing the collaborators' collective efforts (particularly during PD4) to

begin brainstorming how "translation" of CFT/LICRA *within the teacher's unique teaching "reality"* might be feasible given his existing constraints – in a manner that tried to account for any pedagogical strategies that indicated the teacher's preexisting inclination and capacity for integrating complexity into his lessons, existing assessments cited as being complementary or opposed to what CFT as a learning theory promotes, and any other resources and logistics identified as possibly being relevant. Finally, Stage 4 (meant to help answer SQ4) was put in place to closely monitor insights reported by the collaborators in response to the teacher's initial efforts to incorporate CFT/LICRA principles into his classroom instruction (i.e., as reported to the researchers during the planning discussions). In a manner that largely took place during PD5-PD6 and was intended by the teacher to build upon collective brainstorming conducted earlier in the collaboration, efforts were made to note (a) interactions with students specifically that were broadly identified as relevant for his potential integration of CFT/LICRA (e.g., variations in students' lived experiences; notable changes in their demeanor and/or motivation since the onset of COVID); (b) anecdotes shared by the teacher about his attempts to apply CFT/LICRA principles to his classroom instruction during the collaboration (e.g., noteworthy student responses, strategies considered for offering feedback); and (c) the collaborators' perception of the degree to which CFT/LICRA appeared to be complementary (or at odds) with the teacher's preexisting pedagogy. In the spirit of design research, it is worth noting here (although it will be discussed in greater detail later) that while the teacher's efforts were self-initiated, priority was nevertheless placed on adjusting the focus of the collaboration accordingly to document them (as well as how the researchers responded). In turn, even though "A" and "B" phases were not formally implemented into the study design, attention was still given to carefully monitoring how the mindsets, attitudes or beliefs of the collaborators seemed to evolve as a result of insights gained by the teacher from his initial attempts to integrate CFT/LICRA (e.g., when using CFT felt more or less helpful for him, any benefits or costs he perceived for the students or for himself).

To summarize, in order to center the collaboration on a "joint commitment" to ethically explore the complexities of integrating CFT/LICRA within the teacher's unique learning environment (Ulichny & Schoener, 1996, p. 518), it was critical to not only make respect for the teacher's existing professional constraints a top priority, but also take proactive steps to ensure that the study design was as fully aligned as possible with his pedagogical goals as they were shared with the researchers (Weinstein, et al., 1991). With that in mind, as denoted in Figure 1 below, it was essential to use the initial planning discussions to explore the nature of the collaboration (and initial mindsets of the collaborators) *as a foundational first step* for this study's methodological design, in order to ensure that any subsequent efforts across the collaboration to create a "shared body of knowledge" were properly situated to accommodate and prioritize the teacher's "own goals and interests" (Englert, et al., 1998, p. 260). From there, by sufficiently building upon mutual understandings discovered between the collaborators and promoting a

team-like dynamic that could home in on a vision that the collaborators collectively wished to implement or pursue (i.e., exploring the potential use of CFT/LICRA within the teacher's "reality"), the study sought to lay the foundation for the development of a community of practice within their collaborative space. And through that community of practice taking form, it was hoped that a dynamic and reciprocal relationship could begin to emerge between insights made by the collaborators during their time together and relevant experiences reported by the teacher related to his classroom setting. By doing so, it was hoped that insights gained during this study (contingent upon their being verified by the teacher and researchers during planned follow-up research) could serve to meaningfully inform their future "joint" collaborative efforts, particularly for the purpose of supporting the teacher's pedagogical needs.

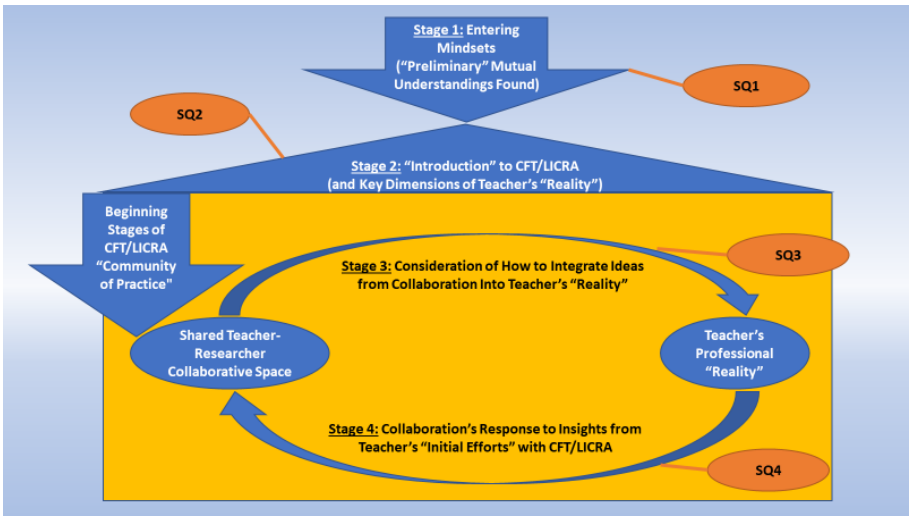

Figure 1. Visual Representation of Relationship between Stages of Study and SQs and Resultant Emergence of Community of Practice between Teacher and Researchers [Note: The stages should *not* be considered discrete and sequential; but rather, they were intended to feedback on each other over time.]

That being said, there were several methodological considerations critical to acknowledge at this point. To begin, the planning discussions were initially cleared by IRB for the purpose of helping fulfill this dissertation's aims, albeit in a manner denoting such data collection as not qualifying on its own as "human subjects research" by IRB due to not having a "systematic design" meant to "contribute to "generalizable research". [Note: See Appendix B for the full text of the letter from MSU's IRB Office.] That being said, this manuscript puts forth the argument that for the purpose of providing preliminary information for helping plan future framework or paradigm research that is more generalizable and systematic in nature (e.g., identifying key questions or factors to examine further), this study's examination of data from those planning discussions holds empirical merit due to its potential use to help lay meaningful groundwork for future examination of how researchers and teachers might come together through "mutual understanding" to better translate academic theories or ideas into practice. Second, in

light of the collection of data from the planning discussions not being designated as "human subjects research", obtaining teacher consent was not deemed necessary for this manuscript, although such consent will be obtained for any follow-up research involving this collaboration that is designated as "human subjects research". [Note: See Appendix C for the consent form that will be provided to the teacher for the planned expansion of this study that will be undertaken for future publication purposes.] Nevertheless, even as all interactions during the planning discussions (and across the study more broadly) were centered around the "reality" of the teacher's classroom context, it was explicitly stated from the beginning that the teacher was to "not give identifiable information about (his) students or share any of their direct work" to the researchers for this study specifically, although his discussing his students' behaviors and/or work in an anecdotal, journalistic and deidentified manner was permitted.

Third, agendas were distributed to the collaborators in advance for the three planning discussions that took place before submission of the dissertation proposal (i.e., PD1-PD3, or Stages 1-2), albeit in a manner while space was given for the collaborators to (a) navigate the agendas in whatever order they might prefer as their conversations unfolded; and (b) omit or add agenda items or topics to discuss as deemed appropriate. However, during email correspondence on May 5, 2022, it was recommended by one of the researchers that there was "no need" to distribute agendas in advance of the remaining planning discussions (i.e., PD4-PD6, or Stages 3-4) due to the merits of keeping the collaborative discussions more "open-ended" in nature. Instead, he suggested that the author of this study simply "have (the agenda) handy" or share it at the "beginning" of the meeting, thereby reframing the agenda primarily as a resource for the latter to take field notes and self-monitor to ensure that "everything (he might) need to talk about for the dissertation gets talked about"; and such advice was ultimately heeded.[2] [Note: See Appendices D-F for the abridged agendas shared with the collaborators before PD1-PD3, which occurred on January 2, 2022, January 16, 2022, and February 24, 2022, respectively. In turn, see Appendices G-I for the agendas used by the author for PD4-PD6, which occurred on May 5, 2022, May 17, 2022, and June 9, 2022, respectively. For all agendas shared, any identifiable information (e.g., teacher's name or school) has been omitted.] Finally, while inherent limitations in terms of generalizability come with implementing an exploratory case study design for the purpose of fulfilling this study's aims, it is nevertheless important to highlight its relevance due to its ability to inform educational research involving teacher-researcher collaboration in ways that promote greater ecological validity across multiple empirical criteria (Buchan, n.d.), including internal validity (e.g., noting teachers' sense, going off their experiences and professional expertise, of how effective frameworks like CFT might be for student learning beyond laboratory settings), external validity (e.g., proactively centering the goals of

[2] Special thanks to Madison Kuyenga for encouraging the author to explicitly frame the nature of the unshared (or differently shared) "agendas" from PD4-PD6 as a tool for reference as field notes or reminders in his facilitator role.

collaborations around the "reality" of teachers' navigation of their authentic classroom settings, in a manner aligned with both their preexisting teaching goals and state/national standards for K-12 education), and construct validity (e.g., documenting teachers' efforts, as reported to collaborating researchers, to integrate theories of learning in ways that fit their respective learning environments).

2.2: Participants

This dissertation study consisted of a multi-stage collaboration between three white adult cisgender males, including two researchers at a public Midwestern university specializing in CFT/LICRA (who will frequently be identified from this point on as "CFT Expert" and "PI") and one 9th-grade U.S. History teacher who works at a public high school in a Midwestern suburban district ("Mr. R"). Given the importance of highlighting the "*metacontract* of communication" and valuing of each collaborator's perspective that was "tacitly and reciprocally endorsed" to fulfill the aims of this particular case study (Rommetveit, 1976, p. 202), it is important to briefly acknowledge some of the most pertinent "values, standpoints, and positions" (Daly, 2007, p. 33; cited by Curran & Randall, n.d., p. 4) that underpinned the different viewpoints held by each of the aforementioned individuals as contributors to said collaboration.

To begin, the "CFT Expert" originated Cognitive Flexibility Theory as a cognitive theory of learning within academia and has since worked for decades as a researcher and tenured professor in the field of educational psychology (and educational technology). When asked over email correspondence (on March 9, 2022), he noted that although "everyone has a rich, multidimensional identity", he "can think of no aspects of (his) identity that impact how (he) explain(s) CFT" during the collaboration. In turn, from his perspective, he believes that "'single dominant perspective' beliefs and dogmatism/rigidity would have a larger effect on translating CFT into curriculum" than a person's identities. Finally, he expressed his desire to go into this collaboration with a desire to descriptively document any results that emerge from the teacher's implementation of CFT/LICRA, regardless of the outcomes reported (a sentiment shared by the PI). As noted by the CFT Expert during the aforementioned correspondence, "Things not translating very well to the teacher or to his practice is equally valuable data as things that seem to go smoothly…In fact, I'm more interested in what is not easy to translate so I can work on that."

Second, the "PI" is a doctoral candidate with research interests that include "cognitive flexibility, use of digital technologies and Web search strategies for online teaching and learning, and development of learning environments aimed at institutional adaptiveness and cultural responsiveness to the evolving needs of students, teachers and communities" (as described in a bio that he shared for a journal article on December 15, 2021). In his role as a mediator for this study (i.e., when moderating and preparing the layout for all planning discussions that took place across Stages 1-4) and the author of this manuscript, he was particularly sensitive to his positionality. In particular, as noted to the CFT Expert over email correspondence (on March 9, 2022), he recognized that complications might arise while attempting to

learn about the teacher's "considerable experience teaching U.S. History to high schoolers as a white man", stemming from a combination of having never taught in K-12 classrooms before, his awareness of the impact of white supremacy on how high school U.S. History is taught and the systemic constraints involved when teachers seek to "undertake significant curricular and instructional revision" in their classrooms (Stutts, 2020, p. iii), and his recognition that he was "less attuned to the traumas faced by many in the pandemic" (e.g., joblessness, unstable family structures, caring for children needing "at-home learning conditions"). Thus, the PI made it a point to acknowledge how his identities and lived experiences could affect his efforts both across the collaboration and during data analysis – which, indeed, played a significant factor in his decision to centralize teacher voice in the study design.

And third, "Mr. R" has been working a high school U.S. History teacher for around 20 years since coming into the role in his forties; and from his perspective, his prior work in multiple places as a retail manager has informed his understanding of "how to treat people if you want them to do what you want them to do" within a classroom setting as well (58:51-59:28 in transcript of planning Discussion 1, or PD1, 58:51-59:28). He is particularly passionate about creating experiences (and producing learning materials) that draw out meaning from each chapter of the textbook he is required to cover, which fuels his concrete efforts to support his students. For example, when teaching a chapter pre-pandemic, Mr. R described to the PI his efforts to provide (a) a bound booklet with copies of the chapter's pages from the textbook, so that students can follow along and take notes in some version of the textbook; (b) a fill-in-the-blank summary sheet for each subsection of a given chapter, which students fill out as they go through the chapter together during class time; (c) printouts of all the textbook's end-of-section activities and end-of-chapter tests; and (d) his own test covering each chapter's material (e.g., multiple choice, matching, essay/short answer, True/False). And it is also worth noting that while he had not "used paper in two years" due to COVID-19 at the time of the collaboration's onset, he had put in the effort to ensure that all necessary documents were "digitized digitally" for his students to access online (PD3, 44:41-45:28).

At the time of this study's implementation, Mr. R was teaching 5 classes with roughly 25 students each, with his student population reported by him as being fairly balanced in terms of gender and majority white (with roughly 15-20% of his students being black or African-American and 20-25% Hispanic, which he noted as being "not overwhelmingly a white majority"; PD3, 29:11-29:49). During the planning discussions, he noted his tendency to "frame any discussions in a more or less linear pattern through the textbook" (PD3, 43:34-44:09) he has been assigned to use to teach U.S. History, which is titled "Call to Freedom" (Stuckey & Salvucci, 2005) and published by Holt, Rinehart and Winston. However, he also considers himself "a storyteller, a raconteur", such that he gravitates to telling stories "from (his) own life" even if they are "not…particularly" related to "questions or things in the textbook" (PD3, 43:53-44:09). And indeed, building off his awareness of his classes' demographics, his efforts when telling

stories (and planning learning activities) are anchored in his overt acknowledgment of the limited perspectives provided by the textbook that he must use and his desire to combat that issue. For instance, one assignment he developed pre-collaboration involved creating a diorama dedicated to the contributions of a forgotten person in history (often due to marginalization and systemic prejudice in history textbooks and elsewhere); and in his classroom as an exemplar, Mr. R showed PI a diorama of James "Big Jim" Parker, the African-American man who stopped U.S. President William McKinley's assassin from firing off a third shot. Beyond this, he regularly supplements his lessons with media to highlight marginalized perspectives, such as using The Grapes of Wrath to discuss the Great Depression (PD1, 48:32-49:50), Grave of the Fireflies to discuss WWII (PD3, 48:47-49:52) and 13th to discuss Reconstruction (PD3, 47:32-48:45). Thus, a deep-seeded earnestness to bring to highlight the impact of marginalized groups accept history is worth noting as a high priority in Mr. R's teaching philosophy.

Such day-to-day curricular steps seem to strongly align with Mr. R's broader pedagogical mission of creating a learning environment built upon the notion that "every person that walks in the door is a person…a completely new, novel and complete and complex individual that is in front of you" (PD1, 59:08-59:28). And as explained to the CFT Expert and PI, such a mindset also impacts his classroom expectations and his approach to student assessment. To begin, when asked to share educational theories that actively influence his teaching, Mr. R identified Maslow's Hierarchy as one that influences him "every day" as a "given" due to needing to "think about where your students' reality is at", namely in terms of whether he can expect a given student to "reach self-actualization today" or if his concerns should instead lie with if "they had a meal or are they warm" (PD1, 54:41-55:04). From there, Mr. R self-identified his expectations for his students as "unusual" compared to his teaching peers, in the sense that if his students "work as hard as (they) can and do the assignments that are given and show attentiveness and participate", then they can expect to "get an A" from him – an approach that the PI noted as being similar to the CFT Expert's teaching style with his postsecondary students (PD3, 45:14-45:31). In this sense, Mr. R's pedagogical mindset, by his own admission, focuses more on monitoring students' individual effort and well-being rather than their abilities in a comparative manner. This ties directly to how Mr. R broke down his assessment rubric to the researchers, noting that "the daily work…, the quizzes…, and then 'participation'" each count for one third of his grading (PD3, 46:04-47:24). In fact, the teacher was quite clear in stating that prioritizing "participation" is intentional for him and aimed at giving "a lot of leeway" through placing strong emphasis on if students are "being engaged with the lesson" (e.g., "think and tell us what you're thinking, or participating in a discussion, or simply raising your hand to ask a question"), rather than tracking their test performance alone (PD3, 46:13-47:24). In this sense, Mr. R described his approach as "basically summative" in nature; and while he understands what formative assessments are "supposed to do for students" and that "a lot of (his) teaching peers"

utilize them (e.g., seeking to "improve (students') status on that rubric"), he sees no reason to "change from the system…that seem(s) to be working for (him) and the students" he teaches (PD3, 47:50-48:30). On the contrary, he expressed hatred for "everything about" standardized assessments and what they often promote in K-12 education, including their tendency to incentivize poor teaching practices (i.e., framing instruction around answering "the questions on the test", rather than mastery of subject matter) due to student performance on such measures often being "tied to a teacher's pay" (PD1, 1:13:16-1:13:46).

Naturally, such a pedagogical approach by Mr. R has fostered an authentic awareness of the inequities often faced by his students (e.g., access to resources, lived experiences), which is particularly crucial to note in light of how U.S. students like his have often struggled since the onset of COVID-19. For instance, a major issue raised nationwide during the pandemic has involved the potential widening of a "digital divide" (e.g., high-speed Internet access) between students from different backgrounds. On the one hand, efforts were made by State Education Agency (SEA) leaders, as well as local educators and schools, to provide "high-quality learning content, training, and communication" that could produce the "data and technology infrastructure" needed to accommodate all vulnerable populations (e.g., students of color, students living in poverty, students with disabilities, English Learners; CCSSO, 2020, p. 3). Nevertheless, it has been found that limited access to technology (i.e., computer or Internet) has still been disproportionately experienced by Black/Hispanic households (i.e., 1.3-1.4 times more likely to face that challenge compared to non-Hispanic White households) and lower-income households (i.e., over 2.5 times more likely compared to higher-income households) during COVID-19 (Ong, 2020, pp. 13-14). And even more alarmingly, 43% of U.S. district superintendents were found to have inadequate "instructional capacity" to provide high-quality avenues for online learning for all students within their respective jurisdictions (ISTE & CMU, 2020, p. 3). As a result of such inequities, scholars have begun to fear (e.g., Bailey, et al., 2021) that achievements gaps reported over the past half-decade on a national scale by entities like the Pew Research Center (Reilly, 2020) and the National Center for Education Statistics (Smith & Reeves, 2020) have likely been exacerbated – concerns that appear to be empirically validated for both low-income students and students of color (Cohodes, et al., 2022), in a manner that is displayed both locally (Kilbride, et al., 2021) and across academic subjects (Kuhfeld, et al., 2022).

With such a framing of the national educational climate in mind, it is important to point out that as of the third planning discussion (i.e., February 24, 2022), Mr. R confirmed that his school was "not remote, only in person"; and further, despite initial concerns at Mr. R's school around the start of Stage 1 (i.e., January 2022) that the emergence of the Omicron variant might "mess things up", sick students at his school "just went home sick and they'd quarantine and they came back" (PD3, 42:16-42:33). In fact, when reflecting on his school district's mindset from an institutional standpoint, Mr. R indicated that "in the future", he doesn't see his school "try(ing) to do anything like remote again" (PD3, 42:34-43:13). In

turn, when discussing resources available for his classroom setting, Mr. R described to the researchers his ability to access the Internet via the computer that he has on hand (as well as on his phone in case he "need(s) to look something up"), and he also indicated his access to "a whole library of books" on hand for use in his classroom, although many were brought home during the pandemic (PD3, 50:17-50:37). However, Mr. R did indicate to the PI (when asked about it) that the "computer lab" that had existed in his school pre-pandemic was no longer there, plans are in place to introduce a supply of computers that can be "plugged into a (portable) bank" in his class "within the next six months" (PD3, 50:47-51:45). Collectively, from a logistical standpoint, Mr. R's teaching goals at the time of the collaboration appeared to be situated towards trying to keep everything "as close to a normal year as possible…covering the same subjects and doing the same things that we would do in an any normal year" (PD3: 48:45-49:52).

But such aims for normality begged another question: where did Mr. R feel *his students* stand at the time of the collaboration (particularly during the planning discussions) compared to pre-pandemic? On the one hand, when the researchers asked whether any major constraints on his teaching practices emerged after returning to in-person instruction, Mr. R postulated that any students who were not completing work in person "would probably be the same ones who just didn't turn it in" when his classes were online (PD3, 44:58-45:28), indicating a sort of status quo carried over from his virtual instruction. That being said, when describing the temperament of his current students compared to those he taught *before* the COVID-19 pandemic (which will be more fully explored later in the manuscript), Mr. R indicated that the differences in their demeanor were indeed noteworthy, reporting that their behavior appeared to be "getting a little bit worse" in ways that involved them "just being really froggy" or aggressive in general – with some not even bothering to attend class (PD3, 42:57-43:13; 49:37-49:52). And from an engagement standpoint, Mr. R's comments were even more alarming, with him noting in frustration that his students were generally not giving "a shit about anything" and displaying "the least student-like behavior that I have seen in any group of students I've ever had" – to the point where he even speculated that in "every class, I'm only teaching to about five students, maybe" (PD1, 42:43-43:14).

Put together, what can these challenges tell us about Mr. R's classroom setting, in relation to how he and his students were situated (e.g., in relation to their potential receptiveness to CFT/LICRA) at the start of the collaboration? To begin, it is worth reiterating the sizable impact of the extended period of time that students nationwide had to learn under remote conditions – with many parents choosing to keep their children enrolled as online students even after restrictions were no longer being uniformly imposed on their school districts, a trend also observable within the one Mr. R is employed by (Siemaszko, 2021). Under such a learning context across multiple years, Mr. R confided to the CFT Expert and PI that during the peak of the pandemic, he often struggled to encourage his students to take steps that would enable them to develop a new "mental landscape" that would ameliorate the challenges of attending school from

home, particularly since (a) he could not assume that beneficial at-home learning conditions existed on a consistent basis for all of his students; and (b) he was not permitted to enforce a rigid attendance policy. Two noteworthy examples of this issue reported by Mr. R to the PI pre-collaboration are as follows:

1. He noted one student who appeared to have one computer ready for classwork and three computers set up for his gaming system – leading to a battle for his attention that Mr. R was both consciously aware of and ultimately pessimistic about winning.
2. One of Mr. R's student's mothers asked to meet with him about her child not getting the grades that she expected. During their ensuing discussion, she made various excuses related to the child's lack of resources, but it became clear that she had not monitored his efforts closely (e.g., she did not recognize how the Study Guide could be accessed using links provided by Mr. R).

Building off such anecdotes, prior empirical findings offer some additional insights into why Mr. R's students may have been displaying such strong patterns of disengagement during the collaboration – even after Mr. R's school district began to allow students to return to in-person instruction. First, scholars have previously highlighted the importance of parents/guardians and school personnel engaging in effective two-way communication and collaboration while monitoring student progress (Chrispeels, 1996). In particular, it has been found to not only predict mental health in adolescents also their academic achievement, including both behavioral (e.g., not skipping class, completing schoolwork on time) and emotional engagement (e.g., enjoyment and value of school learning) (Wang & Sheikh-Khalil, 2014). And Mr. R clearly recognized the importance of parental involvement for his students' success. But sadly, he acknowledged that during the pandemic, many parents/guardians were often not able to adequately provide such reinforcement – thereby fostering suboptimal distance learning conditions that, more than likely, deprived Mr. R's students of at-home academic socialization in ways associated with reduced attainment of positive learning outcomes in school settings (Hill & Tyson, 2009). And second, building off the aforementioned existence of systemic inequities in K-12 education, only 34.9% of parents in U.S. households with children were able to telework during COVID-19 and such an ability varied significantly by race/ethnicity and income (i.e., in a manner disproportionately affecting Black/Hispanic and low-income workers; Gould & Shierholz, 2020). When combined with the limited resources available across many school districts during the pandemic (ISTE & CMU, 2020), it could be argued that many of Mr. R's students may have come to develop feelings of incompetence or helplessness when learning using remote instruction, which may have contributed to their later showing greater detachment, decreased motivation and lower self-regulation during his instruction (Ryan, et al., 1995; Cherry, 2021).

In light of all the considerations listed above, there were several key takeaway points heeded regarding Mr. R's class setting during this study. First, it was deemed understandable – and, arguably, something to expect – that the 9th-grade students enrolled in Mr. R's course might be displaying varying degrees of engagement with his lessons at the start of the collaboration (i.e., during the 2021-22 academic year at the time of the planning discussions). And indeed, if such variation was found, it was seen as easily plausible that differences in resources and support made available to each of them by their preceding middle schools for online or hybrid learning during the pandemic played some role in causing it. Because of this, it was crucial to make sufficient space in the collaboration for brainstorming how Mr. R's implementation of CFT might be made more engaging for his students – not only in terms of how to highlight CFT's potential relevance for their future prospects (e.g., developing an ability to effectively navigate non-routine situations in future jobs; Gaskell, 2019), but also how to make the learning theory resonate with his students' lived experiences and interests (especially for those coming from marginalized populations, whose viewpoints might otherwise be unfairly overlooked; Tichavakunda & Tierney, 2018). Second, as noted before, the researchers explicitly stated that no student data would be directly collected for this study. However, they did strongly encourage Mr. R to share any meaningful anecdotes during the planning discussions (and write down any in-the-moment insights via journaling outside of them), for any patterns of thinking or behavior reported by Mr. R were regarded as pivotal for getting a better sense of what might be expected when more formally introducing CFT/LICRA to high school students in future research – regardless of whether the learning outcomes observed by Mr. R were positive or negative. And third, in response to Mr. R's transparency regarding the high proportion of students of his who were disengaged within his classroom setting, the researchers made it a point to direct Mr. R to focus on the students of his who were actually engaging with his lessons. As noted by the CFT Expert, "we don't care about the ones who have checked out, who aren't there or aren't paying attending"; but rather, for the purposes of making the most of the collaboration in relation to the dissertation's aims, focus was placed on discovering "how to make (CFT) better for whatever we see for the best" (PD3, 53:48-54:13). However, that is not to be conflated with students who were actively participating but showing signs of overly reductive thinking (e.g., oversimplifying, identifying something as "the only right perspective"; PD3, 54:21-54:38), for Mr. R was strongly encouraged to share what seemed most effective for them.

With these considerations of Mr. R's classroom setting in mind, this study was submitted to MSU's IRB Office and "determined not 'research'", due to the study method being designed in a manner that (a) did not have "a systematic design" that would "contribute to generalizable knowledge", thus not qualifying as "human subject research"; and (b) was "not likely to adversely impact students' opportunity to learn required educational content or the assessment of" Mr. R as a high school teacher within his school district (MSU HRPP, n.d., n.p.). In turn, while this dissertation is intended to inform future

research about how teachers and researchers might come together within communities of practice to promote non-reductive translation of theory into practice, the researchers did not interact with Mr. R's students or his school specifically at any time during the study, and emphasis was strongly placed on making sure that anything shared by Mr. R about his classroom setting (e.g., via anecdotes) was strictly journalistic in nature and thus did not include any identifiable student information or their direct work.

2.3: Materials

As the planning discussions were set to begin, the researchers initially held an interest in sharing resources with Mr. R that might assist in familiarizing him more fully with the theoretical framework of CFT/LICRA (e.g., Spiro, et al., 1988; DeSchryver & Spiro, 2008). However, during the first discussion (PD1), Mr. R opened up about the "constant pressure" he was experiencing as a teacher to "get standardized, to adhere to the standards, to follow the standards, to test the standards and make sure that, you know, your assessments match the standards" (PD1, 48:57-49:11). In response, building off the design research methodology utilized for this case study and his desire to not overburden Mr. R, the CFT Expert initially suggested that Mr. R just "read something short about CFT" that was written after an interview with him (i.e., the aforementioned article by New Educator, which briefly summarizes the CFT Expert's research regarding the benefits and potential uses of CFT for learning, including via use of emerging digital technologies), which could be "read in 20 minutes or whatever" (PD1, 1:21:27-1:21:44).

But upon further reflection, while offering feedback on a PowerPoint presentation of CFT/LICRA proposed by the PI to share with Mr. R at their next discussion (i.e., during a one-on-one Zoom meeting on January 15, 2022 that was aimed at preparing for PD2), the CFT Expert expressed concerns to the PI about "how far we can push him without (him) breaking". With this in mind, in the effort to center the collaboration around what works best for Mr. R's "reality" (PD1, 45:46-46:04), prioritization of sharing CFT/LICRA-related materials during the collaboration was proactively and substantially reduced. More specifically, the researchers mutually agreed that efforts to reduce Mr. R's workload for the purposes of the collaboration should be extended further by limiting information shared with him about CFT/LICRA to (a) a list of 7 +/- 2 "key things" (i.e., relevant facets of CFT) that would be curated and shared with the aim of informing Mr. R before he implemented CFT/LICRA within his classroom setting (with emphasis on making sure that "each one covers a lot of ground" and that they collectively "cover the waterfront"); and (b) a "specific application of mindset" to suggest that Mr. R introduce during his lessons, namely a hypothetical "teaching exercise involving LICRA" (as will be discussed further in "Procedure"). [Note: It is worth reiterating that space was given for this stance by the researchers to itself change or evolve over time as well, depending on how subsequent interactions across the collaboration ended up unfolding.]

Regarding the former, during subsequent email correspondence before PD2 (on January 16-17, 2022) and building upon his prior examination of CFT literature, PI shared a tentative list with the CFT Expert to potentially share with Mr. R, which included three overarching "common themes" of CFT:

a. "flexible storage of multiple conceptual frameworks/relations" when forming knowledge;
b. "prioritizing case-centeredness" when learning ISDs; and
c. "embracing contextual/situational dependency" when applying one's knowledge.

In addition, the PI provided a tentative catchphrase and 2-3 corresponding "cognitive values" anchored in preceding CFT literature (e.g., Spiro, et al., 2019) to accompany each "theme". [Note: See Appendix J for the first draft of the "cognitive values" proposed by the PI to share with Mr. R.] In response, the CFT Expert noted that there is "a single wholistic CFT" reflecting a "wholistic epistemic stance", with each cognitive value able to be regarded as a "different" but equally valid "'partial synecdoche' of the whole". Thus, from his perspective as the originator of the theoretical framework, CFT *in principle* cannot be grasped "with a single definition", but rather, is best understood through integration of "different perspectives, each revealing *aspects* of the whole". Beyond this, he extolled the importance of explaining to Mr. R not only the cognitive values' "interacting" and "interrelated/interconnected" nature (i.e., "for any pair or larger grouping of cognitive values, you can always write a 'CFT sentence' that joins them"), but also that their ability to "shade into each other" is "an essential property of CFT" that would make any attempt to rigidly place them into siloed or distinct categories conceptually inappropriate.

With such rationale laid out, the CFT Expert explicitly acknowledged that there are "many, many ways to slice", combine and apply those cognitive values in a manner that is "greater than the sum" of its parts. That being said, he argued that while those ways could be regarded as "all 'true' and all useful, in varying degrees", the degree to which a specific approach is true or useful "depend(s) on the CFT application". In other words, while "there can always be a different list" of CFT values that is created or shared, the needs of the situation at hand should inherently play a central role in directing which "list" is ultimately utilized. And for the purposes of this study, the CFT Expert postulated that the key goal of "application" was not only to provide something that Mr. R could "'take in'" or memorize, but also to lay it out in a manner that Mr. R could easily retain as a "constant mindset when thinking about his teaching…or when teaching". For example, when discussing how many cognitive values to share with Mr. R, the CFT Expert noted that while 8 might be "too much", sharing too few (i.e., 3 or less) would lead to "too many things get(ting) mushed together and key ideas (not) stand(ing) out" like they should.

Thus, he encouraged the PI to "shoot for something in the 4-6 range", in order to make each value "memorable" and able to "tell a different story (with each story capable of involving all the others)"

without being too overwhelming. In turn, once appropriate edits were made to the list of cognitive values in response to the CFT Expert's feedback (see Appendix K), he suggested that the PI simply share the "catch-phrases" with Mr. R during PD2, in order to "see at a glance how little we are giving him, how simple it is" - thus minimizing the risk of Mr. R ultimately coming to "feel overwhelmed" by the collaboration "at a busy start of the semester". Finally, the "cognitive values" were framed by the CFT Expert during the collaboration itself (PD2, 25:03-25:32) as "just things (for Mr. R) to keep in mind" during the instruction he was already doing, in hopes that said values might (a) become "habitual" for him to think of and refer to over time; (b) serve as a resource that, when used, could add "another light…, (or) add a wrinkle" of complexity to what he "already" knew and did in his class; and (c) provide a reference point for formulating alternative pedagogical approaches when his "hands are tied because of the standards" imposed on his teaching by outside sources (e.g., school administrators, state standards). From a researcher standpoint, it was envisioned that if Mr. R could integrate those values in such a manner without it being too burdensome on him, then his identification of any notable "examples" where those "cognitive values" appeared to impact his classroom context (e.g., when Mr. R was able to "get students to see just a little bit more" of such ways of thinking, or when he began to be more "automatic" in thinking of them himself) would be an crucial source of "data" for the study's aims (PD2: 31:02-32:30).

With such considerations in mind, revisions were made as needed and a "CFT Cognitive Value Catchphrases" slide was ultimately created to share with Mr. R, such that the "cognitive values" were represented by "catchphrases" meant to serve as "helpful little reminders" or "shorthand", in order to make it easier for him to refer to the values to "guide (his) thinking" (PD2, 19:02-19:08; PD3, 4:49-5:36). It is worth noting at this point that while the initial version of the slide (shown during PD2) included the first six "cognitive values" conceived by the researchers, in the spirit of design research, two more were eventually added. The seventh was added at the CFT Expert's recommendation (via email on February 23, 2022) and thereafter discussed during PD3, while the eighth was spontaneously added during PD6 in response to insights shared by the collaborators with each other at that time (see Appendix L for the final version of the PowerPoint slide with the "catchphrases" that were presented to Mr. R). The eight "cognitive values" (and "catchphrases") developed for the purposes of this study, along with the explanation for each "value" given to Mr. R by the CFT Expert during the collaboration, were as follows:

- **<u>Cognitive Value #1:</u> Embrace the complexity of concepts, including the feature of interconnectedness between concepts**
    - *Catchphrase:* "It's Not That Simple!"
    - *Summary:* This value involves avoiding "pat answers" to complex topics (e.g., saying Archduke Ferdinand's assassination caused WWI). While the CFT Expert did not expect

"full complexities" from "high school kids", he did extol the merits of helping them identify "minor…, manageable, easy" complexities, such that they eventually develop a "mindset" of not "settling" for "simple" answers that rely on formulaic use of knowledge or reducing the topic to "Here's what I'm gonna answer on the test". (PD2, 19:38-20:32)

- **<u>Cognitive Value #2:</u> Consider context-dependency in conceptual meaning/understanding and knowledge application**
    - *Catchphrase:* "It Depends!"
    - *Summary:* Building upon concerns related to oversimplifying definitions of historical concepts like "justice" or "freedom", this value recognizes that some concepts have "a zillion definitions", such that "a lot of context" is needed to discern how they might be defined within a specific situation. And as noted by the CFT Expert, this notion that defining complex concepts "depend(s)" on the context can foster a much more nuanced approach to learning history (e.g., "justice means three different things in three different contexts", which can each be explored on the Web using LICRA). (PD2, 20:34-22:18)
- **<u>Cognitive Value #3:</u> Strive for openness when understanding concepts, and flexibility when applying them**
    - *Catchphrase:* "Be Open in Understanding Concepts, and Be Flexible in Applying Them!"
    - *Summary:* For the purposes of fleshing out this facet of CFT, "open" does not simply mean being "open-minded…(to) other points of view". Rather, it denotes that concepts like justice or freedom are *themselves* "open", namely by being "tailored to different historical events" that each apply them differently (rather than their being fully captured by a "closed…definition in three sentences"). For instance, the notion of "freedom" applied in ancient Rome was not the exact same as how it was defined in other historical contexts (e.g., the Civil War, WWII). And naturally, such "openness" should not only shape our approach to trying to understand concepts, but also compel us to be flexible when "applying them" to different situations, since you cannot always assume that how you should apply a concept like "freedom" in a new situation will perfectly align with the way best suited for situations or "things that you've seen before". (PD2, 22:19-23:18)
- **<u>Cognitive Value #4:</u> Develop a mindset suited to manage ill-structuredness (e.g., irregularity, variability, unpredictability, novelty)**
    - *Catchphrase:* "Be Ready for the Unpredictable and New, the Non-Routine, the Unique!"
    - *Summary:* To the CFT Expert, humanity cannot predict the future because "everything is always new", and that we "would have (set up such a system) by now" if we could. With

that in mind, this value eschews the notion that everything needs to "fit some script" that is predetermined about how a historical event should unfold (e.g., relying on a "'How Wars Start' script" to gauge how a current conflict might break out into war). This is not to say "elements of the past" cannot be "useful" to learn from, but rather, we should always be ready for the novel and unexpected to occur as well. (PD2, 23:18-23:44)

- **<u>Cognitive Value #5:</u> Adaptively assemble knowledge in situations as they arise (rather than relying on "rigid" retrieval from memory) [Note: corrected for grammatical error]**
    - *Catchphrase:* "What Does the Situation Call For?"
    - *Summary:* Identified as "in a sense, …the most important one", this value emphasizes that the "heart" of cognitive flexibility is "about the situation, adaptive flexibility and applying knowledge". Whether a student is simply trying to more deeply understand a "world event" that is hard to comprehend or writing an essay for class, there can often be a temptation for them to look back on a prior event (or group of events) to guide their efforts to learn about the topic being taught. But building off the example of how various preceding events were cited by Kennedy's advising team during the Cuban Missile Crisis (e.g., Chamberlain's appeasement in 1938; Korean War), the CFT Expert noted that the Cuban Missile Crisis was "kind of like all those and kind of not like all those". Similarly, when we encounter a "new situation", our priority has to be placed on properly adapting "our prior knowledge and experience" to fit that particular situation. (PD2, 24:59-26:52)
- **<u>Cognitive Value #6:</u> Pay attention to the individual case (event/situation/example) at hand**
    - *Catchphrase:* "Cases Come First!"
    - *Summary:* In more "predictable" and "orderly" (i.e., well-structured) domains of knowledge, once you grasp a particular concept (e.g., in multiplication, "6x7 is gonna work the same as 5x8"), there is an ability to "apply those same rules in the same way" across all situations. Put another way, for WSDs, "examples help you to get the concepts, get the rules". But it's the opposite for ill-structured domains like history, where you "can't generalize from the cases" due to their inherently unique and complex nature. On the contrary, concepts associated with ISDs must be "weave(d) *through* the cases, rather than cases getting nested under" them, for they are *in principle* not applied in the same way across different contexts. Thus, for learners to truly understand them, they must be prepared to apply them in ways "tailored to the cases", rather than trying to "abstract away" from them. For instance, WWI has to be "understood on its own terms" (e.g., how "international relationships, different countries' interests, economic interests,

border interests" came into play during that particular period) and cannot just be lumped together or blindly "interchanged" with other wars like WWII. (PD2, 26:53-29:56)

- **<u>Cognitive Value #7:</u> Search for multiplicity (e.g., considering the validity of multiple possible answers, looking at things from multiple perspectives, etc.)**
    - *Catchphrase:* "Think Multiple Instead of Single!"
    - *Summary:* This value postulates that looking for a "single right answer, single best way to look at something, single cause" denotes a "reductive bias" detrimental to one's learning goals in history or other ISDs. In a manner frequently enabled by standardized testing or school-based assessments, students often fail to notice any issue with seeking "the single" answer to complex questions, leading to an oversimplified understanding that can impact their outlook even into adulthood (e.g., responding to unprecedented historical events as they arise). Thus, encouraging students to look for "multiple answers" to complex questions, "multiple perspectives" about a topic and/or "multiple causes" of an event was framed by the CFT Expert as an "epistemic stance" that could ultimately serve as an antidote of sorts – namely, for when they hold an ill-informed mindset towards learning and applying historical knowledge to novel and complex situations. (PD3, 5:36-7:14)
- **<u>Cognitive Value #8:</u> Avoid relying on reductive "either/or" thinking (e.g., when trying to learn about, understand or apply one's knowledge of historical figures or events)**
    - *Catchphrase:* "Don't Think in Black and White!"
    - *Summary:* As conversation during PD6 homed in on the moral ambiguity often displayed by prominent historical figures (e.g., Pinkerton), the CFT Expert extolled the potential merits of adding one more sentiment to the catchphrases – namely, that the "gray area is where a lot of the world (naturally) resides". Building upon (a) the complexity of cases like Les Misérables's Jean Valjean stealing bread to feed his family "starving at home"; and (b) Mr. R's own unwillingness to choose a career that would force him to rigidly place people into categories like "criminal and non-criminal" (as will be further discussed later), the collaborators mutually gravitated to the notion that if Mr. R utilized "anti-compartmentalization" to identify "examples" of nuanced historical figures or events to cover in his lessons, such efforts might discourage his students from prematurely settling for superficial evaluation of others or the world around them. Thus, an eighth value was added to support the notion that "nothing is that *clear cut* in history" and that "black and white…either/or…dichotomous…(or) binary" thinking should be avoided, even when such a mindset might be promoted by media or other institutions. (PD6, 41:02-47:47)

As alluded to earlier, Mr. R was encouraged by the researchers to build off those eight "cognitive values" by journaling anything he "happen(ed) to notice" over the course of the collaboration "on top of the good things" he was already doing within his classroom setting (PD2, 30:40-30:51). Put another way, whether it involved Mr. R documenting how his students responded to a certain integration of CFT/LICRA during his lessons or any in-the-moment insights he had related to their learning and/or his own instruction (e.g., as an example, the CFT Expert suggested that Mr. R might write, "I bet the students aren't really quite getting the 'It Depends" notion here, so I'm going to emphasize it a little more."; PD2, 30:51-30:59), any observational data from him that could connect to those values was explicitly noted as being "crucial" for the dissertation (and the impact of its findings more broadly) due to the "concrete reality" that it would reflect and thus its inherent ability to tap into other people's humanity (PD1, 1:16:49-1:16:57). Beyond this, Mr. R was encouraged to share any supplemental resources with the researchers he saw fit (e.g., if he came up with any materials or prompts for possible learning activities involving CFT/LICRA). It must be noted that by nature of this study's design research methodology, a definitive list of materials shared over the collaboration (beyond what was provided in advance, such as Mr. R's "Call to Freedom" textbook) could not be determined ahead of time. However, any additional materials exchanged over the collaboration will be duly noted when discussing this study's findings.

2.4: Procedure

For each planning discussion, the PI began by communicating via digital means (email/phone) to identify potential meeting times that would be available for all parties, with particular emphasis placed on accommodating the CFT Expert and Mr. R's respective work schedules. Once a meeting time was identified, a Zoom meeting link was thereafter created by the PI for that specific appointment. It is worth noting that a virtual platform (i.e., Zoom) was chosen to conduct the planning discussions (i.e., PD1-PD6) for several reasons, including (a) the desire to avoid any public health-related complications related to local spikes in COVID-19 cases, which was particularly relevant while arranging the collaborators' meetings due to the emergence of variants like Omicron; (b) wanting to make the meetings logistically easier to attend, thereby making a wider array of meeting times potentially suitable for everyone involved; and (c) hoping to document each discussion in as efficient and high-quality a manner as possible, namely through use of Zoom's ability to record each meeting (and Temi's transcription services). In line with this, a distinct Zoom meeting room (and corresponding link) was created before each discussion, in order to ensure proper confidentiality (i.e., through setting up a password needed to access the meeting) and verify ahead of time that the meeting would be automatically recorded on the PI's local computer.

Along with the relevant Zoom link, the PI also sought to share any noteworthy information about the upcoming discussion that the collaborators might need to know. To begin, at least during the planning discussion period, it was confirmed to the collaborating parties that the Zoom meeting rooms were

scheduled to be usable for 2 hours in length. This arrangement was made out of an abundance of caution, in order to prevent the discussion from being closed prematurely by the Zoom platform.[3] In addition, for PD1-PD3, a meeting agenda was shared with the CFT Expert and Mr. R to inform them about the topics of interest that were set be explored or covered during their upcoming discussion. However, building upon the design research methodology being utilized for this study, it must be emphasized that a certain amount of flexibility was integrated into the discussions, in order to facilitate more natural flow of conversation between the teacher and researchers. Such adjustments included, but were not limited to, not being overly rigid about discussing topics in the specific linear order they might have been listed on a given agenda, allowing some topics to be discussed over email for the sake of convenience or limited time in the meeting (e.g., questions about Mr. R's classroom context that came up during PD2, although they were also discussed more thoroughly during PD3), or not knowing the answer to a particular question (e.g., Mr. R not being sure about district/state standards in PD3). And as alluded to previously, upon the recommendation of the CFT Expert, it was eventually decided that the PI should not distribute agendas at all during PD4-PD6 and instead have them "handy" for personal reference (May 5, 2022). Finally, while such an occurrence rarely took place during the planning discussions, there was also flexibility offered for any member of the collaboration to share supplementary materials that they might deem relevant for an upcoming discussion (e.g., link to a YouTube video, recent news article).

Despite this strong emphasis on maintaining flexibility and making adjustments accordingly, the planning of the collaborative discussions remained broadly and consistently guided by several key principles, including (a) the shared acknowledgment by the teacher and researchers of a severe need in U.S. education for learning goals that are tied to 21st century skills and future workplace needs (e.g., an ability to manage complexity and adaptively respond to novel situations or problems; World Economic Forum, 2016); (b) the consideration of a theoretical framework intended to facilitate achieving those goals (i.e., CFT, along with LICRA as a Web-based form of CFT learning); and (c) an ongoing recognition of Mr. R's teaching goals, as well as the need to center the collaboration around supporting his teaching needs and whatever constraints he might need to navigate within his unique classroom context.

In this sense, the planning discussions were intended to balance proper use of a communicative framework intended to centralize and build upon mutual understandings found between the collaborators with allowance of space for the progression of the collaboration itself to inform what might be discussed. With this in mind, the first few planning discussions (i.e., PD1-PD3) were first and foremost intended to bring forth any information that might be relevant for the development of this dissertation's study design, including whatever might better ensure its proper alignment with Mr. R's "reality" as a teacher and his

[3] Ultimately, PD1 and PD2 ended up lasting roughly 90 minutes, while PD3-PD6 lasted roughly 60 minutes each.

resultant capacity to contribute during the collaboration. This included, but was not limited to, (a) identifying "mutual understandings" between the teacher and researchers' perspectives that could thereafter inform their subsequent collaborative efforts (e.g., constraints that might impact Mr. R's ability to implement CFT/LICRA within his classroom setting); (b) obtaining up-to-date information about the manner of instruction being used by Mr. R (e.g., his classes being fully in-person as of February 2022, as reported during PD3); (c) identifying considerations that should be made by the researchers in order to not overly burden the teacher (e.g., not collecting any "formal measures of student learning gains" for the purposes of this study; PD1, 1:14:10-1:14:14), and (d) making note of any initial attempts to brainstorm which learning activities might or might not be feasible to integrate into Mr. R's curriculum. In turn, even as agendas for those three discussions were shared before each meeting, priority was given to not unnecessarily exhausting the collaborators on any given day, namely by tabling any unaddressed topics from one meeting's agenda until the next meeting until all necessary topics for Stages 1-2 were covered.

For the remaining planning discussions (i.e., PD4-PD6), by nature of the design research methodology utilized, the resultant need to defer to insights made from details shared by Mr. R about his teaching "reality", and the aforementioned recommendation of the CFT Expert, a definitive outline or agenda was not developed or distributed to the collaborators ahead of time. However, when preparing for those discussions, tentative agendas were written out and referred to by the PI himself for self-monitoring purposes. In particular, the PI prioritized using each discussion to address specific topics corresponding with each SQ laid out for this dissertation, while also integrating a "try it out" mentality related to both identifying strategies for implementation of CFT/LICRA's theoretical framework within Mr. R's classroom setting and "reporting how things go" as the collaboration unfolded (March 9, 2022). On the one hand, during PD4 (i.e., Stage 3), this largely entailed building off key "mutual understandings" found during the first three planning discussions to brainstorm what strategies might be utilized by Mr. R to "translate" CFT/LICRA for the purposes of his U.S. History instruction – whether that involved explicitly introducing the theoretical framework itself (i.e., as *its own* lesson), emphasizing facets of CFT across different stages of his preexisting curriculum (i.e., *during* a given lesson), or covertly incorporating such principles into his own pedagogical framework (i.e., *in preparation* for his lessons). In this sense, PD4 specifically was crucial for capturing the collaborators' mentality *before* initial efforts on the teacher's part to integrate CFT/LICRA into his classroom instruction, thus documenting the onset of a reciprocally influential relationship between the collaboration and the learning context that it was created to support and brainstorm strategies for (including its constraints and Mr. R's methods of navigating them).

On the other hand, the discussions associated with PD5-PD6 (i.e., Stages 4-5) were planned as an opportunity for the collaborators to respond to what Mr. R reported related to said initial efforts. This included offering space for Mr. R to share how the collaboration seemed to affect his instruction (e.g.,

through sharing anecdotes from his classroom setting and/or his preparation for it), as well as space for the collaborators to reflect upon the degree to which they perceived CFT/LICRA as complimentary or at odds with Mr. R's pedagogy and what that might foretell for future iterations of the collaboration. In a manner meant to acknowledge both the unique teaching conditions that Mr. R needed to navigate and those "constraints and limitations" that Mr. R was "not unique" in being frustrated with from the researchers' perspective (e.g., standardized testing; PD1, 52:35-53:02), it was hoped that planning the discussions in this way could not only give an initial sense of where Mr. R envisioned CFT/LICRA being more (or less) useful for his students, but also informally lay groundwork for a shared vision between the collaborators regarding how to navigate challenges related to its future integration within Mr. R's classroom setting specifically. For example, if Mr. R hypothetically reported that his students were oversimplifying complex historical topics (e.g., noting a "single" cause of WWI), then that could spur the collaborators to brainstorm how CFT-aligned patterns of thinking might be promoted to combat such reductivism (e.g., looking for "surprising" similarities and differences between different wars; identifying which contexts certain historical concepts (e.g., freedom) were "most pertinent" in and how; Spiro, et al., 2017, p. 634). Alternatively, if he reported that some students were struggling to distinguish reliable from unreliable websites, then the collaborators might instead focus on designing Web-based learning activities around that learning challenge (e.g., by incorporating LICRA principles into a given assignment's rubric).

At this point, it is critical to emphasize that specific formats of instruction and/or learning activities for implementation of CFT/LICRA within the teacher's classroom setting *were not* developed or finalized for the teacher to use ahead of time (i.e., before the first planning discussion), nor could they be. This is because the use of design research methodology made such details *in principle* unable to be predetermined, for even as this study's collaboration sought to explore which teaching strategies *could* be utilized, it was centrally built upon the foundation of respecting Mr. R's autonomy and sole discretion in deciding which brainstormed ideas should ultimately be implemented *within his classroom setting.* However, a portion of PD1-PD6 was aimed at brainstorming which types of instruction and/or learning activities *might* be feasible or infeasible to consider under Mr. R's existing teaching constraints. For example, one potential learning activity brought up by the CFT Expert early in the collaboration (PD1, 50:32-50:43) involved a Web-based activity he knew was previously implemented in Mr. R's lessons. More specifically, this activity consisted of giving students a link to a self-contained website, which would provide a set of information needed to respond to a "Document Based Question" (DBQ) about an ill-structured historical topic. For that assignment, students would be *asked directly* to do the following:

a. provide their answer to the ill-structured prompt given for the DBQ;

b. share their reasoning behind the answer(s) they provided for (a), including citing the sources of information they used as "evidence" for their answer(s) and laying out how they conducted their exploration of the topic (e.g., which sources they visited and in what order); and
c. share what their thinking, attitudes and behavior were like during the learning task, including where they faced difficulties and how their mindset changed (if at all).

As pertains to this collaboration's aim to brainstorm strategies for integrating CFT/LICRA into Mr. R's teaching practices, such an activity was briefly discussed by the teacher and researchers before Stage 1 when ascertaining how Mr. R might be involved in the study (i.e., when learning about his preexisting teaching practices and gauging his potential receptiveness to CFT as a learning theory). In particular, at one point while preparing for this study (i.e., before research-based and COVID-related considerations warranted adjustments to the methodological design that eliminated use of direct student data), the PI considered using a modified version of the DBQ assignment (with specialized directions involving use of CFT/LICRA) as a possible means to integrate CFT into Mr. R's classroom setting. [Note: See Appendix M for a description of the website layout that would have been used for the DBQ assignment, Appendix N for instructions written to be shared with Mr. R's students, and Appendix O for "CFT/LICRA Tips" that would have been included on a subpage of the DBQ site.] However, Mr. R pointed out in PD1 that his class was "probably not gonna have time" for that task during the academic year when the planning discussions took place; and as stated by the CFT Expert, such a development further justified the need to center the collaboration around exploring how CFT might become "part of the learning theory" informing Mr. R's work "*given the constraints (he was) operating under*", rather than entering with a rigid sense of which learning activities should be implemented within his classroom for this study (PD1, 50:43-51:15).

With such a consideration in mind, even as the CFT Expert indicated (after learning about Mr. R's "constraints") that the teacher could "forget" about reading the "interview paper…about pioneering" (i.e., New Educator, 2002) or other CFT papers for the collaboration, he also proposed a "specific exercise application" that could help encourage a more "general" change in his students' "epistemological mindset" with the CFT "catchphrases" in mind (PD2, 1:20:16-1:20:56; 1:26:00-1:26:11). The learning activity, which would focus on the third CFT "catchphrase" specifically (i.e., "be open in understanding some of these concepts"; PD2, 1:26:11-1:26:22), would involve taking "any (ill-structured) concept" that corresponds to a particular unit or historical topic that Mr. R's class might be covering at the time (e.g., "nationalism" or "alliances" during WWI, use of "propaganda" or "civil disobedience" during the Civil Rights Movement, "capitalism versus communism" in relation to the Cold War; PD2, 1:30:46-1:31:48). From there, in a manner intended to help "edge (students) away from looking for facts" or the single best way to understand the concept at hand, the exercise would ask his students to "get on the Web", to learn

about what it means *and* "how it might apply to the unit you're working on" (PD2, 1:20:49-1:21:46). Finally, once his students found a meaning of the concept that they liked and wrote "one paragraph" (or "three or four sentences") about that meaning (PD2, 1:27:20-1:27:36), they would be told to "go on the Web and find something else" – namely, some other valid meaning or understanding of the concept – and then write another paragraph built upon that second meaning (PD2, 1:21:47-1:22:00). As noted by the CFT Expert, by getting Mr. R's students to "dig deep" and explore how a historical concept "can be seen differently by different people", they could experience a "little incremental opening" in their mindsets through better appreciating how some things "don't just have a single meaning" (PD2, 1:26:45-1:27:41).

While further details about this proposed exercise (and what Mr. R ended up doing following suggestions like these by the researchers) will be shared in the "Results" section, it is summarized at this point to highlight several key points about how the collaboration itself unfolded. To begin, *Mr. R was never told that he needed to complete this or any other exercise or learning activity within his classroom setting as a condition of participation in the collaboration*. This is not to say that the merits of proposed learning activities were not alluded to. Indeed, building upon online learners' natural and oft-observed tendency to use the Web to "find answers" that "spare yourself the trouble of thinking", the CFT Expert noted that using LICRA could help Mr. R students "start…down the path" of seeing that "there could be two answers" and that "there isn't a single right answer to everything", even if it would be unlikely that their mindsets change "all the way" as a result of one exercise (PD2, 1:29:00-1:29:37). But it was always up to the teacher to decide which suggestions raised during the collaboration to heed and what might be entailed in meaningfully applying them within his classroom. Second, *the highest priority was given to centering the collaboration's evolution over time around whatever meaningful anecdotes or information Mr. R chose to share*, in a manner that could not be planned ahead of time. For instance, the researchers found it important to share key considerations for CFT/LICRA, such as pointing out that if Mr. R's students did not adequately grasp the complexity of a topic "with (their) first search" alone, they might need to conduct additional search queries (e.g., making search terms "a bit more specific to narrow in") to ultimately "find what (they're) looking for" or what Mr. R was asking for (PD2, 1:29:42-1:30:04). Nevertheless, the researchers maintained a position of being proactively prepared to respond to whatever insights Mr. R himself might bring forth, whether they involved Web search strategies or otherwise. And third, *it was vital for the researchers to anchor their suggestions around the "reality" shared by Mr. R and to do so in an ongoing manner*. In particular, while brainstorming the above LICRA exercise, after Mr. R acknowledged that concepts like "justice" or "freedom" do not come up "in a real way" in his curriculum even while covering the Civil Rights Movement (PD2, 1:23:02-1:23:30), the CFT Expert built upon that by suggesting that the title of Mr. R's textbook ("Call to Freedom") could be used to justify using "freedom" for the exercise and to do so "towards the end of the school year" (PD3, 55:08-56:06).

But even at that point, it was understood that it was up to Mr. R to discern, based on his expertise within his "reality", whether "freedom" would work best or if another concept might be more appropriate.

Once each planning discussion between the collaborators was completed, the PI sent a follow up email to Mr. R and the CFT Expert, in order to address any remaining issues as needed depending on how the discussion unfolded. Such messages could include, but were not necessarily limited to, asking follow-up questions that could not be addressed during the discussion itself (e.g., asking Mr. R questions about his classroom context following PD2), providing a recap of courses of action for each collaborator to complete before the next discussion (e.g., offering a reminder to Mr. R to continue journaling any in-the-moment insights that he might have related to implementation of CFT/LICRA within his classroom), and sharing any necessary resources referred to during the discussion (e.g., New Educator article after PD1; updated PowerPoint slide after PD3). In addition, during such emails, all parties were also asked to check their schedules and let the PI know what meeting times might be available for their next discussion.

2.5: Analysis

Transcript data from the planning discussions were examined incrementally for this study in a manner that incorporated several key steps, including (a) making necessary edits to the Temi-generated transcripts, which were verified while listening to corresponding video recordings produced by Zoom; (b) identifying and outlining the "greatest hits" or noteworthy events from PD1-PD6 (e.g., key dialogue exchanged between different collaborators, information shared by Mr. R about his classroom setting, additional resources shared by the teacher or researchers with each other) across all segments of the discussions being examined; and (c) completing multiple cycles of in-depth qualitative analysis for each segment, with the aim of acquiring a rich interpretation of the data in relation to both the evolving nature of the collaboration itself and how such data might serve to address this dissertation's sub-questions.

Regarding steps (a) and (b), they were underpinned by a shared desire by the researchers (as worded by the CFT Expert with the PI in correspondence from September 2, 2022)[4] to effectively hone in on topics most suitable "for recapitulation and deepening" from PD1-PD6. Building upon this, the PI laid out three top priorities for data analysis of transcripts from PD1-PD6 for the purposes of both this study and later iterations of the collaboration, including during a planned future "debriefing" session with Mr. R intended to serve as part of an expansion of this study for publication purposes (September 5, 2022):

a. "recapitulating and deepening…points" regarded as the "'greatest hits'" from PD1-PD6;
b. explicitly laying out any questions that "either 'didn't come up well or enough'"; and

[4] It is important to note that within this manuscript, for clarity, parentheses will be used to time stamp excerpts from relevant email correspondence exchanged for the purposes of this study (e.g., between the CFT Expert and the PI).

c. adding questions that could "more explicitly connect ideas discussed…back to the [SQs]" in original form or "modified as needed".

In order to analyze the transcript data in this manner, several key steps were implemented (as summarized by the PI on November 27, 2022). To begin, upon completion of the six planning discussions over Zoom, the resultant video recordings were downloaded to the PI's local computer and thereafter uploaded to Temi (https://www.temi.com/), an AI-powered speech-to-text transcription service. Temi was chosen for transcribing the discussion data for several reasons (Brewster, 2020, n.p.), including (a) it being recommended by the New York Times as "the easiest to read among the AI-based options" available; (b) its relative affordability at $0.25 per minute of transcription at the time of the study, (c) its ability to return a generated transcript for a video recording within minutes, in a manner both saved to one's Temi profile and sent to their email address; (d) its reasonably high reliability (rated as "about 75%" accurate by NYT and "90-95%" by Temi) under conditions that allow for "good audio" (e.g., little background noise, clear speaker(s) and minimal accents, according to Temi); and (e) its built-in text editor that is in sync with the recording to allow for easy navigation and "clean up (of) the completed transcript" (n.p.), either on the Temi site or by downloading the transcript as a Word document.

As explained by the PI (November 27, 2022), after the transcripts were downloaded and edited (e.g., correcting typos, color coding who spoke which lines, cleaning up timestamps), considerable time was then spent identifying the most important interactions between the researchers and Mr. R to bring forth for further discussion between the three of them. Specifically, efforts were first made in a "Work Document" to (a) indicate the block of time to silo for each "hit"; (b) lay out what the most "relevant exchanges (and meaningful quotes)" were in a color-coded manner (i.e., with a distinct color representing each collaborator across all transcripts); and (c) brainstorm question(s) that might be appropriate to ask when debriefing about that particular "hit", as well as whether to direct such question(s) to one of the collaborators or all interviewed parties. Then, for the 57 "hits" (i.e., most meaningful excerpts pulled from PD1-PD6 for the protocol), a table was created in a "Question Document" to summarize the key details of those moments (e.g., timestamp, topic of conversation), while also making a "first attempt to filter out the questions" that would be "most worthwhile" to incorporate into future debriefing. Primarily for the purpose of being transparent regarding how such debriefing will unfold in the future expansion of this study, listed below are the four tiers of questions utilized for constructing the "Question Document":

- Tier 1: Must include, essential to "story" being told in dissertation (and answering [SQs])
    - Tier 1A: worth discussing but already addressed later in discussion
- Tier 2: Pretty valuable in telling "story" […] although it's likely best served as support for Tier 1

- Tier 3: Good for fleshing things out and adding more detail, although "story" is tellable without it
- Tier 4: Could be integrated if there was infinite time to discuss, but can be […] dropped if needed

Eventually, a "star/hashtag" prioritization system was used to organize questions in a more thorough and hierarchical manner. On the one hand, questions identified for introducing a new topic were either listed as "essential" (i.e., three stars), "supplementary" (two stars), or able to be "skipped or answered via email" (one star); and on the other hand, sub-questions (i.e., those placed under topic questions) were noted as "important to plan for" (i.e., three hashtags), "could be worth asking" (two hashtags), or able to be "skipped or answered via email" (one hashtag). [Note: Please see Appendix P for exact wording.] Further details about how the "debriefing" period will unfold, including the layout for the planned interview protocol, will be shared when discussing future research towards the end of this manuscript.

Regarding how the data was collected for this dissertation specifically, strong emphasis was placed on considering how best to integrate the data more broadly into a "cohesive and meaningful" framework and corresponding narrative for both the purposes of this study and for informing the collaborators' future work together (November 27, 2022). Put another way, it was considered crucial to approach data analysis similarly to the *ethics and principles enacted within the collaboration itself*. With this in mind, high priority was given to trying to capture a variety of dimensions and complexities in the perspectives initially held and shared by the teacher and researchers across the planning discussions, including the following factors of note: Mr. R's description of his classroom context (as well his sense of the state of teaching high schoolers both within his school setting and nationwide); pedagogical and/or theoretical frameworks identified as influential or relevant; initial beliefs expressed related to acquiring knowledge, learning and teaching (particularly in relation to Mr. R's classroom context and K-12 education more broadly); and resources and strategies shared for the purpose of better understanding CFT/LICRA and/or navigating Mr. R's particular classroom setting from a teacher's perspective. Eventually, attention was given to eight "mutual understandings" or "meeting ground(s)" (PD1, 36:04-36:20) regarded as meaningful by the collaborators *at the collaboration's onset* (i.e., during PD1):[5]

- Meeting Ground #1: The importance of "connectedness" in a teacher's (Mr. R's) knowledge, in terms of "bring(ing) things together" through "adaptive improvisational performance" rather than letting students see historical knowledge as "separated into separate chapters" (28:19-29:02)
- Meeting Ground #2: Looking "below the surface"; recognizing the "subtlety of difference" between historical events (e.g., WWI vs. WWII) (34:58-36:19)

[5] It is worth noting that the numbering of the "Meeting Grounds" represents the order they were mentioned in PD1.

- Meeting Ground #3: Use of historical "examples" and resources (e.g., showing the film "The Grapes of Wrath" to discuss the Great Depression) to encourage students to "think about things differently" within existing "constraints" like standardized testing (49:23-50:30)
- Meeting Ground #4: Recognition of the "constraints…limitations…(and) requirements" within the teaching context Mr. R navigates, as well as constraints "not unique" to him (51:15-53:02)
- Meeting Ground #5: Integration of psychological ideas tied to building "interpersonal relationship(s)", including Maslow's Hierarchy (56:41-56:55)
- Meeting Ground #6: Maintaining a "strongly anti-Platonist, anti-essentialist" mindset towards working with students by accepting that "every student that walks in the door is a…completely new, novel and complete and complex individual" rather than a "type" (59:08-1:00:04)
- Meeting Ground #7: Acknowledging, on an epistemological level, the "messiness" of "the real world" in relation to learning history (1:01:33-1:01:59)
- Meeting Ground #8: Sympathy for CFT that stems from its "real-world" relevance, namely due to "how the world operates" and that often being "contrary to how you're asked to teach about the world" and how "ed psych research on learning" discusses teaching (1:18:16-1:19:21)

But beyond building upon those "meeting grounds", in a manner largely discussed during two check-in meetings over Zoom between the PI and CFT Expert (May 11, 2023; May 22, 2023), emphasis was placed on centering the study around dissecting, as stated by the latter, "that communication process between teachers and academia, back and forth, each mutually understanding and mutually influencing to the benefit of each other, influencing each other"; and what was denoted as paramount for pursuing that goal was to "go back to trees you've developed" (i.e., "topics" identified as most promising from the 57 "hits"), "except look at every one of those trees now that you have mastery of the forest and keep that forest in mind". Thus, rather than relying on an overly regimented "specific thematic analysis, content analysis methodology that you have to tailor to", the PI was encouraged to simply "tell the story of the conversation" and let that direct the "development of mutual understanding" and methodology used.

With this in mind, in order to explain how qualitative data analysis was used to capture a "rich interpretation" of how the collaboration at hand unfolded for the purposes of this dissertation (i.e., step (c)), it is now necessary to further elaborate on the rationale and theoretical frameworks that underpinned such efforts. Building off the CFT Expert and PI's one-on-one conversations between late February and early March 2022 (via email and Zoom), high priority was placed on emulating I.A. Richard's approach to "close reading" in the "everyday" sense. More specifically, rather than being concerned with a particular literary lens or form of "literary analysis", the CFT Expert encouraged the PI to use Richards as a jumping off point to hold "the same mindset of 'digging deep'" – namely, by being vigilant for multiple

perspectives and meaningful "interconnections" that might emerge within the data (March 2, 2022). With this in mind, emphasis was placed on trying to build off the "analytic powers" promoted in Richards' method of "practical criticism" to avoid pitfalls that might otherwise impede a deep and meaningful examination of data obtained (Encyclopaedia Britannica, 2022, n.p.). Potential pitfalls noted for this study included (a) failing to make out the "plain sense" of data; (b) overlooking potentially significant sequencing and imagery in a person's discourse; (c) interpreting data in ways "already fully prepared in the (researcher's) mind" (i.e., in a manner that can ultimately lead to confirmation bias), rather than in ways more authentically derived from the data itself; and (d) relying on "general critical preconceptions" about a given datum's "nature and value", in ways that prematurely "cut off" a researcher from uncovering its deeper meanings even as "he is starving" to discover them (Richards, 1930, pp. 13-17).

Such a mindset encouraged *a theory-informed analysis* of the data collected across this study due to its alignment with CFT on multiple noteworthy levels. First, the CFT Expert was explicit in identifying an appreciation for complexity as essential for one's ability to properly grasp *the theoretical framework of CFT itself*, namely due to CFT being a "single (and) wholistic" concept that can only be grasped "from different perspectives, each revealing *aspects* of the whole", rather than through reliance on "a single definition" (January 16, 2022). And building upon this sentiment, he regarded a "close reading" of the study's data as "CFT-ish" and aligned with CFT's "central goal" of avoiding reductive understandings of complex situations, namely due to its emphasis on capturing "as much important real-world complexity as possible" *as it emerges* within a given text (March 2, 2022). Thus, emulating Richards' "close reading" of data was intended, in part, to instill a readiness to "dig deep" to more deeply comprehend the multitude and meanings of different CFT "aspects" that were brought forth across this study by the collaborators, including making note of the specific contexts from which they emerged.

Second, an approach centered on "close reading" was critical not only when chronicling what Mr. R reported about his efforts to implement CFT/LICRA within his classroom, but also when examining *how CFT as a learning theory was discussed as the collaboration unfolded* (e.g., mentions of CFT during exchanges of dialogue captured across the planning discussions, how it was described in materials exchanged between the collaborators). In other words, even as there was a need to document instances when Mr. R reported noteworthy trends related to CFT within his classroom setting from his students or even his own instruction (e.g., oversimplification of complex historical events or avoidance of such reductive patterns of thinking), it was also important to pinpoint moments when those same trends appeared to take place *during the collaboration itself*. For instance, at one point during PD1, Mr. R expressed his concerns about students being "very concrete thinkers" due to his associating such cognition with a "black and white" mindset (PD1, 1:02:10-1:02:19). In response, the CFT Expert interjected that "concrete is good, though"; and thereafter, he addressed that oversimplification by noting

how thinking in "concrete" ways is not necessarily bad and can even be preferable to thinking in more "abstract (and) generic" ways, namely due to it denoting a readiness to "understand that the world is messy" that the collaboration could "build on" (PD1, 1:02:06-1:03:08). And third, beyond being aligned with CFT in terms of what was explicitly discussed, a Richards-like "close reading" mindset also served as a means for CFT to underpin the *broader interpretation of data* from a methodological standpoint. Indeed, whether a given instance of data analysis involved regarding the perspectives simultaneously held by the collaborators with equal regard, considering multiple meanings that might exist for a line of dialogue, or monitoring for interconnections between different exchanges, there was a need for the data analysis itself to reflect a mindset that was "CFT-like" and non-reductive in nature (Spiro, et al., 1996).

To provide one example of how these several facets of theory-informed data analysis could intertwine, a noteworthy pattern that emerged for Mr. R during PD1 was his repeated use of expletives to express his frustration about different facets of his teaching context, including his students' lack of motivation ("they don't give a shit about anything"; 42:54-43:16) and overemphasis on standardized testing both within his school district and elsewhere ("the pressure is that the teacher has to show that there's growth on the same stupid fucking test"; 1:12:53-1:13:02). From there, it could be discerned that such displays of emotional vulnerability only emerged after a mutual sense of trust began to form between the collaborators – namely, from an extended amount of preceding time that consisted of not only discovering multiple "meeting ground(s)" between each other's perspectives, as repeatedly described by the CFT Expert (36:02-36:19; 1:00:07-1:00:35; 1:02:37-1:02:47), but also a concerted effort on the researchers' parts to explicitly frame the goals of the collaboration (including for the aims of this study) around learning more about and supporting Mr. R's "reality" (45:47-46:03). And even further, by homing in on "those constraints, those limitations, those requirements" inherent to Mr. R's teaching context (PD1, 51:15-51:21), another behavioral trend can be regarded as a direct response to Mr. R's frustrations. Namely, the CFT Expert eventually shifted from suggesting a "little article" for Mr. R to read about CFT "in 20 minutes or whatever" (1:21:30-1:21:44; PD1) to telling him to "forget about that little interview paper…(or) any CFT papers" (1:26:01-1:26:10) in PD2 and instead (alongside the PI) simply providing him "shorthand represented in…catchphrases" (PD3, 5:32-5:33) – a change in stance directly attributed to the CFT Expert's concern regarding how to help Mr. R internalize different facets of CFT without feeling too "overwhelmed", as shared with the PI in their email exchanges preceding PD2 (January 16-17, 2022).

So how does this interaction exemplify the multi-faceted theory-informed data analysis used for this study? To begin, it alludes to how the "catchphrases" were created to build upon different "cognitive values of the adaptive worldview" cited in prior literature (e.g., Spiro, et al., 2019, p. 962), including:

- Attuning oneself to the "variegated richness" of ill-structured cases and framing "concepts" as serving a "subsidiary function" for them (as embodied by catchphrases like *"It's Not That Simple!"* and *"Be Ready for the Unpredictable and New, the Non-Routine, the Unique!")*
- Utilizing "multiple…conceptual relations" rather than "single" (e.g., schemas, analogies, perspectives), in a manner that promotes "openness of knowledge representation over rigidity" in one's thinking (*"Think Multiple Instead of Single!"*; *"Don't Think in Black and White!"*)
- Avoiding "rigidity" in one's understanding in favor of being "open", namely by acknowledging "the sometimes limitless range of uses of knowledge in new combinations, for new purposes, in new situations" that is often possible when navigating a novel context, task or problem (*"Be Open in Understanding Concepts, and Be Flexible in Applying Them!"; "Cases Come First!")*
- Relying on "situation-adaptive assembly of prior knowledge and experience" to manage the context at hand, as opposed to a one-size-fits-all "retrieval of intact knowledge structures and procedures from long-term memory" *("What Does the Situation Call For?"*; *"It Depends!"*)

Second, this approach also makes note of how the researchers adjusted their expectations for Mr. R *and* for themselves as collaborators, an additional lens that enables this study to carefully and deeply examine the degree to which the collaborators exhibited *a metacognitive, multi-faceted behavioral adjustment during their time together that was itself CFT-aligned*! Specifically, it homes in on how the researchers opted for providing "direct instruction in worldview", namely by providing a "non-technical, jargon-free introduction/overview" of CFT and offering Mr. R the tools to "repeat" key facets "as a kind of mantra" to make them more digestible for him (p. 963). And indeed, if we refer to from Spiro, et al. (2019), evidence can be found regarding the origin of some of the catchphrases they chose to share (p. 963):

> "For example, given the prevalence of *oversimplification*, processing a concept or case in a reductive manner or jumping to an oversimplified solution, CFT instruction frequently invokes mantra-like reminders like "it's not that simple," or "it depends." When you hear these mindset mantras often enough, with a clear and present instance of oversimplification as the context and a demonstration of ways to think that would not be that simple (and how they contrast with the learner's reductive tendency), that mindset feature is quickly learned and adopted."

Finally, by using theory-informed "close reading" to orient analysis of such data in an inherently complex and interconnected fashion – namely, not only chronicling *what* topics the collaborators discussed, but also *how* they were discussed, the *deeper meanings* such dialogue might hold and how those meanings *evolved over time* – it was hoped that a CFT-aligned meta-readiness could be instilled in the strategies

utilized by the person *conducting the data analysis itself* (and arguably, given this study's use of design research, by the researchers and teacher together as they analyzed their emerging community of practice).

However, alongside Richards's notion of "close reading", another perspective must also be given its due recognition for how it impacted the qualitative data analysis used for this study. As pointed out by Saldaña (2016), the framing of a study's research questions denotes "the values, world view and direction of an inquiry", thus playing a role in shaping "what type of knowledge is going to be generated" (p. 71; citing Trede and Higgs, 2009, p. 18). With this in mind, since this study sought to be ontological in the sense of seeking to "address the nature of participants' realities", priority also had to be placed during "close reading" on utilizing a *grounded approach* to the data, namely by searching for "personal, interpretive meanings found within the data" that could validate and meaningfully reflect the "realities" being shared by the collaborators (p. 71). Why was this important for the purposes of this study? As noted before, this teacher-researcher collaboration was centrally built upon principles of mutual respect and equal footing, in terms of promoting a "shared" effort to derive meaning from their interactions (Herrenkohl, et al., 2010) and proactively dismantling any notion of the researchers being "more credible knower(s)" (Ulichny & Schoener, 1996, p. 503) of how to implement CFT (or any other learning theory) within Mr. R's classroom setting. Thus, coming in with a fully predetermined sense of the sorts of interactions or outcomes that would be worth noting (and which specific meanings might be derived from them) would be highly inappropriate *in principle*, largely due to it not leaving the door open for "previously unanticipated" meanings (Heydarian, 2016, n.p.) that could emerge from being receptive to what might be learned from the "processes, emotions, and values" (Saldaña, 2016, p. 16) that underpinned the teacher's "reality" and his interactions with the researchers. Even further, from a theory-informed standpoint, if an artificially "rigid" coding scheme was inserted to analyze data obtained across the study ahead of time, it could ironically lead to the very sort of reductive interpretation of data (and "cutting off" of potentially meaningful insights from considering multiple perspectives) that has been identified as antithetical to deep learning (and "close reading" of data) by CFT scholars and Richards himself!

With that in mind, building off both CFT's emphasis on maintaining an "open" mindset towards different perspectives and Saldaña's (2016) recommendations for how to "catalogue and better reveal" the "realities" brought forth throughout the collaborators' interactions with each other (p. 70), the first cycle of data analysis involved using "analytic memo writing" to more thoroughly elaborate and "help preserve participants' meaning" of key moments observed during each of the six planning discussions being examined (pp. 108-109). In particular, by methodically building off the "actual language found in the qualitative data record" to "prioritize and honor (each) participant's voice" (e.g., shifts in voice or actions, like vocal emphasis or using fingers to denote quotations; use of vocabulary that is "evocative" or "often used"; etc.) and anchoring grounded interpretations of the data around said dialogue, it was hoped that an

"in vivo" understanding of how the collaboration unfolded over time could be meaningfully obtained (pp. 105-107). For example, from the beginning of the first discussion, the CFT Expert made it a point to discern what might be a part of Mr. R's "personal epistemology" as a teacher, eventually acknowledging as a "meeting ground" Mr. R's desire to help his students (a) "see how things are all connected and perhaps not separated into separate chapters, silos, compartments"; and (b) understand how "subtlety and nuance" exist "below the surface" when learning about U.S. History (PD1, 28:45-29:03; 35:42-36:19).

However, in order to derive additional meaning when revisiting data (e.g., when using one exchange of dialogue to inform the interpretation of others) and iteratively demonstrate a willingness to use insights from the perspectives shared by both the CFT Expert and Mr. R to "contribute to more conceptual and theoretical views" about the collaboration (p. 109), multiple cycles of such grounded analysis were required to balance appropriately building off CFT's theoretical framework with deriving meaning from what was recorded in the transcripts themselves. And indeed, over the course of analyzing the transcripts, it eventually became second nature to use noteworthy thematic patterns[6] from the "participants' own language…to detect (and share) processes, tensions, explanations, causes, consequences, and/or conclusions" (p. 200; citing Rubin & Rubin, 2012, p. 206). In this sense, grounding of the data analysis affected not only how findings' empirical significance came to be understood, but also how they were ultimately framed in a narrative sense for the aims of this study. Returning to the earlier example, the CFT Expert emphasized how "connectedness" and looking "below the surface" together embodied "a real meeting ground for researcher, learning theorist and teacher" (PD1, 35:56-36:19); and thus, pairing those "meeting grounds" emerged as a valid and grounded means of theming the data under one thematic category – namely, the collaborators' desire to build upon their shared sentiment of how history *should* be taught (i.e., Theme 1, as will be further laid out in "Results" below). It was hoped that by repeatedly taking such an approach to find meaning in the examined transcripts, whether it was "at the manifest level (directly observable in the information) or at the latent level (underlying the phenomenon)" (p. 199; citing Boyatzis, 1998, p. vii), such data analysis could effectively interweave "various themes into a coherent narrative" (p. 199), which could both inform this study and "advance effectively" (Williams & Moser, 2019, p. 47) future research centered on translating potentially relevant learning theories, including CFT/LICRA, into practice in K-12 classroom settings like Mr. R's.

Finally, to further flesh out the rationale of this study's approach to data analysis, there are a couple additional considerations that need to be acknowledged at this point. First, for any qualitative research like this study that is centered (at least in part) on "generating theory from collected data" rather

[6] An alteration to this line was made ("thematic statements" to "thematic patterns") following a conversation on March 13, 2022 with Prof. Dan Conn, a friend and colleague who works at Minot State University, that in part touched upon how a certain phrase (i.e., "patterns that emerge") might more accurately convey the variations in "language" that might be considered from the data. Prof. Conn gave verbal permission for said edit to be made.

than determining causality (p. 47), there is an assumption of "a constant interplay between the researcher and the data" that implies an ongoing and "reciprocal relationship" between "data collection, analysis and resultant theory generation" (p. 47; citing Charmaz, 2008, p. 47). With that in mind, building off this study's use of design research methodology and data analysis that is "incremental" in nature, space was given for some overlap between data analysis and later stages of the study (i.e., rather than conducting all data analysis after Stage 4), in order to allow for key insights gained by the collaborators during earlier planning discussions to organically inform their subsequent interactions. For example, analysis of key points raised about Mr. R's "reality" during PD1 (i.e., his feeling "constant pressure" due to being left "no room" in his curriculum beyond what was needed to "adhere to the standards"; 48:55-49:17) directly led to modifications in how subsequent meetings were planned, including the researchers deciding to only share one PowerPoint slide with CFT "catchphrases" instead of multiple CFT articles. In this sense, even as data analysis was theory-informed in part (e.g., using prior scholarship to formulate CFT catchphrases), grounding of data from the discussions themselves (e.g., making note of "meeting grounds" discovered during PD1) also played a role in shaping how the study unfolded. That said, even as adjustments to the study protocol were occasionally made, high priority was placed on maintaining a consistent alignment between the study design implemented and the primary question (and sub-questions) being addressed.

And second, theming of qualitative data has been noted as an approach that is "more applicable" when themes can be derived from "participant-generated documents and artifacts", as well as "an abundance of participant quotes and actions" from field notes and/or recordings (Saldaña, 2016, p. 200). With this in mind, while a definitive list of such materials could not be determined ahead of time (i.e., as explained earlier under 2.3.1), efforts were made across the study to triangulate data from PD1-PD6, outside correspondence between the teacher and researchers relevant for this study, and any "documents and artifacts" shared by the collaborating parties. This included materials shared by the researchers increase Mr. R's understanding of CFT/LICRA (e.g., CFT-focused PowerPoint slide, New Educator (2002) article), journaling undertaken by Mr. R (if any) that was thereafter shared with the researchers, and any resources Mr. R created pertaining to implementing or introducing CFT/LICRA within his classroom setting; and such materials will be cited as appropriate when reporting this study's findings. Collectively, by "consistently applying" such considerations alongside the aforementioned theory-informed and grounded approaches to data analysis across all stages, it was hoped that any insights gained from this study's findings would ultimately attain the empirical rigor necessary to validate its ability to inform future "generation of theory" related to better translating theories from academia into practice within K-12 classroom settings (including, but not necessarily limited to, CFT/LICRA) and/or conducting meaningful teacher-research collaborations for the purpose of producing impactful education research more broadly (Williams & Moser, 2019, p. 47; citing Glaser & Strauss, 1967, p. 43 for latter quote).

CHAPTER 3: RESULTS AND DISCUSSION

3.1: Overview

To offer a brief "road map" of sorts for how this study's findings are presented, high priority was placed on framing the qualitative data obtained with a logical progression from one section to the next, such that (a) each section of the "Results" section would roughly correspond with a different stage and address a distinct SQ, even as key interactions across PD1-PD6 were expected to connect with and build upon each other (and indeed did) within each section; and (b) the sections collectively would provide a clear and cohesive narrative about how the teacher and researchers' "mutual understandings" fueled the collaboration's evolution over the course of this study. With this in mind, the findings of this study were eventually outlined to inform each SQ through inclusion of a "prologue" (i.e., to capture the teacher and researchers' mindsets entering the collaboration) and four main "themes". More specifically, as shown in Table 2 below, each "theme" was intentionally situated to build upon two of the aforementioned "meeting grounds" explicitly identified as relevant by all three collaborators at the onset of the collaboration:

Sub-Question (SQ)	Main Stage of Study (and PDs) Used to Inform SQ	Theme (and # of Topics Under Theme) Used in "Results" to Inform SQ	Meeting Grounds (MG) for Theme
SQ1	Stage 1 (PD1, as well as PD2-PD6 as needed)	Prologue (1)/ Theme 1 (5)	**MG #1:** "Connectedness" in Mr. R's knowledge in relation to his pedagogy **MG #2:** Looking "below the surface" to differentiate between historical events
SQ2	Stage 2 (PD2-PD3, as well as PD1 and PD4-PD6 as needed)	Theme 2 (5)	**MG #7:** "Messiness" of "real world" in relation to proper learning of history **MG #8:** CFT's focus on "how the world operates…contrary to how" Mr. R is "asked to teach about the world"
SQ3	Stage 3 (PD4, as well as PD1-PD2 and PD3-PD6 as needed)	Theme 3 (6)	**MG #3:** Use of historical "examples" and resources to navigate "constraints" **MG #4:** "Constraints" within the teaching "reality" Mr. R must navigate
SQ4	Stage 4 (PD5-PD6, as well as PD1-PD4 as needed)	Theme 4 (7)	**MG #5:** Mr. R's use of psychological ideas for "interpersonal relationships" **MG #6:** "Strongly anti-Platonist, anti-essentialist" mindset toward students

Table 2. Layout of SQs, Stages of Study (and "Planning Discussions"), and "Themes" (and Corresponding Meeting Grounds) Used in "Results" Section to Inform Each SQ
[Note: Meeting grounds are abbreviated and slightly rephrased in table for clarity.]

It is worth noting several other considerations made when compiling this study's findings (November 27, 2022), including (a) seeking to present the data in a manner that might allow it to "flow as smoothly and organically from beginning to end as possible", even as such a mindset comes with the acknowledgment that not all noteworthy moments from PD1-PD6 could be included; (b) looking for moments where "particular details" from certain interactions could be connected to other key moments across the collaboration to more thoughtfully "flesh out the (topic) at hand"; and (c) using time stamps and direct quotes as needed to more directly ground the study's findings to the planning discussions themselves. In turn, in a manner to be more fully explained later, to make the layout of these findings "as brief and clear…as possible", parentheses were used to explicitly allude to "any specific concepts" or

notable “anecdotes shared” in the titles for each topic included (November 28, 2022), in a manner that will be replicated when presenting these findings to the collaborators during follow-up research.

Ultimately, for the sake of transparency regarding the purposes of this dissertation and how the data will be presented to the collaborators during future debriefing (i.e., as recaps within an interview protocol to be shared with the them during the future expansion of this study for publication purposes), what is shared in this “Results” section aligns to the highest degree possible, in terms of content and layout, with what will be presented to the collaborators, with one key exception for debriefing purposes that will be explained further under “Limitations & Future Research”. In addition, non-substantive edits will be made for the purpose of identification and clarity (e.g., sharing findings with the collaborators vs. sharing them in this manuscript) and/or correcting grammatical or phrasing errors should they be found.

3.2: Prologue: Entering Collaboration

3.2.1. Prologue, Topic 1: Initial mindsets entering collaboration (e.g., goals and expectations for different collaborators involved)

For the purpose of this study’s aims of examining how researchers and teachers might be able to communicate in collaborative ways that can foster mutual understandings and ultimately facilitate meaningful translation of theory into practice, at the start of the first planning discussion (i.e., PD1), the CFT Expert began by quickly making it a point to extol to Mr. R and the PI the importance of “studying one step back” across the discussions and avoiding the trap of “trying to do an intervention to study the (collaboration’s) effects on learning” (PD1, 9:41-10:47). Thus, he postulated that their first interactions should be centered on better understanding “the process of teacher and researchers talking together, working together” within the collaborative space shared by the three of them, in a manner that could then inform the development of future research, including within Mr. R’s classroom setting (PD1, 8:26-9:41).

In order to situate the gradual emergence of our shared community of practice in such a manner, it was critical to begin by gaining some understanding of the mindsets of both the teacher and researchers at the start of the planning discussions. On the one hand, it was important to get some sense of the theories of learning and knowledge that Mr. R was already being “guided by” in an “implicit or explicit” manner to direct his teaching practices (e.g., “‘What is teaching?’, ‘What is learning?’, ‘What is knowledge?’, all kinds of questions like that”), since doing so would make it possible to explore how his pedagogical approach might be affected “when the world changes (and) new purposes of learning come along” and why he might or might not be “sympathetic to some of the ideas” presented to him by the researchers (PD1, 8:26-10:19). For instance, even as Mr. R noted his belief that knowledge “includes facts”, he also emphasized the importance of learners having “an awareness of everything”, in a manner that entails being able to discern “the things that are also not facts” (PD1, 15:47-16:47). But beyond this, he recognized, as the “real key”, the need for himself to have the capacity to “unpack…and repack that

(information) for different audiences", in a manner that could involve delivering "the same ideas" very differently within different settings depending on what the situation calls for (PD1, 16:47-17:44).

On the other hand, hearing Mr. R present such preexisting teaching beliefs (and the resultant corresponding mindset he held for navigating his current learning environment) also enabled the CFT Expert and PI to reflect, including in an overt manner, on what their own goals and expectations from an academia-informed standpoint were when entering the collaboration. For instance, Mr. R made it a point to acknowledge how different concepts cannot "really be covered in any length" or with "any depth" within his classroom setting due to time-based curricular restrictions he was placed under and how he perceived it as increasingly difficult to teach his students today compared to those he was "teaching 20 years ago" (PD1, 18:35-20:58). In response, the CFT Expert recognized that when trying to help create meaningful learning conditions better suited for facilitating Mr. R's students' need to "step up from facts" to navigate a "contest of ideas that goes on in the world" for any given issue, it would be important as researchers for himself and the PI to maintain a mindset of appreciating the conditions Mr. R was working under (e.g., "limitations of time", the need to meet "certain standards", students' "entering knowledge" in terms of "quantity and quality") – even as the goal remained to explore where "a little more depth" might be introduced by Mr. R into his existing U.S. History instruction (PD1, 17:44-18:35; 20:58-22:05).

3.3: Theme 1: Reflections on How to Teach History as It Should Be Taught (Using CFT "Lenses" as Springboard)

3.3.1. Theme 1, Topic 1: Role of "connectedness" in teaching US History ("patriotism" vs. "protest", meaning of "conservative"; World Economic Forum)

When discussing how U.S. History should be taught in K-12 schools, particularly in relation to CFT principles, one of the most significant "meeting grounds" discovered early in the planning discussions was their agreement on the value of promoting "connectedness" in learners' knowledge, namely in terms of how Mr. R's "connecting up…something that happens here with something there" across topics covered in his curriculum could add a "little bit more depth" to his students' understanding of U.S. History (PD1, 20:58-22:05). More specifically, Mr. R described his prior efforts to "deliberately focus on racism" by trying to "pull (it) out" through use of "examples" that were "scattered throughout (his class's assigned) textbook" – even as he noted the additional "research" that was necessary to "marshal (his) resources out", including the effective use of "different media", at "the moment" such opportunities arose within his assigned curriculum (PD1, 22:05-23:05). Such an aspiration strongly aligned with his aforementioned sentiment that covering "concepts, ideas, paradigms", as opposed to navigating "mundane kind of classroom" matters or externally imposed "'standards' that have to be

covered (by him) within a certain timeframe", was "like candy" to him as an educator and thus something he cherished even as he acknowledged its rarity within his existing teaching context (PD1, 18:35-20:02).

In response, the CFT Expert suggested that Mr. R's effort to find such "connections across different topics *as they occur*" was praiseworthy as "a kind of learning gift" for his students, particularly due to it utilizing "a kind of adaptive, improvisational performance" that could demonstrate *by example* the importance of avoiding "black and white" thinking or the temptation to separate knowledge "into separate chapters, silos, compartments" when learning or thinking about different historical events (PD1, 27:56-29:03; PD3, 13:07-14:17). For instance, he later pointed out that Mr. R's willingness to examine historical concepts like "patriotism" and "protest" across "different perspectives" displayed across history (e.g., protesting "your government" during the Vietnam War) could facilitate his ability as an instructor to help his students put those concepts to "the *real. world. test.*" and eventually recognize their potential interconnectedness with each other (e.g., asking "when is protest patriotic and when is it anti-patriotic" and what such a distinction might "depend on") (PD6, 30:19-31:59). However, the CFT Expert also gave a word of caution by explicitly noting the importance of not being reductive in the opposite direction by settling for connections built upon "superficial similarity", such as assuming Reagan and Trump meant similar things when self-identifying as "conservative(s)…trying to make America great" rather than attending to the "very radical…differences" that exist between them despite their political "labels" (PD4, 40:47-41:56). And from the beginning when citing World Economic Forum, he made it a point to denote that such a balanced understanding of history, and "flexible response to new situations, new problems" in society as they arose, would be critical for not only Mr. R's students' ability to navigate daily life (e.g., "deal(ing) with the pandemic"), but also their ability to "get a job within a few years" (PD1, 41:12-41:57).

3.3.2. Theme 1, Topic 2: Helping students "look below the surface" (Harding/Trump; WWII/Afghanistan; "Hearts and Minds"/"Green Berets" for Vietnam)

Another mutual understanding discovered early in the planning discussions was centered on Mr. R's notion that true understanding involves a learner not only being able to "make those kinds of connections" between knowledge and their own life, but also "understanding enough to know where (they) can go to get more information about" whatever topic is being explored (PD1, 30:08-30:46). On the one hand, when asked about how such a definition might inform his efforts to help his students "find meaning" or "make sense of…historical situations, episodes, movements…that they encounter", Mr. R extolled the importance of helping them "see the repetitive nature of everything that happens", comedically referring to similarities between the "tons of scandals" faced by Warren Harding and Donald Trump during their terms as U.S. President as a noteworthy example of history repeating itself (PD1, 30:46-31:47). But on the other hand, when asked by the CFT Expert about the futility of trying to "predict the future based on the past" and what the "role of seeing differences where things might appear

kind of similar" might be, Mr. R also expressed readiness to leave the door open for opportunities to point out "*surprising* similarities and *surprising* differences" (as phrased by the CFT Expert; PD1, 33:35-33:48) between historical events as well. In particular, he shared an anecdote involving his class's exploration of why media depictions of America's involvement in different wars varies so significantly – namely, why one can find many "films…songs…(and) news stories" about the U.S.'s brief period of combat between D-Day and the end of World War II ("only about eight, nine, maybe 10 months of time, that's it"), but not so much about the U.S.'s "20 years" of war in Afghanistan during the early 21st century (PD1, 33:48-34:58). Possibly building off Mr. R's sentiment that "what isn't there…is just as important as what is", the CFT Expert was quick to praise his "spectacular" effort to encourage his students to "look below the surface" by using "subtlety of difference" to deepen their understanding of history (PD1, 33:48-36:20).

In turn, Mr. R's anecdotes about such "surprising differences" also reflected his keen awareness of the significant discrepancies that can often exist between what is often assumed about a particular historical event by the general public (i.e., due to how it is frequently recounted by mainstream media) and how it actually unfolded. For example, as recounted in a later discussion, after seeing his students struggle to form an "emotional connection" to the documentary "Hearts and Minds" (which he described as "the best film on Vietnam…that the Americans have made") and ruling out other alternative media (e.g., "Platoon" for being too long), Mr. R identified "Green Berets", starring John Wayne, as "a film that has characters and plot" that could offer a more engaging "story" for them (PD4, 15:32-17:33). But interestingly, he made it a point to use that specific movie *not* as a realistic depiction of how the Vietnam War truly unfolded, but rather, in a critical manner that framed the film as something for his class to "study in a way that's like, 'Why *isn't* this really like Vietnam?'" (PD4, 16:22-17:33). From there, he spent some time explaining how that unconventional approach impacted his students (PD4, 17:33-18:48):

> "But *then*, after I showed *that* film, (I) showed them how that is…has nothing: 'That is nothing. I know you appreciate this because of the story, but we're not learning anything about the Vietnam War. We're learning all the wrong things about the Vietnam War. We're learning what the conservatives wanted us to think about the Vietnam War. And *that's* where the value is. Now, let's go back and watch 'Hearts and Minds.'' It's like a whole different audience now, 'cause they have a deeper understanding of what the war *really* was versus what Hollywood wanted us to think it was."

On multiple occasions, the CFT Expert acknowledged how such pedagogy on Mr. R's part denoted a "real meeting ground" between "an important part of (Mr. R's) epistemology and…teaching philosophy" and the sort of "complexification for deepening" identified by "learning theorist(s)" as being

"crucial in CFT…pure CFT" (PD1, 34:58-36:20; PD4, 18:48-19:38). More specifically, he remarked that Mr. R's efforts to thoughtfully incorporate "subtlety and nuance", as opposed to acting as if "all wars are alike", strongly aligned with CFT's emphasis on avoiding the "routinized, scripted, generic knowledge schemas" promoted in "so much of cognitive and educational psychology" when teaching within domains of knowledge like history that are inherently complex and ill-structured in nature (PD1, 34:58-37:30). In this sense, the collaborators' shared desire to help students "look below the surface" offered an early glimpse of what CFT-informed U.S. History instruction might look like in Mr. R's classroom (e.g., use of a "beautiful, beautiful kind of epistemic example" to demonstrate why "a war is not a war is not a war is not a rose is not a rose is not a rose"), even as it highlighted major challenges (e.g., the risks that come with accepting a given media source's depiction of historical events at face value and thus overlooking the ulterior motives that might exist "below the surface" of their creation) that the collaboration would need to be prepared for in the pursuit of such curricular development (PD1, 34:58-39:09).

3.3.3. Theme 1, Topic 3: Managing higher cognitive load needed for learning with CFT mindset ("uphill climb" for Mr. R's current students; My Lai Massacre)

Even as the collaborators came to a mutual understanding regarding what true understanding might entail, they appeared to collectively acknowledge the high degree of difficulty that would likely be involved when trying to get Mr. R's students to buy into such an approach for learning U.S. History. In particular, when speculating on how Mr. R might end up "running this show" of teaching the subject in a CFT-aligned manner, he saw such an endeavor as "a real uphill climb" (PD2, 1:03:54-1:04:59; 1:10:25-1:11:09). This was due to the fact that around the time the planning discussions began (i.e., Winter 2022), Mr. R's students had recently dealt with extended time away from consistent in-person instruction due to COVID-19 and thus were ill-equipped when Mr. R began "asking them to…suddenly turn into students" (PD2, 1:10:25-1:11:09). Even as he recognized how much they endured while "doing remote learning on their own" and duly pointed out that "any teacher who's been there" faced similar challenges to his own, he did not hesitate to state that his students were "woefully unprepared socially to be with their peers, how to use a computer to study…just how to be people" (PD2, 1:10:25-1:11:09). And in large part because of this, the collaborators came to understand that it would likely take some creative pedagogical strategies to motivate Mr. R's students to get on board with the higher cognitive workload that'd be inherently involved with learning U.S. History with the sort of mindset advocated for by CFT – particularly when developing the cognitive readiness needed to "be on guard for the new, in addition to repeating patterns" across different historical events covered in Mr. R's curriculum (PD5, 38:41-40:18).

On the one hand, emphasis was placed on noting what Mr. R was *already doing* to help his students think in a more CFT-like manner about what was presented as part of their existing curriculum. For instance, when recounting his efforts to help his students try to "think about the different perspectives

involved" in the My Lai Massacre, Mr. R noted how his lesson was designed to take time to discuss not only "what was going on in the minds of those involved" (i.e., the "officers…villagers… (and) photographers" who were present), but also why it might have been "easy…to get the Americans to just do things that they normally wouldn't ever do" from a moral standpoint (PD6, 38:18-40:35). On the other hand, space was also given to brainstorm how the collaboration could be *built upon in the future*, including integration of CFT into Mr. R's instruction, in order to deepen Mr. R's students' thinking about U.S. History. In particular, the collaborators spent an extended period of time reflecting on what might help encourage Mr. R's students to apply a "cognitive ethos" for "going deeper, seeing twists and turns" while navigating the Web, rather than falling into old habits of using the Web as a means for "looking for the answer, closing down" in *avoidance* of higher cognitive load. (PD4, 45:52-47:05). For example, in a during a series of interactions that will be covered more fully later, the CFT Expert explained to Mr. R how a complex notion like being "reciprocally adaptive" during LICRA Web searches (i.e., changing one's search strategies in a cyclical manner in direct response to what one discovers online) might be explained to Mr. R's students during one of his lessons in a less intimidating manner (PD4, 47:57-49:09):

> "But then, for 'reciprocally adaptive', you just sort of say what that means:
>
> 'Hey, what your ideas now are are going to change, 'cause you're gonna learn something from the Web. So *feel free to use what you are finding on the Web in your searches* to change direction for what you're looking for. It's back and forth. You're *working* with the Web, it's like a collaboration with a friend. It's showing you where to go next, in part. You kind of have some sense of where you wanna go? Now the Web is showing you some other possibilities. Be open to that too. Be open to learning from the Web about where you might wanna go next that you hadn't thought of. That's what we mean by 'reciprocally adaptive'.'"

3.3.4. Theme 1, Topic 4: Mr. R's process of learning/applying CFT "lenses" using catchphrases ("the case is the reference"; "concrete thinkers"; "novelty")

In line with concerns raised related to cognitive load, another challenge identified for translating theories discussed during the collaboration (e.g., CFT/LICRA) into practice was the need to consider how their underlying principles might be repackaged in a manner more suitable for deliver within Mr. R's teaching context. In particular, as previously alluded to, in order to center the collaboration around the constraints of Mr. R's "reality" as a teacher (e.g., students' fairly recent return to in-person instruction; limited time available for deeper learning due to needing to "get the students ready for their standardized tests"; PD1, 45:46-46:43), the question was raised early in the collaboration about how the "general

cognitive values" (PD2, 1:20:01-1:21:29) of CFT might be made more digestible and applicable given what Mr. R was reporting about his classroom setting at the time. Eventually, one strategy identified was to share "catchphrases" with Mr. R that were meant to serve as "helpful little reminders" or "shorthand" for meaningful facets or "lenses" of CFT (PD3, 4:37-6:12), in order to make them easier for him to remember or refer to while trying to help his students think "a little bit richer, a little fuller" (PD2, 17:50-18:51). And ultimately, the researchers hoped that introducing such catchphrases could contribute to the formation of a "marriage" between Mr. R's "way of teaching (his) values, (his) class" and "certain CFT ways of thinking" that appeared to be "compatible" with his instruction (PD3, 4:37-6:12). To recap what was discussed about their development earlier, the CFT catchphrases shared (predominately during PD2, with a couple more added during later planning discussions) included the following eight mantras:

- It's not that simple!
- It depends!
- Be open to understanding concepts, and be flexible in applying them!
- Be ready for the unpredictable and new, the non-routine, the unique!
- What does the situation call for?
- Cases come first!
- Think multiple instead of single!
- Don't think in black and white!

However, towards the end of the planning discussions, Mr. R pointed out that the catchphrases, from his perspective, felt "a little more difficult to integrate into what my own jargon is that I use in the classroom" (PD5, 14:38-15:22). Thus, he began to implement his own "translation of theory into practice", as the CFT Expert put it, by sharing his own "translations" of certain catchphrases that felt more authentic for him to say within his classroom setting (PD5, 32:38-34:01). For example, when discussing a historical event, instead of saying "cases come first", Mr. R suggested that he might tell his students, "No, there's no branching off from what this one thing is. The case is the reference." (PD5; 15:36-16:10). On the one hand, such efforts by the teacher to put facets of CFT shared by the researchers "into (his) own world, into (his) own words" were warmly praised by the CFT Expert for offering a "very, very nice" exemplar of "putting 'ivory tower', in the clouds, academic ideas into practice" (PD5, 32:28-34:01) – namely, by reframing cognitive flexibility with the sort of "non-technical" and "jargon-free" language endorsed by prior CFT scholarship (Spiro, et al., 2019, p. 963). That said, it also highlighted the need to thoughtfully set time aside for "*clarifying* the use of terms" that might be understood differently by the collaborators involved (PD5, 48:06-48:57), including their different perceptions of whether

students being "concrete thinkers" is a good thing (PD1, 1:02:06-1:02:19) and whether they defined "novelty" more as a "hook" for engagement or as a "cognitive mindset for meaning" (PD5, 35:24-37:26).

3.3.5. Theme 1, Topic 5: Relationship b/w CFT "lenses" and Mr. R's understanding/practice of teaching (Mr. R's "translations"; "foot in same stream twice")

In any event, when thinking about how U.S. History should be taught and how CFT could play a role in making that possible within Mr. R's classroom setting, he ultimately envisioned his use of CFT "lenses" (e.g., through referring to the catchphrases) as a "'tool in the toolbox' kind of thing", in terms of having it as a resource on hand whenever he was "trying to engage the students into some sort of deeper thinking…about the different perspectives involved" when learning about important historical events (PD6, 38:18-40:35). It is worth noting two key tenets that such a mentality appeared to be built upon.

First, Mr. R expressed a strong desire to ascertain how he could adequately "frame" CFT to align with "the things I say in the classroom", or at least critically evaluate them in the sense of being more realistic about "how I might say them (when) integrating them in the class" more explicitly (PD5, 15:23-15:35). With that in mind, as a result of becoming more comfortable over time with brainstorming his own "translations" of the CFT catchphrases shared with him, Mr. R ended up reporting to the researchers that he'd taken the initiative to create a more structured document titled "Not that Simple"[7]. It consisted of a list of his "interpretations of CFT Cognitive Value Catch phrases that I use, have used or are nuanced interpretations of what I recollect having used", although it is worth noting that the document was created *before* the eighth CFT catchphrase (i.e., "Don't Think in Black and White!") was conceived within the collaborative space and added to the list. For example, when thinking about the catchphrase "It's not that simple.", Mr. R came up with the following "translations" (see Appendix Q for Mr. R's full document):

- It's more convoluted than you would think
- What about other perspectives or concerns?
- Is there a different way of looking at this?
- Could we use a different lens to view this in another way?
- Could there be underlying motivations and if so, what might they be?
- Put yourself in that day and time. How are things the same? How are they different?

And over time, Mr. R's efforts to critically evaluate or "frame" CFT even began to showcase how the researchers themselves could better explain CFT outside academia. For example, when discussing

[7] The title of the document file in its full form is "Not That Simple…pick me!", while the title in the document itself is written as "Not That Simple [insert light bulb here]", so it is generally referred to as "Not That Simple" for clarity.

what might go into "teaching teachers to teach" using CFT as a theoretical framework, the CFT Expert argued that a teacher's "case book" should not be separated into siloed sections like "a chapter on classroom (management), (or) all these concept-based chapters"; rather, it should confront the inherent complexity of teaching in "real world, messy cases" by acknowledging the need to utilize classroom management strategies that suit whatever teaching situation might be at hand (PD2, 49:43-50:05). In line with this, when expressing support for the notion that "every case (when teaching) is an individual case, because the variables of every case are", Mr. R suggested citing Heraclitus by saying "you can't put your foot in the same stream twice" – thereby demonstrating how the principle of embracing the uniqueness of "every case" might be translated for the unique "case" of teaching K-12 students (PD2, 49:27-49:43).

And second, even as such efforts were regarded by the CFT Expert as a "perfect" and "crucial" consideration when thinking about how CFT/LICRA itself could be discussed within K-12 settings (PD5, 14:38-15:30), exposure to the CFT "tools" also appeared to eventually impact Mr. R's thinking about what might be possible for himself as a teacher moving forward on a broader scale. For example, he recounted a recent incident when he showed his students a documentary that focused at one point on "veterans being fitted for prosthetics" at the Veteran's Hospital in Philadelphia, noticing that what was moving for him was "not as moving for the students" (PD4, 25:07-26:20). In response, he made note of the country song playing in the background of the scene (i.e., "The Star-Spangled Banner's Waving Somewhere" by Elton Britt) and proceeded to play the song in class during "the last two hours of the day…as the students walked in and outta class" (PD4, 26:43-27:00) after finding it on YouTube. In turn, after the scene identified one individual "being fitted for a prosthetic", building off what Mr. R learned about LICRA earlier in the collaboration, he "Googled his name" and discovered that "sure enough, the guy is alive and has been doing all kinds of work with veterans…and all sorts of stuff on the East Coast" – thereby demonstrating by example what it looks like to, as the CFT Expert put it, use the Web "as an *extension* of the mind, rather than a *substitute* for thinking" (PD4, 25:07-27:32). Put another way, by demonstrating "*on the fly*, during teaching" how Google might be used alongside his "prior knowledge" to "*enrich* what's being learned" during his lessons, rather than "narrow(ing) it" through mere fact-finding, Mr. R himself – through navigation of his own teaching context – came to exemplify *by praxis* how K-12 educators might meaningfully translate CFT into their teaching practices (PD4, 26:20-26:43).

3.4: Theme 2: How History "Should" Be Taught vs. How History Is "Traditionally" Taught in Schools

3.4.1. Theme 2, Topic 1: How the ways Mr. R is asked to teach US History are "contrary" to "how the world is" (Wittgenstein; "intermediate cases")

Even as considerable time was spent discussing what U.S. History instruction *should* entail, from early on, the collaborators mutually acknowledged the difference between what would be ideal for teachers in K-12 settings and how teachers are "traditionally" (i.e., under typical circumstances in today's educational climate) encouraged or told to teach U.S. History. For example, in a manner that explicitly alluded to the National Commission of Excellence in Education during the Reagan administration, Mr. R noted the "pressure" teachers are under to "show that our students are learning…on some standardized thing", namely through demonstrating "growth…over a two-week period…based on how much they grow from that one pre(test) to the post(test)" (PD1, 1:12:25-1:13:46). Based on his personal experiences as a teacher, he was emphatic in declaring that he "hate(d) everything about it", including how it often encourages "just teach(ing) 'em the questions on the test" rather than promoting their true understanding of a given subject – a concern the CFT Expert seemed to "agree completely" with, suggesting that it was likely contributing to "an epidemic of disengaged students who don't care" (PD1, 1:12:25-1:14:52). Even further, when asked to give his "preliminary" sense of why he "expressed a certain sympathy with the CFT approach as fitting" with his approach to teaching, Mr. R postulated that what CFT promotes as a learning theory appeared to him to be in line with "how the world operates" and "how the world is" – which, in his mind, conflicted with "how you're asked to teach about the world" (PD1, 1:17:55-1:18:45).

In direct response to this exchange, the CFT Expert excitedly noted Mr. R's sentiment as "a perfect characterization of CFT and its goals", pointing out that the need to navigate "messy 'real-world', complex 'real-world', novel occurrences in the 'real world'" was a significant motivator behind CFT scholarship's critiques of "so much of ed psych research on learning, and so much teaching" (PD1, 1:18:45-1:19:43). That said, even as such dialogue denoted how CFT could complement Mr. R's sense of how U.S. History *should* be taught, it was also important to make note of when the planning discussions highlighted aspects of Mr. R's "reality" that were hindering his teaching goals in an ongoing and noteworthy manner. For example, later in the collaboration, Mr. R explained how individuals (be they fictional or real) like Les Misérables' Jean Valjean stealing bread for his family highlighted the reason why he is strongly motivated by his belief that "there are always shades of gray (and) there is no black and white ever" when trying to understand people and teach his students about them (PD6, 46:19-47:01). But his extolling such a belief appeared to shed some light on frustrations he had previously expressed – namely, how increased pressure to "get standardized" and maintain a "certain pace" had led to his

school's administration going in "the opposite direction" that they should be going (i.e., in contrast to how they conducted things during his "first ten years" teaching there), including removing particular assignments designed to promote deeper thinking (e.g., a "portfolio assessment" capstone for seniors) and imposing restrictions that left him "no room" to help his students "think about things differently" or reflect on "how life is for these people" involved in major historical events (PD1, 46:43-49:50).

In line with those espoused grievances, the CFT Expert explicitly acknowledged that education policymakers involved in creating standards for teaching K-12 students "tend very often, in thinking about and teaching history, to pick clear cases" and avoid inclusion of more complex historical examples "partly because they *are* gray area"; and in his mind, schools should begin heeding Wittgenstein's call to "look at the intermediate cases, the ones that aren't so clear cut, 'cause that's how the world is" (PD6, 47:24-48:11). Thus, the researchers seemed to strongly empathize and agree with Mr. R's lament about being asked to teach (e.g., using "historical examples" that avoid "gray area(s)") in ways diametrically opposed to how the collaborators felt students *should* be learning U.S. History (PD6, 47:24-48:11).

3.4.2. Theme 2, Topic 2: Role of "conspiracy of convenience" in learning mindset being promoted to K-12 students (siloed nature of teacher casebooks)

In addition, the collaboration also took time to speculate on *why* teachers like Mr. R were being encouraged or told to teach U.S. History using an "existing approach" that "doesn't work" in preparing students for the "real world"; and to start navigating this question, the CFT Expert recalled an "in-politic moment early in (his) career" when he referred "in print" to a phenomenon that he described as "the conspiracy of convenience in education" (PD2, 47:26-47:44). Explaining further, he suggested that the existing way of teaching U.S. History might be in place due to its ability to make things "easier for the textbook writers to write, easier for the test makers, (and) easier for the students who wanna know what's on the test and not have to think about anything", even if that means the U.S. History standards being taught under such a system fail to "fit the *world*" that students are supposed to be learning about (PD2, 47:46-48:50). Beyond this, he also was quick to point out that even if leaders in K-12 education are given the benefit of the doubt by assuming that their artificial process of "creating a simple reality" is derived from good intentions (e.g., making history more "manageable" to learn, ensuring that all parties involved are "all on the same page"), such misguided actions could go a long way in explaining "why kids can't apply their learning from history to the news they see at night" (PD2, 52:17-52:34). Thus, one dimension of confronting this "conspiracy" that drew the researchers' attention over the course of the collaboration was examining what could be done within educational settings like Mr. R's to discourage such an inappropriate overreliance on "routinized, scripted, generic knowledge schemas" that assume any given domain of knowledge can be applied in the same manner across all contexts (PD1, 36:20-37:30). In other words, they held a desire to discuss what might be done to better prepare Mr. R's students to apply their

historical knowledge to better navigate "a situation, a problem, whatever, something that's novel", such that they might eventually be better equipped to navigate "a messy world they have to live in, not just their jobs, where 'keeping it simple' is not going to work" (PD1, 37:30-39:09; PD2, 50:54-52:10).

Thus, in order to collaborate with Mr. R to identify how CFT research might be put into practice via his U.S. History instruction in a meaningful way, the researchers quickly came to recognize the need to first put in the effort to more fully understand the conditions that the teacher was already operating under within his authentic classroom context. For example, as Mr. R began to open up more about his teaching experiences, he took such an opportunity to bemoan how expectations placed on teachers like him to work around "standardized tests in order to show that (students) have demonstrated growth" often left no time to "do anything that would make them independent, critical thinkers" (PD1, 41:57-42:52). In response, the CFT Expert eventually tossed considerable criticism at how teacher casebooks fall into such a trap of "convenience" as well, namely by having their guidelines for different aspects of teaching (e.g., "classroom management", effective lesson planning) "nested in a single chapter" and in an "orderly manner" that "goes out the window" as soon as "real world, messy cases" occur within a given classroom (PD2, 47:46-48:50, 49:43-50:05). Such a complaint was immediately seconded by Mr. R, who pointed out various considerations that he needed to deal with as a teacher on a regular basis. In particular, he listed off a series of possible events – "throw in the fact that four of the kids' parents argued to the point of almost beating each other up that morning, seven haven't had breakfast, one got beat up on the bus" – that appeared to make it even more justifiable to argue that "the real world part" of teaching was "never a part of any of the case studies" included in the casebooks provided to those training for the profession, at least not to the degree that it should be (PD2, 48:50-49:07). Thus, the collaborators began to place high priority on exploring not only how Mr. R might use CFT to "at least entertain the idea" to students that "21st century skills, and…how to think creatively in response to situations that you don't already have knowledge memorized about" are "crucial skill(s)" to learn, but also how the researchers could help Mr. R navigate the pitfalls and obstacles *already undermining his efforts* to instill a learning mindset in his students better suited for understanding U.S. History and navigating the "real world" (PD1, 43:16-45:46).

3.4.3. Theme 2, Topic 3: Potential pedagogical considerations for helping students change "the way they think" (e.g., to appreciate history's "messiness")

When brainstorming how to instill a learning mindset better suited for navigating the "real world" (e.g., being able to apply relevant knowledge from different historical events to a given situation as it unfolds), a topic repeatedly discussed by the collaborators was which CFT-informed pedagogical strategies might be utilized to help Mr. R's students "change the way they think", regardless of whether or not they "realize they have epistemic beliefs" already ingrained when they enter his classroom setting (PD6, 15:13-16:26). Even as they recognized that it would likely be "hard to change any habits (of

mind)" displayed by Mr. R's students in a wholesale or extensive manner, a certain degree of optimism nonetheless persisted when broaching the topic – namely, around the idea that if the right sort of classroom "exercise" could be identified, it might be possible to "get a wedge in" and encourage them to think about historical concepts in a slightly more "open" way (e.g., how they can be "used differently" in different contexts), rather than merely "looking for the right answer for the test" they might have to take (PD6, 15:13-16:26). And as the collaborators weighed what such an endeavor might entail, one of the more promising insights made was the degree to which they were aligned in their viewpoints on how to portray U.S. History as a domain of knowledge to Mr. R's students. In particular, one of the meeting grounds identified as "a real place where our epistemologies intersect" was when Mr. R declared that something he had "learned about history over time is history is a fucking mess" – a sentiment the CFT Expert enthusiastically endorsed, noting that among other academics, "CFT is sometimes called, if I don't wanna say 'ill-structured' domains, I say 'messy, real world' domains" (PD1, 1:01:38-1:02:06).

That being said, the unique perspectives held by the teacher and researchers sometimes fostered noteworthy differences of opinion when they discussed potential considerations that should be made when trying to motivate students to learn for more than simply passing a test. For example, returning to one of the examples previously alluded to (i.e., under Theme 1, Topic 4), Mr. R expressed his concerns that his "audience" of "14-year-olds and 13-year-olds" tends to be "very concrete thinkers" (PD1, 1:02:06-1:02:19). More specifically, he postulated that because "everything is black and white for them", such a mindset might make it "really hard" for them to respond positively to CFT or any instruction that might be informed by the learning theory (PD1, 1:02:06-1:02:19). In contrast with that more pessimistic outlook, however, the CFT Expert replied by interjecting that "concrete is good, though", eventually elaborating on that point further in several distinct ways (PD1, 1:02:06-1:02:19). First, he argued that if Mr. R's students were "concrete" thinkers, that meant they would be "starting in the right place" in the sense that they would be "*ready to understand* that the world is messy, that history is messy" (PD1, 1:02:19-1:03:34). Put another way, rather than seeing concrete thinking as a hindrance to learning in the manner that CFT calls for, he observed from a theoretical standpoint that students' ability to "look at the concrete situation" simply meant that they were thinking in ways aligned with how humanity has used "adaptability" to "evolve and survive" over "hundreds of thousands of years" (e.g., killing bears to "wear their hides" in freezing weather) – thus implying that concrete thinking is part of what makes us human (PD1, 1:02:19-1:04:26). In turn, the CFT Expert put forth the notion that while students "come into school" already cognizant of the world being "messy", schools as they currently operate "knock it out of them by giving 'em all the multiple-choice tests" – thereby implying that criticism should be levied on schools' ill-preparedness to support concrete thinking, rather than on students when they tend to think in such a way (PD1, 1:03:34-1:04:26). Finally, the CFT Expert was overt in framing CFT as "a return to

concreteness, which is where (Mr. R's students) already are"; but beyond this, in response to Mr. R expressing uncertainty about how to find ways to get CFT "sprinkled in" his curriculum, he regarded the teacher's existing pedagogical strategies (e.g., trying to "show how Afghanistan isn't just…'another war'") as an indicator that he was "already partly doing" what both CFT and a focus on "concreteness" call for (PD1, 1:02:06-1:04:26). In this way, the discussion on "concrete thinking" evolved into not only a rebuke of how U.S. schools systemically operate, but also praise for Mr. R's attempts to navigate them.

3.4.4. Theme 2, Topic 4: Potential pedagogical considerations for helping students use the Web ("freedom" exercise; textbook as hypertext via "index")

In addition to exploring how to help Mr. R's students change "the way they think", the collaborators also spent time discussing what could be done to better monitor and support their learning following exposure to historical events both past (e.g., through topics covered in Mr. R's curriculum) and present (e.g., through what is being reported on the news), particularly during their navigation of the Web. In particular, the CFT Expert emphasized that for key historical concepts like "freedom" (which was used as an example due to Mr. R's textbook being titled "Call to Freedom"), there is merit in encouraging students to engage in a CFT-informed mindset by having them "open things up" during their online exploration, rather than settling for a more "closed" approach intended to "spare yourself the trouble of thinking" (PD2, 1:28:37-1:29:37). In particular, he alluded to two principles of LICRA Web searching that promote such "openness" – namely, that (a) oftentimes "there *isn't* a single right answer (or) a single thing to find" online when learning about a topic due to its inherent complexity or multifacetedness; and (b) on a technical level, modification of search terms might be needed when "what you find with your first search" does not provide the level of understanding you are hoping to gain (PD2, 1:28:37-1:31:19). In doing so, he postulated that that Mr. R's promotion of a more "open" use of the Web could play a major role in helping his students extend their understanding of U.S. History "beyond the definition(s)" in their textbook, such that they might begin to more easily "see different ways" that concepts like "the idea of freedom" can be used (PD3, 55:20-56:25). In response, keeping his class's limited time towards the end of the school year in mind, Mr. R wrote a prompt and shared it with his students (PD5, 18:04-18:38):

> "The title of the textbook this year was "Call to Freedom". To the best of your ability, explain the meaning behind the phrase "call to freedom". What does it mean? And explain why did the publishers choose the title they did. You may use any resources that you have available to help you answer this prompt, including the Internet."

For this "ungraded" activity, Mr. R reported receiving about 40 responses from students who "just did it because they did it" (PD5, 19:21-20:14). And while anecdotes about what students wrote

about during this learning exercise will be covered in greater detail later (i.e., under Theme 4**),** it is worth briefly noting here that even as Mr. R discussed how his students fared on the assignment, he was also quick to raise concerns about what could be done to ensure that *his own translation of LICRA into practice* was actually helping promote such an "open" use of the Web. For example, he was caught off guard by *how* some of his students chose to tackle the prompt, particularly those who appeared to utilize a "novel" strategy when they would "pick up the textbook…and try to figure out" what the phrase meant by completing a "big, huge scan" of the "index" as a point of reference (PD5, 19:21-20:14). Even as the CFT Expert praised the approach as a "really cool" strategy for "turn(ing) the text into a hypertext by just going different places using 'freedom' from the index", such decision making also appeared to foster slight changes in Mr. R's pedagogical thinking – namely, his recognition of the need to be clearer to his students regarding what is appropriate or expected when completing learning activities involving CFT, particularly if "the Internet" is where he wanted them to "try to spend their time" (PD5, 18:04-20:48).

In response to this self-reflection, the CFT Expert suggested that doing so could simply entail adding more straightforward instructions, offering the following as a suggestion (PD5, 18:38-19:21):

> "Just say, 'Next stage, get on the Internet. Start by Googling 'freedom', but then add terms to it. So you have freedom, and put different historical contexts after freedom and then see how freedom is used differently in different contexts…Start with 'freedom', but then add terms. 'freedom Civil War', freedom World War II'…And, you know, suggest one or two additional prompts and then ask them to also say which additional prompts…*they* add(ed) to 'freedom'."

And eventually, the CFT Expert went further by beginning to brainstorm about what sort of LICRA-informed online exercise (and corresponding instructions) could emerge as "one CFT lesson" to implement that could offer Mr. R's students "something new…something (that he hadn't) done with them before" (PD5, 22:10-23:22). In particular, he envisioned that Mr. R might be able build upon the "diverse ways" "freedom" was being used in his textbook, suggesting a four-part activity incorporating the Web that he could try if he wanted an exercise that was "kind of CFT-ish" (PD5, 20:40-23:22; 24:03-27:28):

1. Have students "think about two or three places in the course where freedom…is a prominent sort of idea", and then "use the Web, use Google" to conduct searches (e.g., "freedom plus 'Case X', freedom plus 'Case Y', freedom plus 'Case Z', whatever") to explore how each "case" or historical event applies the concept of "freedom" (e.g., "Jim Crow freedom").
2. Ask them to complete a similar second step, but instead of doing a search for "freedom and events" (i.e., using a "case or example"), have them conduct a Web search using "freedom

plus a constraining descriptor" or "adjectival modifier" (e.g., "economic freedom, political freedom"), in order to understand how the concept is used in those contexts.

3. Explicitly encourage students to use what they have discovered on the Web to reflect on how "freedom" might "mean the same thing in those contexts" and how it might "mean something different", and then follow up on that reflection by constructing a corresponding "test question" to "ask them later" (i.e., "How was it similar and how was it different?").
4. And finally, following the completion of Steps 1-3, proceed to ask the students the following question: "Did your eyes get opened in some way by seeing how freedom, at the same time that they can mean different things in different contexts, could still be freedom?"

But even as Mr. R made it a point to show that he had taken written notes to remember the learning activity for the future, he noted that it would likely not be able to take place on "the last few days of the semester" due to all the "preparation" that would likely be required (PD5, 27:28-28:00). Thus, even as intriguing pedagogical strategies were identified that are potentially worth researching further (e.g., monitoring Mr. R's students' responses to a CFT/LICRA learning activity that asks them to "turn the (print-based) text into a hypertext"), the teacher's observations and acknowledgement of the planning required also highlighted the need to be precise and methodical when considering what it would take to implement such classroom instruction (PD5, 20:28-20:40). But as a silver lining, while Mr. R expressed disappointment at not having time to integrate such insights into a "lesson plan" for the students he was teaching at the time of the planning discussions, the CFT Expert was quick to remark that "life is a research program" and that future opportunities would present themselves (PD2, 27:46-29:08).

3.4.5. Theme 2, Topic 5: How to explore history's complexity or "messiness" in current "political climate" using CFT as a "cover" (Truman desegregation)

But even as such considerations were being explored for the purpose of navigating the current state of K-12 education, one of the most persistent concerns explicitly acknowledged by the collaborators was how factors *beyond one's classroom setting* could also strongly shape how teachers like Mr. R are being encouraged or directed to teach U.S. History. More specifically, the researchers came to appreciate that the process of trying to help Mr. R's students appreciate history's "messiness" could be hindered not only by his school's ongoing push to get students "ready for their tests, for their standards" put in place by policymakers, but also by the "controversial political climate that we are in" and the resultant "finessing" needed to integrate the efforts of the collaboration into his teaching context (PD3, 13:19-15:20). For example, one historical topic Mr. R mentioned wanting to discuss with his students was Truman's desegregation of the military and how the "tipping" point for that policy's enactment was his learning about a soldier (i.e., Sgt. Isaac Woodard) who was pulled off a bus, beaten with batons and

ultimately blinded "while he was in uniform" (PD3, 22:03-22:51). In particular, he had a desire to "CFT" that historical moment by exposing them to "a whole bunch of documents" from the Truman Museum in Missouri reflecting the "multiple voices" who consulted with him (PD4, 11:18-12:59). In response to the CFT Expert's question of whether they were "contradictory", Mr. R elaborated (PD4, 12:59-14:04):

> "There was a couple from some of his close friends which used the 'n-word', telling him, 'Hey, you know how to make the right decision.', and, 'You're a good old Southern boy, and you know what you're supposed to do'. And Truman writing back, with his voice saying, 'Hey, we can't let this go on…when I'm the President, I have to make decisions that affect the entire country.'"

To Mr. R, the variety of perspectives surrounding this historical event were critical to highlight for his students – particularly in light of an incident that occurred at his school at the time the planning discussions were unfolding, when "someone said the 'n-word', and then a cafeteria worker jumped over the barrier between the students and the cafeteria workers and started fighting with one of the students in the cafeteria during lunch" (PD4, 13:06-14:04). Even as he was quick to note out the precautions he took during his lessons on that topic (e.g., "making sure that the students noticed that yes, the 'n-word' is there in the text, but we don't have to say it"), the researchers expressed concern that the collaboration, and Mr. R in particular, might end up in "hot water" if such sensitive topics were not broached carefully (PD4, 14:04-14:39; PD1, 24:08-25:00). More specifically, the CFT Expert was very vocal in declaring that "the fucking right is ready to pounce" and proceeded to present the following scenario (PD3, 27:00-27:58):

> "You do too much with ''Whites are bad' is one of the lessons of history. Go home, tell your parents.', 'I learned this way that whites are bad. I learned this way that capitalism is bad. I learned that–'…all of a sudden, you're anti-white and a communist, and that might not play well with parents. And parents are going to school board meetings, taking over, they're getting teachers fired. This is not a good time to have something that can be twisted into anti-white, anti-capitalist. I would stay a little less controversial just to protect yourself at this moment where they are just *looking* for some teacher to do this, to make an example of."

Mr. R immediately responded to such a potential chain of events by plainly stating that "if I have to be that person that sticks up for folks and teaches the truth, then so be that; and I can retire and have 30 years retirement, and I'm okay" (PD3, 27:58-28:11). Nevertheless, even as the researchers were ready to support Mr. R however he might choose to implement CFT in his classroom setting, the CFT Expert was quick to reiterate how CFT can serve as a tool for him to "have your cake and eat it, to tell the truth and

have your job too" (PD3, 29:49-31:05). In other words, he repeatedly extolled "using complexity as a cover for 'somebody's right, somebody's wrong'" – namely, by centering class discussions for any given historical topic around learning more about the "multiple perspectives" that are involved, as opposed to taking an overtly normative stance by explicitly "saying anybody's right, anybody's wrong" (PD3, 14:17-15:20). That being said, it must be clearly stated that such a strategy appeared to be promoted with the intention of identifying ways for Mr. R to deepen his students' knowledge of how history is "relevant" and "isn't just the past" in a manner feasible within his classroom setting (PD3, 25:02-25:58). Thus, it should not be misconstrued as the collaborators endorsing any sort of overlooking or minimization of how injustices and systemic inequities have shaped and continue to shape American history, as reflected by their acknowledgment of the 2021 incident involving Lieutenant Caron Nazario (PD3, 31:06-31:38).

3.5: Theme 3: Navigation of U.S. History Instruction Within "Constraints" of Mr. R's Teaching "Reality"

3.5.1. Theme 3, Topic 1: "Constraints" of Mr. R's "reality" on his efforts to help students navigate "messy world" ("wedge points"; "jargon"; "museum")

In light of the factors impeding Mr. R's ability to teach U.S. History to his high school students as desired on an ongoing basis, it quickly became a high priority for the collaboration to explore what could be done to help his students "somehow think about things differently" and better navigate the "messy world they have to live in" – but in a manner that duly accounted for what Mr. R could feasibly do "*given the constraints*" that he was "operating under" within his "reality" as a teacher (PD1, 45:46-51:15; PD2, 50:54-52:10). In fact, the CFT Expert was explicit in pointing out that the "dilemma" involved with navigating such constraints "gets at the heart of this collaboration", further justifying the decision to explore that issue across the planning discussions from several different angles (PD2, 33:27-35:11).

First, Mr. R noted that what the CFT catchphrases promote often clashes with what is "built into the system" he works within. In particular, as a "person who has to *score* ninth graders' *papers*", he had to keep things "pretty simple" with grading (i.e., as opposed to adhering to the catchphrase "it's not that simple"), mainly due to that approach being "drilled" into his students through standardized testing and how schools often assess academic performance (PD2, 32:30-33:12). But even as it was accepted as "a fixed, a given" that Mr. R's students would need to "learn something simple" to make it both "easy for (Mr. R) to grade (and) not distracting for them", the CFT Expert suggested that "within 'keeping it simple'", the collaborators should seek to identify where "little wedge point(s)" might be added to help them "learn a little bit" in ways that will help them think more deeply and "prepare them so they'll be able to get jobs eventually" (PD2, 33:27-35:11). Second, the researchers understood that even as they shared what prior CFT research suggests for promoting deeper learning (e.g., "how opposite (LICRA) is" from

students' typical approach to online learning), Mr. R would likely not gravitate to teaching his students "the way (the PI) taught doctoral students in his practicum" (PD4, 54:11-55:16). Therefore, they placed strong emphasis on the role of "translation, communication, and so on" across the collaboration by chronicling how Mr. R, as "the expert teacher", deemed it appropriate to "filter through (his) experience,…knowledge of the kids,…(and) knowledge about teaching these topics" to introduce a new "way of thinking" to his students that goes beyond the "academic bullshit world of jargon" (PD4, 55:16-57:28). Put another way, Mr. R was very plainly and categorically told that for the purposes of this collaboration, "you're on stage…you're in your milieu, not *our* milieu" (PD4, 56:12-57:28).

And finally, beyond considering the state of existing assessments and Mr. R's framing of CFT as a learning theory, there was a need to brainstorm *where* different facets of CFT might fit most seamlessly *into his lesson planning*, whether that involved discussing learning activities he had previously introduced to his students or weighing the merits of ones that he hoped to eventually share with them. For example, Mr. R mentioned a project-based assignment he had previously given to his students that involved "constructing a museum" where the "rooms" represented "different things that we had covered throughout the semester" (e.g., Civil War, the "importance of cotton", the War of 1812) (PD2, 9:20-10:44). And as he began to learn more about CFT, the teacher wondered if it would work in the future to ask his students to "tell (him) as many different perspectives that you can find about this thing (being discussed in class), and then…what your final summation about this thing is from what you found while you did your search" (PD2, 9:20-10:44). In response, the CFT Expert reflected on "where CFT could go" during such a "museum" activity, suggesting that even subtle changes to the instructions given – for example, Mr. R asking his students to also think about the impact of navigating the "rooms" in a "different order" (i.e., utilizing "different traversal patterns (or) sequence" between "rooms") – might help deepen their thinking further (PD2, 10:44-12:51). However, it must be noted that such efforts to identify potential "wedge points" were consistently underpinned by a desire to help Mr. R's students begin "*inching* down the road" towards deeper understanding in ways that minimized the risk of them getting too overwhelmed (PD2, 1:29:37-1:30:31) – a precaution strongly aligned with concerns about cognitive load noted in previous CFT studies (e.g., Spiro, et al., 1992; DeSchryver & Spiro, 2008).

3.5.2. Theme 3, Topic 2: [Response #1 to Theme 3, Topic 1] Acknowledgment of Mr. R's pre-collaboration steps to add "little wrinkles of complexity" (Strategy #1: M-A-I-N; multiple causation of WWI)

The collaborators' effort to properly acknowledge the "constraints" within Mr. R's teaching "reality" appeared to influence how the planning discussions unfolded in several noteworthy ways. First, building off the emphasis placed on keeping things "pretty simple" for Mr. R's ninth graders but nevertheless striving to add "little wedge points" to enable deeper thinking on their part where possible,

the researchers repeatedly lauded the pedagogical strategies that Mr. R had *"already in his teaching*" been implementing, even before the beginning of the collaboration itself, to add "little wrinkles of complexity" within his U.S. History instruction (PD2, 37:29-38:35; 44:56-45:54). For example, during PD2, Mr. R mentioned to the researchers his previous use of a "mnemonic for the causes of World War I": "M-A-I-N" (PD2, 35:11-36:13; 40:30-41:02). Within Mr. R's "reality", even as it was acknowledged that several concepts prominently involved in WWI's origin (i.e., militarism, alliances, imperialism and nationalism) would be difficult or "messy" for high school students to summarize or explain "in just a few simple words", that mnemonic was used to help facilitate deeper discussion of "what the messier things are" and how they interacted with each other in the buildup to that particular war's onset (PD2, 35:11-36:13). In the collaboration, M-A-I-N represented the first "wrinkle of complexity" identified as a key part of Mr. R's preexisting pedagogy: *his emphasis on the existence of multiple causation for historical events*. As elaborated by the CFT Expert, by identifying nationalism as one of many causes of WWI rather than the "single right answer" (PD3, 6:14-7:15), Mr. R was instilling a level of understanding that could serve as a stepping stone for his students to then utilize different facets of "that holistic CFT" – as expressed, in part, through the catchphrases that "shade into each other" (PD2, 38:35-40:30). To give several examples:

- It was argued that Mr. R's use of "M-A-I-N" could qualify as "a good example of 'cases come first'" due to how concepts like nationalism can "weave *through* different cases" across history, even as those "cases" might bear a "family resemblance" to each other (PD2, 36:13-38:35).
- In turn, Mr. R's acknowledgment of the existence of "multiple causes" of WWI was seen as avoiding the trap of reductionism, namely by explicitly demonstrating why "it's not that simple" and there is not a single cause that can be found on the Web or in general (PD3, 38:35-39:30).
- And finally, M-A-I-N was praised for encouraging "being open in understanding concepts", since "nationalism isn't just a definition" and how it emerged before WWI is likely to be "different, though similar" to how it emerged in other contexts (i.e., before other wars) (PD2, 38:35-39:30).

But on a broader scale, Mr. R's preexisting willingness to use resources like the "M-A-I-N" mnemonic to demonstrate multiple causation also instilled a renewed sense of optimism for the collaboration as a whole. Indeed, as the CFT Expert was quick and unapologetic in noting, Mr. R "saved our ass (i.e., the "asses" of the researchers) immediately with the perfect example" of what it might look like to "find little ways here and there to get (his students) thinking a little bit more in a way that fits the reality" of his classroom setting, while also better preparing them to enter "a messy world they have to live in, not just their jobs, where 'keeping it simple' is not going to work" (PD2, 50:54-52:10). And over time, efforts to recognize "little ways" Mr. R was already incorporating complexity into his lessons even

fostered multiple ideas for integrating CFT/LICRA itself into his classroom during future collaborative efforts (as will be later discussed). In this sense, it became a high priority for the researchers, when thinking about how to situate CFT (or any learning theory) into Mr. R's classroom setting, around the instincts the teacher *already had* regarding how to navigate the "constraints" put in place by his school.

3.5.3. Theme 3, Topic 3: [Response #2 to Theme 3, Topic 1] Treating students as "completely new, novel and…complex", and how similar treatment of historical events could promote "little wrinkles of complexity" (Strategy #2: "kind of similar"; "Going Down the Road Feeling Bad")

In turn, building off the explicit recognition of Mr. R as the "expert teacher" whose "milieu" would be prioritized over the researchers' during the collaboration, it was considered essential to learn more about the preexisting mindset underpinning his navigation of his teaching "constraints". In particular, Mr. R noted that he "came to teaching late", alluding to his time spent in retail management before transitioning into teaching when "already in (his) forties" (PD1, 58:19-58:42). And as a result of learning "how to treat people *as people*" within that professional context, as a teacher, Mr. R was unwilling to base his interactions with students on a short-sighted impulse to "beat 'em over the head with a stick" to obtain a certain level of performance on a given standardized test or assessment (PD1, 58:42-59:28). On the contrary, he made it clear that a critical component of his pedagogical approach involves his need to "accept that every person that walks in the door (of his classroom) is a person", and that each student he teaches is entitled to be treated and respected as "a completely new, novel and complete and complex individual that is in front of (him)" (PD1, 58:19-59:28). The CFT Expert immediately regarded such a tenet as "*crucial*" and worthy of being "underlined", explaining that it indicated a "really important meeting ground…between teacher and researcher" within the collaboration – namely, "a strongly anti-Platonist, anti-essentialist" approach to education that is built on "individuality, customization, (and) personalization", rather than lumping students into reductive "categories" that can then be inappropriately used to "treat" the learning needs of those placed "in (one) category the same" (PD1, 59:28-1:00:41).

But interestingly, the CFT Expert then proceed to build upon that "meeting ground" to point out another that might be implied from it. More specifically, building off both that aspect of Mr. R's "epistemology" and the notion that CFT is centered on approaching ISDs with "anti-essentialist, anti-typologist, anti-Platonist (or) 'put people or events or whatever in a category' thinking", he did not want to "put words in (Mr. R's) mouth" but wondered if he would be open to "say the same thing about history…about historical events" (PD1, 59:28-1:01:31). The CFT Expert's rationale was that while some historians have taken a "typological" approach by presenting history as fitting in "this category of events" or another, others like Michelet have emphasized that "every event is unique", a "contextualist weave" that consists of "a tapestry of many different individual events and people" that one cannot easily

"categorize under some higher-order typology"; and thus, he was curious what Mr. R's outlook might be (PD1, 59:28-1:01:31). Such a view of history (i.e., that "the French Revolution isn't just another French revolution") was immediately supported by Mr. R, who thereafter made explicit his understanding of history as "a fucking mess" – much to the CFT Expert's immediate delight (PD1, 1:00:41-1:02:06).

And indeed, this intersection between Mr. R preexisting appreciation of the "individuality" and personhood of his students with the collaborators' shared recognition of the uniqueness of every historical event (and of every student) was noticeable on multiple occasions, particularly when he discussed his efforts to identify sources (e.g., media) for making historical topics more impactful for his students. On the one hand, building off his students' direct feedback and his understanding of their lived experiences and interests, Mr. R explained to the researchers his need to be sensitive to their preference for a "story" to help them "care about the things that we're looking at…(and) feel something" about what is being taught to them (PD4, 16:22-17:33). For instance, returning to the example of the Vietnam War mentioned earlier (i.e., under Theme 1), Mr. R observed that part of why his students initially "fell asleep" to the documentary "Hearts and Minds" was because they lacked an "emotional connection to the characters in the story in the film" (PD4, 15:32-17:33). With this in mind, in addition to "Green Berets" offering "characters and plot" that made the subject matter more engaging and opportunities to help his students "look below the surface" of media depictions of the Vietnam War, he chose to show the film because alongside John Wayne, the film also starred George Takei as a "Vietnamese captain" (PD4, 17:18-17:52). And his presence offered students an "emotional connection" due to their already being familiar with him as "an LGBT advocate and internment survivor", largely due to Mr. R's prior lessons (PD4, 16:22-18:48).

On the other hand, beyond the goal of being emotionally supportive for his students, Mr. R's efforts when choosing sources also served as a way for him to better highlight "relevancy in the instruction" itself, particularly in terms of showing how "it somehow is relevant to something today" (PD2, 1:12:32-1:13:25). For example, even as his students were able to move beyond their "initial objection" of "The Grapes of Wrath" being filmed in "black and white" to "buy into" the film's "strong" performances and "powerful" images, one of the songs it includes (i.e., Woody Guthrie's "Going Down the Road Feeling Bad") was perceived by them as "kind of a snoozer" despite it being about the relatable topics of "struggle and loss and life" (PD2, 1:12:32-1:14:11). In response, at the start of the following day's class, Mr. R was ready to show John Mayer's more recent performance of the song on the David Letterman Show, which was "totally updated" to feature a "new soundtrack, new bass line" and Mayer himself "really ripping it down the guitar" (PD2, 1:13:25-1:14:11). And from there, Mr. R expressed that he was ready to lead a discussion with his students comparing the two performances of the "same lyrics", in terms of what things "happened between the two versions of this song" and what that might suggest about "what's happened in America" (PD2, 1:14:12-1:14:32). Beyond acknowledging the value of

making such music feel more "accessible" and less like "old…music", the CFT Expert commented that such a pedagogical step could foster deeper reflection on how "people feel bad then in certain ways, and now they feel bad today in certain ways" (PD2, 1:14:58-1:15:54). And even as he recognized the merits of discussing how some themes in the song "keep going to today" and "how history is pertinent to today" (e.g., the impact of homelessness and unemployment, even with "a bit of a safety net"), he pointed out that students watching Mayer's performance could also be encouraged to consider how the "implications" of singing the song might be "different today" than "in the Great Depression" (PD2, 1:14:58-1:15:54).

Eventually, such a regard for historical events as being "kind of similar, kind of different" led to the identification of a second "relevant" "wrinkle" that Mr. R was using in his existing pedagogical framework to "open that door to slightly more complexity" for his students – namely, *his simultaneous recognition of both similarities and differences between different historical events* (PD2, 1:16:57-1:19:34). In this sense, from the CFT Expert's perspective as a CFT researcher, by not endorsing "the traditional 'right/wrong'…black and white, dichotomous, either/or" mindset often promoted within U.S. schools and standardized testing, Mr. R was not only giving meaningful support to his students, but also better "*getting* at that reality" of how history and the real world is – as opposed to how they are often presented by "an in-school fiction that doesn't apply to the reality outta school" (PD2, 1:16:57-1:19:43).

3.5.4. Theme 3, Topic 4: [Response #3 to Theme 3, Topic 1] Integration of Mr. R's "little wrinkles of complexity" (or CFT) within existing curriculum, particularly compared to what is presented in textbook (Strategy #3: "examples" for diff. perspectives; "12:00 High" vs. "Grave of the Fireflies")

Finally, because it was critical to frame integration of CFT around how it could potentially fit within Mr. R's pedagogy, considerable attention was also given to ascertaining how his steps to deepen his students' understanding tended to interact with the professional expectations already being placed upon him (e.g., the curriculum he was expected to cover by school administrators). With that in mind, even as the researchers acknowledged the "*constraints* on what underpins (Mr. R's) approach" to teaching when trying to promote a deeper "understanding of history and its complexity", they were also eager for him to share any anecdotes that might highlight what promoting changes in thinking that are "kind of CFT-ish" might look like in relation to how his lessons typically unfold (PD3, 39:17-40:32; 52:39-53:48).

For example, in response to the CFT Expert emphasizing the importance of helping students avoid "oversimplification" when thinking about historical events by encouraging them to "think multiple" (e.g., "multiple causation, multiple answers, multiple perspectives") instead of looking for the "single right answer", Mr. R acknowledged that he might not use an "exact catch phrase" like "think multiple instead of single" to convey such a sentiment to his students (PD3, 6:14-7:42). However, to explain to the researchers what he'd done in the past to convey such a "multiple" approach to understanding American

history, he shared an anecdote about his efforts to help his students more fully explore "the story the textbook weaves about World War II" beyond the curricular standards (i.e., beyond "highlighting what they're gonna have to know for a test…so that grades can be produced and parents can be happy") by drawing additional attention to the "collateral damage" inflicted by "American bombers (that) were used in England to begin daytime bombing raids in Germany" (PD3, 7:42-8:38). More specifically, he showed the film "Twelve O'Clock High" what that aim in mind. And even as Mr. R acknowledged that "it tells a very good story" about the historical event, he was nevertheless concerned about whether his students could look beyond "American bombers bombing Germany" to more thoughtfully reflect on "the lives being affected here" and how "people die" as an inherent part of war – a viewpoint that he felt was not something he could "really *test* them on" or meaningfully assess if he went strictly off what was laid out in his textbook (PD3, 8:38-10:09). In order to address such a concern, at "the other end" of his unit on WWII (i.e., the portion focused on "the Pacific"), he chose to "bookend" "Twelve O'Clock High" by showing "Grave of the Fireflies", a movie about "these two children (i.e., Setsuko and her older brother Seita) who have to try to make it after their city's been fire bombed" but eventually die from starvation (PD3, 9:24-10:09). And as Mr. R reported, once his class had "digested little pieces" of the second film and had the chance to discuss it afterwards, the following moment took place (PD3, 10:09-11:40):

> "And the question that I hit the kids with – which really…it's the greatest question I ever asked about the movie and made it, hands down, the best film about World War II – the question I asked the kids was, "Who's responsible for Setsuko's death", right? And then…I could just watch their heads spin off. And there were just these really incredible long moments of silence, where you could see 'em in their heads, they're replaying back and trying to figure out, in their own minds, with what they saw and what they experienced, who was responsible for Setsuko's death. And after we did this big thing, with everybody kind of putting in their two cents, the conclusion is that we're all at fault for Setsuko's death. And they walk outta the room with this really crazy idea that we maybe we shouldn't have war at all, because of, you know, the destruction that it brings to everything. And so, that was…a moment where I think they saw lots of different things, lots of multiple personalities and how things all kind of pulled together like that.**"**

By recounting his efforts to pose the question of "who was responsible for Setsuko's death" without letting his students reductively assign blame to a "single" cause, Mr. R displayed a readiness to seize upon opportunities within his teaching constraints to help his students better appreciate how "lots of different things, lots of multiple personalities" can interact and affect each other during historical events like WWII, even if that means going beyond whatever "dry stuff" from the textbook assigned for his

"curriculum" might be able to offer (PD3, 8:38-13:19). Just as critically, the CFT Expert praised Mr. R's use of "Grave of the Fireflies" (and, in particular, the notion that "we're all responsible" for Setsuko's death) as a "third great example" of his preexisting ability to incorporate "wrinkles of complexity" into his teaching even without having "much time" to do anything other than "get(ting) 'em ready for tests": *his use of "great examples" to highlight the existence of "multiple perspectives… (and) different ways to see things"* (PD3, 11:40-15:20). But even further, he observed that such a presentation of "multiple perspectives" could "implicitly" encourage Mr. R's students to have "bigger, deeper thoughts" about whether "maybe somebody's morally wrong" during historical events like WWII, while also avoiding the temptation to normatively tell them "they're the right side, they're the wrong side, you are to blame" in ways that could result in "parents complaining" (PD3, 13:19-15:20). Put another way, beyond offering the chance for the collaborators to dissect and appreciate Mr. R's past "genius moment(s)" as an educator, learning about the "wrinkles of complexity" he already had experience using effectively fostered greater optimism for his preparedness to use "*complexity* as a cover" during future stages of the collaboration when integrating learning theories like CFT within his teaching "constraints" (PD3, 14:17-16:08).

3.5.5. Theme 3, Topic 5: Current assessments' ability (or lack thereof) to foster appreciation of history's "mess" and/or complexity, particularly within Mr. R's current school setting (MEAP; Star Spangled Banner; Zen nature of "CFT novelty"; "conceptual blinders")

But eventually, as the collaborators sought to identify "actual pedagogy" that could be implemented in ways that were both research-informed (i.e., aligned with prior CFT/LICRA research) and "practical, doable, and desirable to do" from a practitioner's point of view (PD6, 28:01-28:40), there was a need to consider *why* there were often clashes between Mr. R's efforts to incorporate "little wrinkles of complexity" into his lessons and the "constraints" in place within his school context. From early on, Mr. R expressed his sentiment that his school's administration was going "exactly in the opposite direction" than what he believed was needed to engage his students beyond "preparing for a multiple-choice test", as the CFT Expert put it; and from the teacher's point of view, such a trend was underpinned by a "constant pressure to get standardized, to adhere to the standards, to follow the standards, to test the standards and make sure that your assessments match the standards" (PD1, 45:46-49:50). He pessimistically admitted that such a "constant pressure" ultimately demanded a "certain pace that you have to follow", which left him with "no room…(to) try to get (his students) to think about things differently" beyond trying to "show them a film perhaps" or something similar (PD1, 48:32-49:50). And at least to some degree, Mr. R's bleak outlook stemmed from previous experience – namely, appreciating administrators who sought to integrate meaningful assessments (e.g., creating a "portfolio" meant to focus on "how…two documents were interrelated and then not interrelated in some way", which would then be presented to "members of the community"), only to watch them get "pushed out" of his school over time (PD1, 46:43-48:32).

In response, the CFT Expert first reassured Mr. R that his efforts to incorporate different media (e.g., "The Grapes of Wrath" to discuss the Great Depression) actually served as a "perfect example" of how a teacher could use what is at their disposal to "achieve some other learning goals" beyond just preparing students for standardized tests, such as "help(ing) a little bit on the engagement, and…provok(ing) this kind of 'What does this all mean?' discussion" (PD1, 49:50-51:15). From there, he made it clear that this study was built upon the understanding that Mr. R would need to "get those kids ready for those standardized tests" and that there was merit in simply exploring the process of "CFT becoming part of the learning theory that informs what you do, *given the constraints you are operating under*" (PD1, 49:50-51:15). Namely, it could "*point* to a future" when Mr. R's school, those "those big corporations…(who) influence the state school districts" and society as a whole would be "*forced* to change" how they approach education out of necessity (PD1, 51:15-53:02). But in the meantime, building off their shared desire to help students learn how to navigate "the real world and *mess*" as "a real place where our epistemologies intersect", the collaborators brainstormed how students' attainment of "21st century skill goals, deeper learning goals" might be meaningfully assessed within Mr. R's classroom setting under the constraints that it was currently forced to navigate (PD1, 51:15-53:02; 1:01:38-1:02:06).

As a starting place, after acknowledging that any assessment Mr. R used would have to account for "the constraints of the past that are still part of the present" (PD1, 51:15-53:02), the sentiment was expressed by the researchers that any exploration of "key concepts" in U.S. History should avoid trying to find the single best "two-sentence definition" to apply across all cases (PD3, 58:23-59:20). In particular, the CFT Expert lamented that teachers should be given more chances to encourage their students to appreciate how there can be "many ways to define…(and) many ways to think about" those concepts, depending on the unique contexts (i.e., specific moments in history) that they are being applied to (PD3, 58:23-59:20). To support his stance, he critically alluded to the MEAP (Michigan Educational Assessment Program) standardized test and how it asks students to "write a letter to the editor using…three core democratic values" (e.g., freedom, liberty, equality) to discuss "some topic of (the) moment" (PD1, 1:18:45-1:20:39). The CFT Expert's criticism largely stemmed from the fact that "every history teacher (he) talked to" indicated the impossibility of preparing students to complete the task with simple "definitions" (a sentiment that Mr. R, judging by his instant negative reaction to MEAP's mere mention, appeared to strongly agree with); and in his mind, that further justified his opinion that the "right way" to teach those concepts is to instead highlight how they "*in reality*" are "used in lots of different ways" that are often "messy" and highly variable in nature (PD1, 1:19:36-1:20-39; PD3, 58:23-59:20).

And from Mr. R's perspective as an experienced high school teacher, the reductive understanding of history often promoted by assessments like MEAP fueled his sense of urgency to identify moments when he could try to make the complexity of historical concepts and events clearer for his students (i.e.,

in ways that went beyond trying to have them remember oversimplified "definitions" to pass a given test). To give one notable example, going off the notion that being "reciprocally adaptive" in LICRA Web searches involves being open to "use what you are finding on the Web in your searches to change direction for what you're looking for" next (PD4, 47:57-49:09), Mr. R shared a story from when his lessons focused on the 1960s. In that case, students responded to his efforts to discuss Jimi Hendrix's rendition of the Star-Spangled Banner (e.g., how his guitar work was meant to "emulate the fireworks of the war…you know, 'the rockets' red glare' and all that") by being "*very* vociferous about the fact that that was not music" (PD4, 49:28-51:31). In response, Mr. R chose to play Whitney Houston's performance of the song from Super Bowl XXV for his students for "comparison" – a choice that led to an "emotional reaction" all around, which he explained in the following manner (PD4, 50:27-52:33):

> "But *then*, I was like, 'Hmm, you know, you're right. This is a bit over the top, so let me try to find something else. Okay, I'm gonna find another version of 'The Star-Spangled Banner', and we'll do a comparison of the two 'Star-Spangled Banner(s)'. […] The one that comes to mind that evokes an emotional reaction in *me*, which I didn't think was gonna be so strong that day, was Whitney Houston's version that she does at Super Bowl 25. And I played the video for the students and I know they had an emotional reaction, but I cried. And I'm like, 'Oh my goodness, we need to analyze this. Why is, why is Mr. Runyon crying during Whitney Houston's version?' And it was the crowd. It wasn't Whitney as much as it was the crowd. Everybody had a flag in their hands. Everybody was singing the words to the song. Everybody was being as American as they possibly knew how to be in that 3 minutes and 34 seconds.
>
> And now, we had a place to move, right? Which is, 'How were those crowds the same, and how were those crowds different?' And, 'What's going on that some people have an emotional reaction to this one, and others have an emotional reaction to that one?' And I couldn't get into it before class ended, but we're gonna go somewhere with that one."

Even though Mr. R expressed regret at not being able to do everything he wanted to "before class ended", the CFT Expert nevertheless commented that comparing those performances was an "interesting…(and) really cool" way to show "variation within similarity" across historical events – or as he ultimately put it, to emphasize that "not every 'Star-Spangled Banner' is created equal, a rose is not a rose is not a rose" (PD4, 51:31-52:48). In that sense, building off what was covered earlier, anecdotes like this modelled how specific concepts like "patriotism" might be feasibly put to the "*real. world. test.*" even within the constraints of the teaching context Mr. R had to navigate (PD4, 52:48-53:07; PD6, 30:19-31:59).

And over time, the collaborators began to speculate upon what Mr. R's integration of CFT principles (both beforehand and as a part of this teacher-researcher collaboration) might ultimately suggest about *how* assessments being used in U.S. education might be "forced to change" in the future. For example, after the aforementioned allusion to Heraclitus (i.e., "you never step in the same stream twice") was brought up again during one of the later planning discussions during dialogue centered on "what CFT novelty is", Mr. R expressed his feeling that such an understanding of "novelty" sounded "very Oriental…very Zen" to him (PD5, 40:18-41:37). In response, the CFT Expert very eagerly agreed with him that it was "*very* Zen" and pointed out that Zen is known to help confront the "problem" of humans having "conceptual blinders" – that is, cognitive biases underpinning our tendency to overlook "what's novel, special and unique about (a) particular situation", in favor of trying to "*squeeze* it into our plaster-cast boxes…another example of something we've seen" to create "cognitive ease" for ourselves as we respond to it (PD5, 41:37-42:41). Connecting this idea to Mr. R's teaching environment and what current assessments are often designed to do, the researchers expressed the sentiment that standardized tests, in their effort to have students "go for that singular sort of 'right answer'", are simply unable to "deal with novelty of this kind" or encourage students to apply their knowledge for "dealing with novelty, figuring out what to do here, what's going on" during novel situations that are not quite the same as "cases" they have previously encountered (PD5, 42:13-43:05). In this sense, even as the collaborators built off Mr. R's previous pedagogical efforts to brainstorm how "deeper learning goals" might be assessed within his teaching "reality", they also consistently bonded over their agreement that changes must be made to the systems underpinning K-12 schools (and their forms of assessment) due to how they undermine teachers' efforts to promote the sort of understanding and situational adaptability CFT extols.

3.5.6. Theme 3, Topic 6: Beginning reflections on which resources and logistics might potentially be needed for integrating "longitudinal" projects involving CFT/LICRA into Mr. R's existing classroom "reality" ("little incremental opening up"; "baby steps")

Finally, as different facets of Mr. R's struggles to navigating the "constraints" of his teaching "reality" were discussed, the collaboration appeared to organically gravitate towards reflecting on what resources and logistical steps might actually be useful for offering him support. In particular, it moved the researchers to hear that even as Mr. R hoped that he had at least given his students some opportunities (e.g., when running his "museum" learning activity "about 10, 12, 13 years ago") to more freely explore "whatever rabbit holes they want to go down" related to the topics covered in his U.S. History curriculum, he nevertheless expressed deep regret at not being able to use a more "longitudinal" approach in the past to examine "how my teaching might have changed over a few years, or how (his students') perceptions of the same things might have changed" as a result of such instruction (PD2, 12:51-13:34). In light of Mr. R's vulnerability, even as the CFT Expert assured him that the goal of the collaboration was to "*add* to"

his existing pedagogy that was already "fantastic, great, way better than most kids get in their teaching", the researchers came to display an eagerness to empirically examine how "additions" involving CFT might be utilized to support Mr. R's teaching goals in such a manner (e.g., monitoring students' responses to the "museum" activity when told to think about what might change "about (their) understanding about Room C if, instead of going to it after (Room) B, (they'd) gone to Room F first") (PD2, 13:34-14:55).

Thus, the focus of the planning discussions gradually shifted towards brainstorming what "baby steps" might facilitate Mr. R's efforts to "incremental(ly) open up" his students' thinking within the bounds of his existing professional constraints (PD2, 17:12-17:50; 1:26:45-1:27:55). The reasoning underpinning such a focus was as follows: given American schools' ongoing push to have K-12 students "learn something simple so they can answer the standardized test questions or whatever that they're eventually going to get", even if the collaboration's efforts appear to foster seemingly minor outcomes in a particular study or classroom intervention (e.g., greater student recognition that concepts like freedom or justice "don't just have a single meaning"), those findings could lead to the discovery of broader pedagogical strategies that teachers like Mr. R could thereafter use *within the current educational system* to help their students gradually develop the belief that history is actually "complex and interesting" to learn about – which the CFT Expert firmly denoted as the "*single biggest* mindset change" that he could envision as an cognitive theorist (PD2, 33:27-35:11; 1:26:45-1:27:55; PD3, 17:05-18:45).

That being said, there are two key points worth emphasizing at the end of this section. First, as the collaboration sought to identify what could be done in Mr. R's classroom to "put together teaching, and teachers who know about classrooms, with these ideas from the Ivory Tower", in order to foster learning outcomes that are "desperately needed" by students but "very hard" to promote in "traditional schooling", the pursuit of such a "good collaborative translation of theory into practice" was underpinned by an ongoing cognizance of the need to be realistic about what logistics, resources and navigation of systemic constraints might be required to make such integration of theory possible (PD6, 18:05-19:24). And second, as the next section further explores the "lessons learned" from Mr. R's initial attempts to "apply some of those catchphrases or ideas" associated with CFT to promote positive learning outcomes in his students (e.g., discovering a need to "attach a grade to it" to "get a large response initially" due to their being "mostly 14 (years old)", directing his integration of CFT "around concepts in each unit", using feedback to "get the hook in deep enough" to help them "think deeper and deeper and deeper"), it is important to remember that the teacher and researchers held a shared sentiment that any attempts to "let loose" the CFT "animal" within Mr. R's classroom settings would have to be "incremental" in nature, lest such efforts disrupt his existing curriculum or overwhelm his students too much (PD6, 18:05-21:08).

3.6: Theme 4: Interaction of Mr. R's Pedagogy and CFT "Lenses" Within His Classroom Setting

3.6.1. Theme 4, Topic 1: Impact of students' experiences on Mr. R's lesson planning ("not overwhelmingly a white majority"; "n-word" cafeteria incident)

When discussing more fully how Mr. R's pedagogy interacted with the CFT "lenses" introduced to him over the course of the collaboration examined for this study, it is critical to first highlight that from the beginning, he framed his experiences in teaching (especially over the past half-decade) as being built around the notion that "no significant learning happens without a significant relationship" between the students and the teacher (PD1, 58:19-59:28). And in pursuit of that goal, a major facet of Mr. R's pedagogy discussed at length was his desire to both appreciate and duly account for the lived experiences of his students. For example, in response to the CFT Expert expressing his concerns that lessons on controversial topics "might not play well with parents" potentially willing to use "school board meetings" for the purpose of "getting teachers fired" (PD3, 27:00-27:58), Mr. R pointedly cited the demographics of his students as he described his classroom setting in the following manner (PD3, 28:23-29:49):

> "…you have to know your audience, right? The demographics of the school are a bit different than what I actually see in my classroom…I think it kind of averages out to, what do I think it is? About 15, 15-20% could be black. Then I would say, you know, 20-25% is Hispanic or something in there…and the majority is white, but it's not overwhelmingly a white majority. It's like, maybe, 51% or something like that is the white majority. So when I teach, I wanna teach both my audiences the truth. 'Cause, you know, the black audience already knows the truth. So I get their attention and their respect because they know that I'm teaching the truth. And then, it's a matter of discovery, of, 'Hey, guess what guys? You've been living this thing, thinking that it's all like this, but honestly, it's just a wee bit different than that.'"

In essence, Mr. R was quick to point out an ongoing tension in his teaching – namely, between needing to acknowledge the backlash that might come from certain parents and the "attention and…respect" he would lose from his "black audience" (and potentially other marginalized students) if he chose to cave into pressure from said parents to gloss over or minimize "the truth" about historical events covered in his U.S. History curriculum. In the end, he was adamant in declaring that for him, it was worth taking a professional risk that might lead to "30 years retirement" if it meant he could create a learning environment where the "the truth" was presented in ways that would allow his students to reap the benefits – albeit in different ways, with marginalized students already knowing the truth but feeling

heard, and "the white majority" being exposed to a different (and likely far deeper) understanding of America's past than they might otherwise be exposed to from their educators or upbringings (PD3, 27:00-29:49). And for the researchers, hearing such a sentiment from Mr. R cast a different light on moments during the collaboration when he recounted how he has framed his instruction around topics or events that his students directly witnessed or were more sensitive to, such as the aforementioned example of him covering Truman's desegregation of the military in the midst of an incident at his high school involving a fight between a cafeteria worker and a student over the latter's use of the "n-word" (PD4, 14:04-14:39):

> "And (the cafeteria incident) was all over the "n-word", right? And so that very next day, I think, was my lesson where very clearly, you know, there were people saying the "n-word" in the readings that we had. And I had to figure – I had to kind of negotiate not saying the "n-word", which I hadn't planned on doing anyway, but just making sure that the students noticed that yes, the "n-word" is there in the text, but we don't have to say it, you know? 'Cause I mean, you're all reading it and you all see it. You're all really hypersensitive to it right now. So that was kind of an interesting little part of the course."

As reflected by this anecdote, even as Mr. R was quite aware of how "there's always a couple parents that are thorns in your side" and thus probably anticipated that some of them would not be happy about him discussing how some of Truman's "close friends" discouraged integration and invoked racial slurs to do so, he appeared to be unwavering in his desire, as a teacher, to acknowledge the existence of racism and other unflattering aspects of society and thus more fully capture how historical events unfold – albeit with emphasis on sharing such details in a manner both matter-of-fact and sensitive to his students' feelings (e.g., their being "hypersensitive" to hateful language, either due to their racial identity or in light of recent events) (PD3, 48:47-49:52; PD4, 13:06-14:04). And indeed, he seemed to also be driven by "the truth" that many of his students were likely enduring similar mistreatment in their own daily lives.

3.6.2. Theme 4, Topic 2: "Froggy" and less "student-like" nature of Mr. R's students currently ("better kids"; who might "really benefit from the feedback")

But even as Mr. R laid out his pedagogical approach toward creating classroom experiences (including appropriate use of media) both sensitive and responsive to his students' lived experiences, the aforementioned potential emergence of "a couple parents that are thorns in your side" and "never…go away" was not what appeared to concern him most within his teaching context (PD3, 48:47-49:52). Rather, what he repeatedly expressed strong frustration with was his students becoming "really froggy" – attributing such a development in part to the COVID-19 pandemic, but also noting it as a byproduct of the ever-increasing pressure from schools to base student growth on their adherence to "particular standards"

rather than their becoming "independent, critical thinkers" (PD3, 48:47-49:52; PD1, 41:57-42:52). And by "froggy", he alluded to the "unique situation" where his current students had begun to "exhibit the least student-like behavior" of anyone he had ever taught, stating emphatically that "they don't give a *shit* about anything" and that he'd come to feel like he was "only teaching to about five students, maybe" in any given class he was teaching at the time that the planning discussions began (PD1, 41:57-43:16).

After these teaching conditions were shared with the researchers, the CFT Expert responded to Mr. R's grievances on multiple levels. First, citing "terrain I have to operate on a lot when I give talks", he expressed his steadfast belief that schools will soon receive immense "pressure" to begin prioritizing helping students become workers capable of "innovation" as opposed to "just know(ing) facts" that they use in a "non-thinking" way; and he envisioned such pressure coming not only from "the same people who got us into that mess (with standardized testing) in the first place" (i.e., "business (and) corporations" striving to operate within a "global, competitive environment"), but also from everyday people who have "pragmatic interests in feeding their families and getting jobs" in the future (PD1, 43:16-45:46). In saying this, he sought to reassure Mr. R that "right around the corner", schools like his would need to become willing to promote "21st century skills, and this idea of learning how to think creatively" with the sort of mindset he was aiming to promote if they wished to survive as institutions (PD1, 43:16-45:46).

And second, the CFT Expert made note of the "spectrum" of students Mr. R reported encountering in his class – from those caught "sleeping" or disengaged, to those "actually *thinking* about what you're saying", to those "wanting to pay attention, struggling to pay attention, trying to pay attention" (PD2, 58:15-59:57). In response to this summarization, he suggested that "just to make things easier" during the collaboration and "for the purposes of this CFT-focused study", it would be alright to "say something simple" about the disengaged students (e.g., "they were sleeping, (so) they're not data here") and thereafter "emphasize more" any anecdotes that involve the responses to CFT/LICRA instruction displayed by "the students in the front who are thinking" (PD2, 1:01:05-1:02:01). Put another way, from the CFT Expert's perspective as an education researcher when thinking about what might be "bottl(ed)…for the future" from this study, he argued that the collaborators' time and energy was better spent examining how CFT resonates or doesn't with "the ones who are at least paying attention and trying…who are really are educable for this alternative way of thinking so different from the reductive, 'traditional schooling' way of thinking" (PD2, 1:02:01-1:03:08). And indeed, such clarification early on from the researchers appeared to successfully pave the way for a shift in focus towards discussing what was within Mr. R's control in his classroom setting (and, in turn, what was within the collaboration's capacity to explore within that context) – as evidenced by an increased focus on practical topics like what might constitute good student "participation" (PD3, 45:31-47:24), what pedagogical strategies could "get the hook set in deep enough" to encourage deeper thinking (PD6, 20:22-21:08), and how to tell which

students might "really benefit from…feedback" that is aligned with the CFT "lenses" represented by the catchphrases shared with Mr. R and thereafter discussed across the collaboration (PD6, 21:16-21:38).

3.6.3. Theme 4, Topic 3: Anecdotes about end-of-year activities involving "freedom", Part 1 ("Call to Freedom"; "big, huge scan"; "struggle" responses)

Once such understanding was gained about Mr. R's classroom setting and what was within the collaboration's control to undertake with that learning context in mind, conversations began to gradually shift towards discussing how exposure to certain CFT "lenses" (i.e., those represented by the catchphrases) might affect his teaching strategies *given* the constraints he was under. In particular, the researchers made it a priority to explicitly ask Mr. R to journal or report "anything building…(or) accelerating, either in your thinking and what you do in class or what you're seeing from the students," over the course of the planning discussions, while also making it clear that "any *little* tiny thing….*any* slight movement" that indicated a "new way of thinking" was worth documenting (PD4, 34:00-35:09). However, it the researchers also strongly emphasized the need to have realistic expectations regarding how much of a change in students' thinking Mr. R might end up reporting. This was partially due to the later planning discussions taking place relatively close to "the end of the (school) year", thus leaving a very limited amount of time and few opportunities for Mr. R to explore how CFT might help him promote a deeper way of thinking about U.S. History to his current students – unless, as the CFT Expert joked, Mr. R was willing to ask them "if they mind sticking around for another extra week before starting summer vacation" (PD5, 29:08-29:26). In addition, by nature of this study's methodological design, no data could be directly taken from students and they could not be discussed in an identifiable way – thereby placing a noteworthy constraint on the collaboration's ability to document the "reality" of the classroom setting.

Nevertheless, the CFT Expert offered his reassurance that while "we *will* do studies in the future that do look at that (i.e., CFT's impact on Mr. R's students' learning) better, under better circumstances", for this first iteration of the collaboration, identifying "glimmers" of changes in students' thinking was "all we want at this point…all we need" and served as "a simple goal" that "we don't need to fully achieve" (PD5, 29:27-30:29). Put another way, even if Mr. R simply shared a couple anecdotes about "a handful of the best students, five students in the class" thinking in slightly deeper ways (e.g., saying things like, "Wow, I never thought of that. Freedom isn't freedom isn't freedom.", "Freedom in the context of *this* historical event is different from freedom in *that* historical event.", "Freedom is used in different ways, but it's still freedom...and I used to think this.", etc.), the researchers noted such examples as themselves invaluable for offering meaningful insights for developing more formal research to examine the impact of CFT/LICRA within Mr. R's classroom setting in the future (PD5, 28:00-30:29). With this in mind, it is worth dissecting Mr. R's anecdotes pertaining to his implementation of his

"freedom" exercise over the course of the collaboration. As mentioned under Theme 2, near the end of the school year, he wrote and shared the following prompt with his students (PD5, 18:04-18:38):

> "The title of the textbook this year was "Call to Freedom". To the best of your ability, explain the meaning behind the phrase "call to freedom". What does it mean? And explain why did the publishers choose the title they did. You may use any resources that you have available to help you answer this prompt, including the Internet."

Due to when the exercise was assigned, Mr. R designated it as an "ungraded" activity; and thus, it was not surprising that their responses significantly varied in quality, with some producing work that seemed "quite good" to Mr. R and others appearing to give "no effort like you would expect" from at least some portion of his class (PD5, 19:21-20:14). On a broader scale, as previously alluded to, the unexpected approach taken by some students (i.e., using a "big, huge scan" of the textbook via its "index" as their primary resource, rather than the Internet) fostered reflection on the teacher's part regarding what instructional strategies might be most appropriate for such tasks moving forward (PD5, 19:21-20:14). But when discussing in greater detail the *content* of his students' responses, Mr. R seemed amenable to the CFT Expert's suggestion to focus on students actually engaged with his instruction when recounting his experiences. With that in mind, when the CFT Expert asked Mr. R to share "some of the takeaways" from what was said by "some of the better" students of his who appeared to "think more deeply than others" during the "freedom" exercise (PD5, 54:31-56:05), he proceeded to offer the following deidentified responses as noteworthy examples of the patterns of deeper thinking that emerged:

1. [From a student Mr. R had "never actually heard…say anything really in class."] "The textbook we used explained how different people struggled at times, describing the conditions poor people, the disabled, black, Asians, Indians, women, children, LGBTQ people, and more had to suffer through because they weren't rich, white, a man, cisgender, heterosexual, or able-bodied. I believe the textbook is called 'Call to Freedom' because it talks about how much people had to struggle to earn their freedom. It could also be called that because the textbook describes the wars we were in and how they affected us and other countries." (PD5, 56:05-56:48)
2. "Lots of people throughout history needed freedom, but a lot of their governments did not do anything about it. So they had to call on themselves to work for their freedom. Immigrants from Mexico came and got jobs and worked hard so that they could get freedom, as well as a lot of minorities. People also fought in wars for their freedom, and started protests and revolutions to give themselves freedom." (PD5, 57:37-58:03)

In a manner informed by his scholastic expertise, the CFT Expert praised Mr. R's students' responses as "very good…good stuff" due to how they recognized "freedom" as a concept capable of meaning "different things in different contexts" – even as he could not help but express his fear that if they could glean an understanding of "freedom" from the textbook that was less biased towards those who are "rich, white, a man, cisgender, heterosexual, or able-bodied", Mr. R might not be allowed to use it in his lessons if "somebody like Ron DeSantis becomes our governor" (PD5, 56:48-57:37; 58:03-59:04). But beyond this, the CFT Expert pointed out earlier in the collaboration that if Mr. R's students had the chance to use the Web, even for "a half hour or so", in ways that built on his prior efforts to showcase the existence of multiple perspectives (e.g., "different views of the Vietnam War"), such a chance to "find a lot of different *senses* of 'freedom', not the ones that *they* favor necessarily but the ones that *can* make sense in different contexts", could make the students' "heads explode a little bit" (PD4, 19:45-20:27). Perhaps with that scenario in mind, he appeared to put forth the argument that if Mr. R's pedagogy could capitalize on his students' responses to learning activities like the Web-based "freedom" exercise, such efforts could help them gain deeper "insights into meaning that they didn't have" and ultimately undergo a fundamental mindset change towards their learning of U.S. History more broadly (PD5, 58:03-59:04).

3.6.4. Theme 4, Topic 4: Anecdotes about end-of-year activities involving "freedom", Part 2 (follow-up exercise "already wrapped up"; "Arab Spring")

Building off discussions about the potential learning benefits from exposure to activities like the "freedom" exercise, the CFT Expert eventually asked Mr. R about the possibility of introducing an additional "summative" LICRA task aimed at promoting "deep and open searching and learning on the Web" in particular; and in response, Mr. R indicated that he actually had something "already wrapped up" and "in my mind" to be implemented as one of his class's last exercises for the school year (PD4, 18:48-20:27). As it turned out, in a manner that involved rescheduling the sixth collaborative planning discussion to give students "another day to turn (submissions) in if they were gonna turn anything in", Mr. R reported to the researchers that he was able to work on "a *little* something" before the start of finals week (PD6, 4:20-4:53). More specifically, he implemented another optional follow-up activity using an "instrument" that was meant to build off what the collaboration "had talked about", in order to ascertain (going off the CFT Expert's phrasing) what insights his students gained about freedom (and, in turn, their textbook's title, "Call to Freedom") once they were asked to "get on the Web and *try* to open up their searches instead of finding answers" (PD6, 4:32-5:13). It is worth noting that for this exercise, which was "still an ungraded assignment", Mr. R observed that he "almost had 25, 30 (students) respond" compared to "about 55 or 60" who responded to the first "Call to Freedom" exercise (PD6, 21:26-21:38). Nevertheless, he expressed optimism that the smaller portion of students who completed both tasks were

who he thought "could really benefit from the feedback", thus shifting the focus of the collaboration to how he might strategically provide CFT-based feedback during his instruction (PD6, 21:26-21:38).

At this point, multiple anecdotes are worth sharing from what Mr. R's reported pertaining to his students' responses to the "summative" activity (PD4, 36:47-36:48). First, in line with Mr. R previously noting that his U.S. History curriculum covered a period of time spanning from "the Second Industrial Revolution until just before 9/11" (PD2, 1:24:00-1:24:32), he mentioned one student who, "by what they wrote, they had to have done something online because they brought some ideas in about the about the Arab Spring" (PD6, 5:13-6:27). More specifically, the student cited that event to argue that "shutting Internet communication down was a part of (freedom) and how important it is that we have freedom of speech *digitally*, as well as just regularly having freedom of speech" – a take Mr. R admitted being "startled" by (PD6, 5:13-6:27). From there, when asked if there was any "indication" that the student was "opening up" their understanding of freedom, he noted that the student's insight – namely, that loss of freedom or "control of…speech" leads to losing "control of the truth" – was unexpected given how the student was "usually very quiet", citing it as further proof that "still water runs deep" (PD6, 6:27-8:01).

And second, when asked if students tried to connect their ideas of "freedom" to "a book and a whole course with the title 'freedom'", Mr. R shared multiple "succinct" responses reflecting various ways of understanding "freedom" that appeared to have at least some "direct link with our curriculum" (PD6, 8:01-9:48). Below are several examples that were shared with the researchers (PD6, 8:58-11:02):

1. Freedom to vote (which was summarized by the student saying that "if you can't vote, then you don't have the country that we have")
2. Freedom of expression (which, according to Mr. R, was anchored to a "contextual thing about North Korea, where they're brainwashed and we're not")
3. Freedom to protest (Note: not further elaborated by Mr. R)
4. Freedom of religion (Note: not further elaborated by Mr. R)
5. A brief mention of "one student that talked about fascism", although Mr. R struggled to find that specific student's submission during the planning discussion

It is worth noting that the exact wording of the instructions for this follow-up exercise were not directly shared with the researchers during PD6. That said, it was observed that Mr. R's students did not appear to go through a "CFT exercise" that explicitly asked them each to "capture 10 different historical uses of freedom, all freedom but all different"; and in response to this, the CFT Expert proceeded to ask whether it would be possible for the teacher to "bring the class together on and talk about the different perspectives on freedom", in order to highlight how "everybody's right" to some degree (PD4, 11:08-

12:09). From his perspective as a CFT researcher, the CFT Expert reasoned that since historical concepts "*are* multifaceted" in nature, such a class discussion as a could serve as "a second step…a wedge in to open up (Mr. R's students') thinking" further, namely by encouraging them to be less "narrow in (their) denotative, definitional sense of concepts" through being receptive to their classmates' ways of understanding "freedom" (PD4, 12:09-13:38). And encouragingly, Mr. R agreed from a pedagogical standpoint with the merits of such an "second step", particularly if it would give his students the chance to "use their own responses to kind of initiate some discussions about what the meaning of freedom is" (PD6, 13:38-14:38). Thus, over time, the collaborators seemed to recognize the potential for activities involving CFT/LICRA through their ability to offer exposure to new understandings of historical concepts that Mr. R's students might not otherwise encounter, whether from the Web or their own peers.

3.6.5. Theme 4, Topic 5: Anecdotes about end-of-year activities involving "freedom", Part 3 (the importance of accounting for perspectives shared by students, including those they might have "internalized" beforehand; "freedom to be who you are"; "liberal safety net")

Alongside reflecting upon how to help Mr. R's students navigate the multitude of meanings discoverable for historical concepts both within and beyond their course materials (e.g., their textbook), the collaborators also pondered how they might respond to *preexisting meanings that students hold before entering Mr. R's classroom setting*. Indeed, concerns were raised regarding how such understandings from students could be integrated into Mr. R's instruction should they fail to align with the perspectives that he has been directed by existing standards to draw attention to in his curriculum. For instance, when recounting responses he received for the follow-up "freedom" exercise, Mr. R acknowledged that many of his students had already "internalized the idea of freedom", in the sense that rather than "thinking about it" and operating as if they "(had) to look at something online" to gain deeper understanding of the concept, they instead displayed a preference to use their responses to "talk about *my* personal idea of what freedom is and what it means to *me* to be free" (PD6, 5:15-6:27). And eventually, he expanded upon this observation by clarifying that for "quite a few" of his students, "what was really important is the freedom to be who you are" and such a freedom entailed not being "hindered by social constraints and religions and what people think and say" about "whatever it is that you wanna be" (PD6, 7:19-8:01).

While the aforementioned "succinct" responses (e.g., freedom of expression, freedom to protest) were cited by Mr. R when the CFT Expert asked whether his students made "any attempt to link up their ideas about the freedom to be *who I am*" to his course or textbook, the dynamic between Mr. R's curriculum and his students' sense that "social constraints and religion" were opposed to their understanding of "freedom" was unfortunately not explored further by the collaborators during the planning discussions (PD6, 7:19-9:48). That being said, part of Mr. R's excitement at the possibility of using his students' "own responses" to discuss the meaning of freedom within his classroom setting

appeared to be fueled by his valuing the possible insights that a given student's understanding of "freedom" could offer to their peers – or even to Mr. R himself (PD6, 13:38-14:38). As an example of the latter, he explained the impact of one student's response on him, commenting that he was initially unsure that "they knew what they were talking about" due to their response being "so short", only for it to "kind of open (his) mind" once he had the opportunity to think about it further (PD6, 13:38-14:38):

> "And they wrote, 'Probably freedom from homelessness, because people that are homeless can die. People on the streets can't make money. So freedom (from) homelessness prevents that.'
>
> So you have to really kind of think about them thinking about what homelessness is, which means, 'Okay, you're on the street. You can't earn a living, because you're living – yeah, that all goes together. That's all –"

The CFT Expert immediately interjected that the student was engaging in ""liberal safety net' thinking", in the sense that "if your government, your society doesn't guarantee that at least everybody will have a home and something to eat and healthcare, you are not free" (PD6, 14:38-15:04). And as he praised such a "brilliant" response, Mr. R himself expressed awe at how "simple" it was even as it "went someplace where I didn't know everybody could go" (PD6, 14:38-15:13). Such statements denoted a tonal shift within the collaborative space, from *being wary of* understandings of "freedom" not directly pulled from the course or textbook that might emerge to *embracing* when such understandings might be revealed. Put another way, the student responses seemed to promote *a change in thinking for the collaborators themselves*, whereby their sense of the "lots and lots of different ways" that freedom might "get used" was opened as well (PD6, 15:13-16:26). In this sense, even as the CFT Expert connected a willingness to "listen to this person talk about freedom, listen to that person" to a more "open" approach to historical concepts, the collaboration came to appreciate how validation of student perspectives within classrooms like Mr. R's – regardless of whether or not they align with the "right" understandings highlighted by a given textbook – could also foster a "different way of thinking" for U.S. History teachers regarding what could be valid to incorporate into their instruction as well (PD6, 15:13-16:26).

3.6.6. Theme 4, Topic 6: Anecdotes about end-of-year activities involving "freedom", Part 4 (potential use of "CFT-based, practical, in-the-classroom feedback" when offering students opportunities for better grades; "freedom from taxation"; Pledge of Allegiance)

But even as the collaborators discussed how they might build upon understandings of "freedom" that Mr. R's students shared, it was also noted how their responses could reveal misunderstandings embedded in their knowledge, as indicated by the following anecdote (PD6, 9:54-10:41):

> "This one kind of got me, 'cause I don't really understand if they understood what they were talking about. 'Cause they said 'freedom from taxation' is the most important one. I was like, 'Okay. Well, yes, I understand that in the sense that that was what our Founding Fathers were *super* interested in, but how is that…?'…So he chose that because, let me see what he said here:
>
> 'I chose this because at all levels of income, no one likes to see their hard-earned money stripped away. I also chose this because while taxing may not hurt the rich, it can hurt the poor. And how do taxes help when they basically kick people who are already down?' So he thinks that we *should* be free *from* taxation, so freedom from taxation."

As the CFT Expert guessed and Mr. R thereafter confirmed, the student meant to say "taxation without representation"; and thus, this incident served as an example of how learning activities like the "freedom" exercise could also serve a *corrective* purpose – namely, by offering insights about where gaps in knowledge might exist for students and in what ways (PD6, 10:41-10:52). But returning to what was previously alluded to, Mr. R was adamant that in order to use CFT-based instruction to support his students' learning growth (including correcting their mistakes), teachers would need to both "attach a grade" to such activities and "provide feedback" appropriately designed to get their students to "to do the work that you want 'em to do, which is to think" (PD6, 20:22-21:08). In response, the CFT Expert endorsed basing grades on Mr. R's students' ability to "enact these (cognitive) values" represented by "the catchphrases" during the collaboration due to how they encourage learning behaviors that steer one "away" from the temptation of searching for "the single right answer", such as generating "more questions, more potential answers", identifying "more variations in the way freedom was used in the book", accounting for "context variation" or "different perspectives", and recognizing "different possible solutions to…complex historical problem(s)" (PD6, 21:38-24:59). Thus, the collaboration began to dissect how Mr. R's pedagogical expertise could be built upon to develop a "new theory" for strategically implementing "CFT-based, practical, in-the-classroom feedback" that would be aligned with a strong emphasis on "thinking in this way that the world goes", as opposed to endorsing the false notion that "the world…(goes) in a line" and can be easily "organized into chapters" (PD6, 23:02-24:59; 34:45-35:49).

For example, when discussing how Mr. R could use "America's response to the bombing of Pearl Harbor" to discuss the concept of "patriotism", he offered the following scenario as one he might be able to "play with", though he admitted that he'd "never seen it actually done this way" (PD6, 24:59-28:01):

> "So let's say they just say 'patriotism' is saying the Pledge (of Allegiance), okay? So your initial response is, 'Is that the only thing that this means?' or something. You provide them some feedback, in order to dig a little deeper. […]
>
> And so, your feedback then would be, 'Is there any other way to think about patriotism than just saying the Pledge?' And so, you establish this feedback loop, per se, where if they continue to…bite the hook, and they write back with…, 'Well, I guess patriotism is more about defending your country, when you feel as though your country has been under attack by a foreign power.' 'Ah! Okay, well, good. Now, thinking about that, do you think the Japanese were patriotic when they attacked (Pearl Harbor)?'
>
> You know, you continually feed them little things that will allow them to build on this grade that they established with a simple idea first. But by kind of giving them feedback, and like a loop, you could help them to broaden their horizons, so to speak."

To summarize, by laying out a path for students to "*add* to the grade that they've already established" with their initial (i.e., potentially oversimplified) submission, Mr. R envisioned a type of formative assessment that could be designed to motivate his students on a case-by-case basis to think more deeply about their thinking patterns as they naturally emerge across different stages of a given assignment (PD6, 25:05-26:06). It quickly became apparent to the researchers how such an assessment could be strategically utilized to meaningfully offer feedback that is both individualized and capable of being aligned with whichever dimensions of CFT (or any other learning theory) Mr. R wished to expose his students to – in a manner that could empower his students to situate CFT as a "bigger tool to dig a better hole" (using Mr. R's own metaphor) for deepening their thinking about whatever historical topics or real world events they might encounter or have to learn about in the future (PD6, 29:26-29:59).

Thus, it came as no surprise when the CFT Expert emphatically expressed his appreciation for Mr. R "terrific" display of thinking "in terms of actual pedagogy, things you would do in the classroom, and us hearing something that is a perfect manifestation of an application of CFT" (PD6, 28:01-28:40). In particular, beyond "reinforcing that positive feedback, higher grade" in a manner that could boost student motivation, he argued that by proposing to "continually feed them little things" and thus make feedback "like a loop…to broaden their horizons", Mr. R had "invented" a "brilliant two-stage theory of feedback" that is "not currently a part of CFT" – namely, the use of "the grades, the feedback" to frame "the next step" of learning about a given historical topic under the notion that "assessment" of their learning "isn't over" after "one test", but rather, that the "the test is a *learning process* that continues"

(PD6, 34:45-36:29). In other words, rather than artificially anchoring the merits of the feedback to improving a grade administered for his course, Mr. R appeared to be proposing a revolutionary way of translating "those catchphrases and the cognitive values of CFT" into "something else they can do to get a slightly higher grade that, *again*, sends them in this deepening direction of thought" (PD6, 35:49-36:29).

Such a practitioner-based framing of learning U.S. History as something with value extending beyond any one classroom exam or standardized test was enough for the CFT Expert to espouse that Mr. R would be "center stage" when sharing key findings from the collaboration, in a manner that could have him depicted as "the most famous teacher of (his) era" (PD6, 32:01-33:07; 35:49-36:29). But beyond such praise, such conversations around what Mr. R chose to implement (or wished to someday) were encouraging in relation to "the goal of this project" that the collaboration itself was built around – namely, finding possible ways to meaningfully introduce CFT into his classroom setting in a manner that could lead to "a combination of…researchers, theorists (who) are happy on the one hand, *and*…something that makes sense to (Mr. R) as practical, doable, and desirable to do on the other" (PD6, 28:01-28:40).

3.6.7. Theme 4, Topic 7: Perceived relevance of CFT "lenses" discussed for Mr. R's existing way of teaching (i.e., where they are complimentary or at odds)

When discussing the relevance of CFT for Mr. R's existing pedagogy perceived by the collaborators, it must be first emphasized that while the focus of the collaboration evolved in response to his implementation of exercises involving his course textbook ("Call to Freedom") and the concept of "freedom" more broadly, the collaborators' intentions for this study were *not* to ascertain the effects of any specific intervention or even formally design one. Rather, the goal set out from the beginning was to simply document how the conversation between the collaborating researchers and teacher unfolded over time, particularly in relation to any mutual understandings discovered along the way. And for this aim, as the planning discussions explored how "different aspects of CFT interrelated to each other" might be translated within Mr. R's "practical reality" as a high school U.S. History teacher, high priority was placed on noting any "examples" he journalistically regarding how CFT might be used by him to "prepare (his) students to learn…(and) see just a bit more of these…ways of thinking" within his classroom setting (PD2, 29:46-32:30, 33:27-35:11). Indeed, Mr. R's anecdotes offered invaluable insights regarding how CFT appeared to be diametrically opposed to mechanisms "built into the system" that he had to professionally navigate; but the researchers affirmed the need to remember what was at the "heart of this collaboration", at least during its first iteration for the purposes of this study (PD2, 32:30-33:30). Namely, it was centered on the deliberate making of space for the researchers and teacher to share their perspectives with each other in ways that might serve as a stepping stone towards brainstorming what might be possible "*within* that fixed, *within* that given, *within* those constraints" in Mr. R's classroom

setting, in hopes that they might be able to incorporate "something little" that is "easy…to grade, (and) not distracting" but still able to help his students think in more "complex" ways (PD2, 33:30-35:11).

With this acknowledgment in mind, when asked "how effective (or) useful the catchphrases were initially" and "over time", Mr. R admitted that his class was "in review stage" (i.e., for final exams) for a significant portion of the collaborative discussions – meaning that there "wasn't a lot of opportunity" for his students to engage in "discovery" or "that kind of 'uncovering the truth'" promoted by CFT (PD6, 36:31-38:18). However, he did recall that there were "many times" when he himself used the catchphrases or "phrases" that were "similar" to them, such as "there are a lot of different perspectives here", "there are a lot of different ideas about what actually happened", "there's lots of input here", "it's chaotic", and "it's convoluted" (PD6, 37:05-38:18). To offer one example, returning to his anecdote about his lessons involving the My Lai Massacre and "how easy it was" to get Americans to commit that atrocity, Mr. R alluded to how CFT was influential in planning a discussion with the goal of getting his students to think more deeply about "what was going on in the minds of the officers, what's going on in the minds of the villagers, what's going on in the minds of the photographers" over the course of that historical event (PD6, 37:05-39:35). Because his students were in "the stage of review", Mr. R had to settle for presenting it as a "'this happened' kind of thing", since he could not offer his students the time and space necessary to "really think about what the consequences of all that meant" (PD6, 38:18-39:35). Nevertheless, after recounting that story and upon being asked by the researchers what might be involved in his "actually applying" CFT to his teaching in future situations, Mr. R invoked a cognitively flexible attitude for *himself as a teacher* by pointing out that "one size does not fit all" (PD6, 38:18-39:35). Put another way, when (as mentioned earlier) he envisioned using CFT as "a 'tool in the toolbox' kind of thing" to promote "deeper thinking" in ways directed by whatever a given situation called for (e.g., "this is where I want them to think about the different perspectives involved"), it indicated that exposure to CFT may have begun to instill an *adaptive teaching mindset* in Mr. R, one that included being "open" to how CFT itself might be complementary to his existing pedagogy in the future (PD6, 38:18-40:35).

CHAPTER 4: GENERAL DISCUSSION

4.1: Overall Findings

For the purpose of addressing the primary question of what might be required to develop and empirically test a translation framework aimed at helping teachers and researchers attain a bidirectional "meeting of the minds" to foster more meaningful translation of academic learning theories into pedagogical practice, several key takeaways can be summarized (and will be further elaborated below) from this study's findings pertaining to how the collaboration between Mr. R and the CFT/LICRA researchers unfolded. First, even as the researchers emphasized the need to help students develop ways of thinking about ill-structured topics that embrace complexity and the teacher was transparent about his uncertainty about being able to promote such learning outcomes within his teaching "reality", their initial mindsets reflected their appreciation from the beginning of the need to approach their interactions with each other with a mutually supportive attitude, an attitude centered on giving due acknowledgement and care towards what Mr. R's "operating context" *was* and not just how *they would like it to be* (PD1, 20:58-22:05). Second, whether it was attributed to apathy, a "conspiracy of convenience" (PD2, 47:26-47:44), or a desire to avoid potential conflict with parental figures, school administrators and/or policymakers, the collaborators expressed a mutually shared displeasure towards K-12 schools' tendency (e.g., via overreliance on standardized testing) to promote an understanding of U.S. History that is far too superficial or reductive in nature, one that they envisioned would leave students' like Mr. R's ill-equipped to attain employment or navigate daily life in the future. Third, as conversations unfolded regarding how learning theories like CFT might be translated into practice, the researchers came to defer to what Mr. R shared about how to navigate his teaching "reality", including (a) how he accounted for his students' life experiences, motivations and stage of cognitive development, (b) his previous attempts to insert "little wrinkles of complexity" into his curriculum (PD2, 44:56-45:54), and (c) the current state of assessments within his classroom setting and what that indicated about the sorts of learning outcomes (e.g., patterns of thinking) that could eventually be promoted there. Finally, following Mr. R's recounting of the "freedom" exercises he designed and implemented following his exposure to CFT/LICRA during the planning discussions, the researchers praised the emergence of a "two-stage theory of feedback" that added a new dimension to the CFT and the teacher himself acknowledged his growing comfort with using the learning theory as a "tool in (his) toolbox" for instructional use (PD6, 28:01-36:29; PD6, 36:31-40:35) – thereby offering preliminary credence to the sentiment that intersecting new learning theories with pedagogical expertise can be both enlightening for academic scholars and empowering for teachers.

4.1.1. Sub-Question 1: What were the initial mindsets of the 9th-grade U.S. History teacher and CFT/LICRA researchers entering the collaboration, particularly in relation to its central goal of facilitating the teacher's efforts to incorporate CFT/LICRA principles into his classroom instruction?

As mentioned previously, precedent scholarship (e.g., Wenger, 1999) has recognized that when academic scholars and practitioners are aiming to develop collaborative communities of practices, such endeavors are greatly facilitated when steps are proactively taken to ensure that their shared space promotes "mutual engagement" and proper recognition (and validation) of each party's "complementary competences" even when they might not see or approach the same situation in the exact same way (pp. 73-74, 76-77). And from the beginning, the researchers seemed keenly aware of this necessity, acknowledging that their being "pretty ignorant about a lot of classroom realities" could significantly hinder any efforts to meaningfully translate CFT/LICRA into Mr. R's classroom setting unless proper steps were taken within the collaboration from the outset (PD1, 13:59-14:07). And thus, in terms of what their initial goals and expectations were, they did not want to fall into the trap of "trying to do an intervention" within Mr. R's classroom in a predetermined manner, nor did they expect anyone in the collaboration to "have a fully formed epistemology" (PD1, 9:51-9:57, 14:07-14:12). Rather, by extoling the need for "studying one step back" and focusing on what could be done to better understand "the process of teacher and researchers talking together, working together" *as a primary research goal* (PD1, 9:22-9:59), the CFT Expert and PI embodied a more learning-oriented and deferential initial mindset towards whatever the teacher had to share. This is not to say that they did not share their own viewpoints regarding what academic theories like CFT suggest about students' ability to display a "flexible response to new situations" and the relevance of such cognition for their ability to "get a job within a few years" (PD1, 41:12-41:57); rather, they appeared to convey the notion from the outset that research examining how education must evolve as "the world changes (and) new purposes of learning come along" should seek to uplift teacher voice as a foundational principle and not as a mere afterthought (PD1, 9:10-9:18).

As for the teacher, even as the researchers strove to ascertain the degree to which Mr. R might be "sympathetic to some of the ideas" from academia they hoped to share with him (PD1, 10:11-10:19), he did not seem to have much to comment on or ask beforehand regarding his initial goals and expectations. In fact, when directly asked about what "logistical considerations" might be crucial in order to make the collaboration fit both what "(his) classroom and what (the PI's) dissertation needs", he expressed the sentiment that "I guess we'll get to it when we get to it" (PD1, 12:39-13:12). That being said, it did not take long for his initial mindset to shine through. In particular, Mr. R was very clear in his preexisting belief that true knowledge consists of not only having an awareness of both "facts" and "the things that are also not facts", but also having the capacity to "unpack and repack" information for "different

audiences" in different ways even if they reflect "the same ideas" (PD1, 15:47-16:47). And indeed, his noting elsewhere that such understanding should be "deeper than just knowing…that December 7th is the day that Pearl Harbor was bombed" appeared to imply that he held such a standard when evaluating anything that he himself might consider for the purpose of introducing historical topics (as well as what might be needed for specific student cohorts) (PD1, 16:38-16:46). But beyond this, he situated his initial mindset less in the merits of particular academic theories and more around what might logistically be feasible within his current professional capacity. Namely, by noting (a) his ongoing struggle to discuss concepts in "in any length" or with "any depth" due to the "pace of the class and…'standards'" he had to meet "within a certain timeframe"; and (b) the job of teaching being significantly harder for him at the time of this study than "20 years ago", his attitude reflected a certain degree of learned pessimism centered around what *could* unfold as a result of the collaboration rather than what he *wished* to see unfold (PD1, 18:35-20:58). But encouragingly, the CFT Expert immediately put in the effort to both respect the nature of Mr. R "operating context" (i.e., "limitations of time", the type of "material" needing to be covered, and students' "entering knowledge") and attest that "over time, being able to get at a little bit more depth" would be sufficient for the purposes of the collaboration (PD1, 20:58-22:05). While more remains to be asked to the CFT Expert regarding the challenges he initially anticipated for "repacking" CFT with Mr. R's student "audience" in mind, one can only imagine how many teachers like Mr. R in the past have brushed off education researchers' attempts to collaborate with them due to those researchers not following the CFT Expert's lead in giving due regard for the "larger contexts" and "specific resources and constraints" that said teachers must regularly navigate (Wenger, 1999, p. 79).

Regarding mutual understandings that the teacher and researchers initially discovered between their perspectives, it did not take long for them to find several points of alignment regarding how they felt history should be taught in K-12 classrooms with the principles underpinning CFT/LICRA in mind. To begin, Mr. R acknowledged that any opportunity to use "examples" that were "scattered throughout our textbook" to bring "concepts, ideas, paradigms" to life were "like candy" to him as an educator, and the CFT Expert's recognized such efforts in "connecting up…something that happens here with something there" rather than separating them "into separate chapters, silos, compartments" as embodying the sort of "adaptive, improvisational performance" that CFT calls for when acquiring knowledge from ISDs (PD1, 18:35-23:05; 28:51-28:58). And second, while it was not fully explored what might be entailed in transferring such knowledge acquisition during Mr. R's lessons to promote the sort "novel problem solving" that his students might need to "deal with the pandemic" or professionally thrive in the future (PD1, 41:21-41:51), they appeared to agree that it entailed not only finding connections between knowledge but also "understanding enough to know where (they) can go to get more information" to deepen said understanding even further (PD1, 30:08-30:46). In that sense, Mr. R's anecdotes appeared to

reflect a willingness to both "see the repetitive nature of everything that happens" (e.g., Harding's vs. Trump's scandals) and "look below the surface" to note "subtlety of difference" between different historical events (e.g., media's depictions of WWI vs. war in Afghanistan), with the CFT Expert all-too-eager to note as a "real meeting ground" that is also "crucial in CFT…pure CFT" (PD1, 35:54-36:05).

But even as the collaborators were aligned in their shared belief regarding the need to look for meaningful connections and "be on guard for the new, in addition to repeating patterns" across different historical events as a "epistemic principle" (PD5, 40:02-40:10), Mr. R was open from early on in saying it would be a "real uphill climb" to ask his ninth graders to "suddenly turn into students" again, particularly given the impact of the pandemic on their ability to "be with their peers,…use a computer to study,…(or) just how to be people" (PD2, 1:10:25-1:11:09). Beyond this, Mr. R himself admitted to feeling "kind of stuck in the mundane kind of classroom kind of thing" given the aforementioned professional expectations placed upon him (PD1, 19:00-19:06). As a result, in hopes of making the collaboration feel more manageable, the researchers' chose to change course by introducing "catchphrases" to Mr. R as "helpful little reminders" or "shorthand" for meaningful facets or "lenses" of CFT (i.e., via a single PowerPoint slide), as opposed to their original idea of providing seminal articles pertaining to the learning theory for him to read outside the planning discussions (PD3, 4:37-6:12). As it did for the researchers, this development calls for caution when promoting a "cognitive ethos for opening up (one's learning) …for going deeper" (PD4, 46:02-46:17), lest one risk cognitively overwhelming the students in a given K-12 classroom or even the teachers instructing them (Spiro, et al., 1992). And indeed, accounting for this can be as simple as finding less complicated ways to explain academic theories like CFT, in order to make them feel more digestible to K-12 practitioners and thus more appealing for them to implement.

Such a consideration strongly altered the trajectory of how the collaboration itself unfolded – not only in terms of opening the door for new "catchphrases" following insights from the teacher ("Think Multiple Instead of Single!", "Don't Think in Black and White!"), but also in the increased ownership that Mr. R himself began to exhibit *as a teacher* to translate CFT *with his classroom setting in mind*. More specifically, during conversations focused on what might facilitate a "marriage" between Mr. R's teaching "values" and CFT-oriented "ways of thinking" as represented by the catchphrases (PD3, 4:37-6:12), he noted the difficulty of trying to "integrate into *what my own jargon* is that I use in the classroom" (PD5, 14:46-14:53). In other words, Mr. R made it a point that if the researchers wished to try "putting 'ivory tower', in the clouds, academic ideas into practice" (PD5, 33:34-33:54), there was a need for them to consider what might be entailed in not just reframing theories like CFT in "non-technical" and "jargon-free" language (Spiro, et al., 2019, p. 963), but actually ascertaining how it might be best presented *using what feels most natural to the collaborating teacher or practitioner themself*! And fortunately, Mr. R felt comfortable sharing how CFT might be presented in his classroom in several

ways, including offering analogies (e.g., citing Heraclitus's expression that "you can't put your foot in the same river twice" for "Cases Comes First!"; PD2, 49:27-49:43), providing direct "translations" invoking "nuanced interpretations of (language) I recollect having used" (Appendix R), and describing how his actions could embody CFT-oriented thinking as well (e.g., using the Web "as an extension of the mind, rather than a substitute for thinking" to "enrich what's being learned" during lessons; PD4, 25:07-27:32). And in doing so, from the outset, Mr. R highlighted a key takeaway for the CFT Expert and PI to heed for collaborations with him and CFT/LICRA research elsewhere. Namely, akin to Michigan's Department of Education (2019) emphasis on the need for high schoolers to (among other skills) learn how to share their knowledge and opinions "for a variety of purposes and audiences" (p. 86), if education researchers truly wish to facilitate K-12 teachers' efforts to incorporate ideas from academia into their classrooms, then they must be prepared to do the work and display the humility needed to make those ideas suitable for the perspectives, language and needs held by the "audience" navigating each unique learning environment.

4.1.2. Sub-Question 2: Across the collaboration, what discrepancies were identified and discussed by the collaborators between how they felt U.S. History should be taught in K-12 classroom settings (i.e., in relation to CFT/LICRA) and the ways that U.S. History is "traditionally" taught in today's society (including within the teacher's high school)?

If readers want an encapsulation of the discrepancies discussed by the collaborators between how U.S. History should be taught and how they saw the subject being typically taught in K-12 schools, they need only observe the stark alignment between Mr. R's gravitation to CFT's focus on "how the world is, contrary to how you're asked to teach about the world" and the CFT Expert's praise of Mr. R's disgust at having to "teach for some test" as "a perfect characterization of CFT('s)…goals" (PD1, 1:18:29-1:19:01). With that in mind, whether they were lamenting Mr. R's school administration going in "the opposite direction" that they should be, the expectations of standardized testing like MEAP, or the effects of policies implemented by entities like Reagan's National Commission of Excellence (PD1, 48:44-48:51; 1:12:25-1:13:46; 1:19:30-1:19:45), the sentiment expressed by the collaborators was both mutual and clear. Namely, they did not merely believe less-than-ideal differences exist; rather, they expressed their view that K-12 teachers are being told to instruct their students in *the worst possible manner* – at least if schools care about avoiding "an epidemic of disengaged students who don't care" and who are ultimately unable to apply historical knowledge in any meaningful way beyond answering "the questions on (a) test" (PD1, 1:12:25-1:14:52). But it went even further than disapproving the current state of affairs, for even as Mr. R declared that he "hate(d) everything about" how such a pedagogical climate has emerged over the course of his teaching career (PD1, 1:13:16-1:13:18), the CFT Expert acknowledged that the issue is nothing new in academia either by noting how he used an "in-politic moment early in (his) career" to point out the "the conspiracy of convenience in education" (PD2, 47:26-47:44). From there, as he

lamented the construction of an artificially "simple reality" embraced by "textbook writers…test makers…(and) students" due to it being "easier" to learn about and evaluate, Mr. R coined an apt phrase to represent the mentality – "Buy a book, solve it" (PD2, 47:44-52:36). Thus, their shared notion evolved into a moral repudiation of sorts, namely towards the various stakeholders in education who seemed to *know that U.S. History instruction in K-12 schools is woefully inadequate but do not seem to care*.

With this in mind, their ensuing discussions for how Mr. R might navigate his classroom with CFT/LICRA in mind began to carry a tone of what could be done *in spite* of the professional conditions he was working under, whether that entailed dissecting what Mr. R might cover in his lessons (e.g., using "intermediate cases…that aren't so clear cut"; PD6, 47:24-48:11) or exploring how he might teach within the confines of the expectations and resources allocated to him (e.g., teacher casebooks' tendency to provide "nice, orderly" guidelines that go "out the window once you start teaching"; PD2, 47:46-48:50). And for that purpose, two central tenets seemed to take top priority in relation to combatting such a "conspiracy of convenience". First, when exploring "where…epistemologies intersect(ed)", there was a shared desire to regard history *in principle* as "a fucking mess", a subject well-suited for CFT's recommendations given its relevance for learning "'messy, real world' domains" (PD1, 1:01:38-1:02:06). And second, when thinking about Mr. R's students and "chang(ing) the way they think", while there was a mutual understanding of it being "hard to change any habits (of mind)" with any single intervention or learning activity, taking steps to "get a wedge in" to think in slightly more "open" ways had merits for simply being part of the solution instead of just asking them to find "the right answer for the test" (PD6, 15:13-16:26). Thus, the collaborators' dialogue consistently wavered between being idealistic (i.e., discussing what CFT calls for) and being realistic (i.e., ascertaining the state of Mr. R's school climate), including when trying to get on the same page during meaning making of historical concepts or ideas. For example, when Mr. R expressed concerns about his "audience" of 13-14-year-old students being "very concrete thinkers", the ensuing discussion both explored why such a mindset actually qualifies within a CFT framework as "starting in the right place" (i.e., due to indicating an awareness of the world being "messy") and K-12 schools' complicity in responding to such cognition poorly (i.e., due to their proceeding to "knock it out of them by giving 'em all the multiple-choice tests") (PD1, 1:02:06-1:04:26).

It is worth noting that some facets of the collaborators' rationale were not fully explored during the planning discussions themselves, such as what made Mr. R initially associate being a "concrete" thinker in a negative way with holding a "black and white" learning mindset (PD1, 1:02:06-1:02:19). Nevertheless, given their tendency to bounce back and forth between the theoretical and the pragmatic, it is perhaps fitting that their dialogue about how to combat the state of "traditional" U.S. History education in K-12 classrooms eventually converged towards brainstorming what could be done to help Mr. R's students "open things up" and avoid the temptation to "spare (themselves) the trouble of thinking" given

the resources Mr. R had to work with and the teaching conditions he had to navigate (PD2, 1:28:37-1:29:37). On the one hand, such pedagogical reflections seemed to home in on what was *within* Mr. R's control. Sometimes this involved nuanced evaluation of Mr. R's instruction (e.g., his self-identified need to write clearer prompts for activities like his "ungraded" "Call to Freedom" exercise if he wished to encourage students to "try to spend their time" mainly on the Web; PD5, 18:24-18:38; 19:27-19:32); and other times, it involved an honest assessment of which logistical considerations might be necessary (e.g., the unlikelihood of running the CFT Expert's proposed four-part, "kind of CFT-ish" Web exercise in "the last few days of the semester" due to all the "preparation" required (PD5, 22:00-22:10; 27:28-28:00). And indeed, such constructive dialogue indicated a certain degree of vulnerability and comfort between the teacher and researchers that could be attributed to their ongoing efforts to identify and collectively pursue shared goals aimed at "better educational experiences for all" (Ulichny & Schoener, 1996, pp. 502-503) – namely, their desire to help Mr. R's students have more chances to experience "lightbulb, 'a-ha" moments and/or "conceptual epiphanies" related to their thinking more deeply (PD5, 26:10-26:33).

On the other hand, such frank discussions about the current state of U.S. History instruction (both in Mr. R's school context and on a wider scale) did not avoid acknowledging noteworthy factors that were *beyond* Mr. R's control, for they seemed quite cognizant of the possibility that promoting a more "open" mindset towards learning about and considering others' perspectives (including marginalized ones) might not be positively received by others in Mr. R's school community, particularly for topics that might be considered "hot-button" in today's "controversial political climate" (PD3, 14:17-14:22; 23:51-23:59). Indeed, the CFT Expert's respect and concern for Mr. R shone through as he expressed his fear at "the fucking right (being) ready to pounce" and the teacher potentially being made "an example of" should his lectures be perceived by parents or his school board as "anti-white and…communist" (PD3, 27:00-27:58). And notably, even as Mr. R expressed his readiness to "retire" if that was the cost of "teach(ing) the truth", the CFT Expert seemed keen to (a) point out the potential to use CFT and complexity as a "cover" to "have your cake and eat it, to tell the truth and have your job too"; and (b) explicitly indicate his willingness to support him through "letters to the school board explaining why what you were doing was good history" or "letters of reference" should it come to that (PD3, 29:49-31:05). Through interactions like this, the collaborators displayed a readiness to invest in and make sacrifices for each other on a public and professional scale; and while it was of course hoped that such steps would not be necessary, it offered further empirical support for the notion that in successful teacher-researcher "joint enterprise(s)", building of "strong relational trust" and a sense of "collective responsibility" for the learning outcomes being pursued tend to go hand in hand (Wenger, 1999, 77, 79; Kahlenberg and Potter, 2014, para. 4-5).

4.1.3. Sub-Question 3: What considerations or concerns were raised by the collaborators when discussing how to incorporate CFT/LICRA principles within the "constraints" of the teacher's "reality"?

As might be expected given the rationale underpinning this study, in order to adequately play their respective roles in the "joint enterprise" of introducing CFT/LICRA principles into Mr. R's classroom, the collaborators were keenly aware of the need to frame any dialogue regarding how to help Mr. R's students "somehow think about things differently" around what was doable for him "given the constraints" he was "operating under" within his pedagogical "reality" (PD1, 45:46-51:15; PD2, 50:54-52:10). From the researchers' perspective, what a better way to uplift teacher voice to begin tackling that consideration than by directly asking the teacher what noteworthy "constraints" stood out most to him? And indeed, alongside the aforementioned systemic, schoolwide and societal concerns previously mentioned, multiple key factors were brought forth. On the one hand, focus seemed to be placed on *what considerations should be made for Mr. R's students given their life experience*. In particular, when Mr. R noted his need to keep things "pretty simple" for his ninth graders, he cast blame for that necessity on the habits of thinking "drilled" into them by the standardized testing that K-12 teachers' instruction (and, in turn, his students' study habits) had to adhere to (PD2, 32:30-33:12) – which appeared to align strongly with the CFT's Expert's prior condemnation of schools' tendency to mishandle "adaptability" when displayed by students despite it enabling humanity's ability to "evolve and survive" over "hundreds of thousands of years" under complex, unpredictable and often hostile conditions (PD1, 1:02:19-1:04:26). On the other hand, even under ideal teaching conditions that might duly consider "where CFT could go" (e.g., having students explore "rooms" in "different order(s)" during Mr. R's "museum" activity; PD2, 10:44-12:51), it was acknowledged by the collaborators that they would need to *make considerations for Mr. R's students given their nature as a younger "audience"*, lest they risk overwhelming those students (i.e., due to incurring excessive cognitive load) in a manner diametrically opposed to both Mr. R's overt warnings and precedent CFT/LICRA scholarship (Spiro, et al., 1992; DeSchryver & Spiro, 2008).

As a result of these concerns, the researchers proceeded to forego any proclivity of theirs for "the way (the PI) taught doctoral students in his practicum" or however they might be inclined to examine the learning impact of CFT/LICRA under laboratory conditions (PD4, 54:11-55:16). Rather, they took the stance that any successful "translation, communication, and so on" within Mr. R's "constraints" would depend on heeding whatever wisdom might arise from Mr. R's "experience (and) knowledge of the kids", as well as from his instincts as "the expert teacher" within his "milieu" (PD4, 56:12-57:28). For this aim, one consideration that showed promise involved building upon pedagogical strategies *"already in (Mr. R's) teaching" before the collaboration*, particularly if Mr. R previously used them as "little wedge

points" to add "little wrinkles of complexity" to his lessons (PD2, 37:29-38:35; 44:56-45:54). And such wrinkles were found across a variety of pedagogical situations anecdotally described by Mr. R, including:

a. using mnemonic devices (e.g., M-A-I-N) to emphasize multiple causation and there often not being a "single right answer" for what caused a given historical event (PD3, 6:14-7:15);
b. noting examples of "kind of similar, kind of different" to break students from "traditional 'right/wrong'…black and white, dichotomous, either/or" mindsets, such as comparing media use of "Going Down the Road Feeling Bad" in "The Grapes of Wrath" (i.e., "in the Great Depression") vs. John Mayer's performance (PD2, 1:14:58-1:15:54; 1:16:57-1:19:34); and
c. providing "great examples" (e.g., "Who's responsible for Setsuko's death?") to highlight the existence of "multiple perspectives… (and) different ways to see things" (PD3, 10:09-15:20).

Across Mr. R's recounting of all these efforts to help students take "perfect, small, incremental steps" to "deepen" their learning and better navigate the "messy world" (PD2, 41:02-41:46), an intriguing trend was noticeable in what he shared: *none of his strategies seemed to alter his assigned U.S. History curriculum on a substantive level*. Rather, Mr. R appeared to be focused on navigating his "constraints" by trying to incorporate different ways of thinking or reflecting upon the topics he would have to cover anyway, in a manner that seemed to both build upon his approach toward each student as "completely new, novel and complete and complex" and incorporate such a "anti-essentialist, anti-typologist, anti-Platonist" outlook to encourage his students to build a sense of empathy or "emotional connection" with historical figures or perspectives they learned about (PD1, 58:19-59:40; PD4, 16:22-18:48). Put another way, rather than shying away from the "reality" of topics he had to discuss in class, Mr. R called the researchers' attention to his keenness for not presented said topics in too "simple" a way or with certain perceptions of (or viewpoints about) that "reality" intentionally overlooked or marginalized; and in doing so, *he made evident his comfort with using complexity as a cover even pre-collaboration*, just as the CFT Expert recommended he do when integrating CFT/LICRA itself within his classroom setting! In this way, even if strategies Mr. R mentioned using have also been used by others (e.g., M-A-I-N; Browne, 2021), what mattered most for the aims of this collaboration was his prior application of a teaching style that further indicated, *by praxis*, his natural pedagogical compatibility with CFT as a learning theory.

But on the other hand, some energy was also spent responding to Mr. R's display of pessimism related to introducing "little wrinkles of complexity" within the "constraints" of his classroom – or, in other words, considering why he at times appeared to regard efforts to identify "actual pedagogy", for the purpose of deepening his students' learning in an evidence-based and "practical" way, as potentially futile (PD6, 28:01-28:40). After all, Mr. R had expressed the sentiment that the "constant pressure to get

standardized, to adhere to the standards, to follow the standards, to test the standards and make sure that your assessments match the standards", as well as seeing colleagues opposed to such a trend get "pushed out" , had left him feeling like there was "no room…(to) try to get (his students) to think about things differently" beyond trying to "show them a film perhaps" or something similar (PD1, 45:46-49:50). It was interesting to see the CFT Expert's immediate response focus more on emotional reassurance than anything else. Indeed, in both praising Mr. R's efforts as a "perfect example" of how to help students "achieve some other learning goals" beyond high standardized test scores and expressing his belief in "a future" where "big corporations" and those who "influence the state school districts" would be "forced" to acknowledge the need to shift their priorities for K-12 education (PD1, 49:50-53:02), the CFT Expert appeared to be trying to convince the teacher that there was merit in at least exploring how "21st century skill goals, deeper learning goals", one that do not shy away from "the real world and mess", could potentially be assessed within his current teaching "constraints" (PD1, 51:15-53:02; 1:01:38-1:02:06). And with such rationale, they proceeded to do so from multiple angles. First, they lamented how *current assessments* like MEAP ask students to complete tasks like "writ(ing) a letter to the editor using…three core democratic values", largely due to their promoting erroneous assumptions about there being a "right way" (i.e., the right "two-sentence definition") to demonstrate an understanding of historical concepts that "in reality" can be defined and "used in lots of different ways" (PD1, 1:19:36-1:20-39; PD3, 58:23-59:20). And second, they thought about *hypothetical assessments* that might need to be incorporated by K-12 schools to remain relevant as educational institutions in the future. In particular, they homed in on Mr. R's sense of CFT being "very Oriental…very Zen" in order to reflect on the need for students to learn how to better eschew their "conceptual blinders" – namely, by not looking for one-size-fits-all, "singular sort(s) of 'right answers'" to rigidly fit into "plaster-cast boxes", and instead using their knowledge flexibly for whatever is "novel, special and unique about (a) particular situation" (PD5, 40:18-43:05). Put together, they came to mutually agree that any assessments promoting "deeper learning goals" aligned with CFT would likely be diametrically opposed to what K-12 assessments currently tend to prioritize.

With that in mind, the collaborators' attention was increasingly given to considering what integrating projects involving CFT/LICRA into Mr. R's classroom might entail, as well as which resources (or lack thereof) and logistics might be relevant for their integration into his teaching "reality". As specific anecdotes brought forth by Mr. R (e.g., his sharing Whitney Houston's rendition of the Star-Spangled Banner and the "emotional reaction" that ensued) highlighted ways that he previously utilized "variation within similarity" and other complexities discoverable across U.S. History to put his students' knowledge to the "real. world. test." (PD4, 50:27-53:07; PD6, 30:19-31:59), focus seemed to drift towards how a "longitudinal" approach (as originally termed by Mr. R) might be developed to "add to" the "fantastic, great, way better than most kids get" pedagogical approach that the teacher already had in

place (PD2, 12:51-14:55). And over time, possibly in the spirit of distinguishing the collaboration further from current policymakers, the CFT Expert began to postulate that their integration of CFT/LICRA should focus more on creating "baby steps" for "incremental(ly) open(ing) up" students' thinking and attitude towards U.S. History (e.g., helping them see the subject as "complex and interesting"), rather than on helping them "answer the standardized test questions" better (PD2, 17:12-17:50; 33:27-35:11; 1:26:45-1:27:55). In this sense, from a cognitive theorist standpoint, rather than worrying about assessing Mr. R's students' scores on a given exam or assignment, the researchers seemed most excited by the prospect of seeing if they undergo a "mindset change" from wanting to know the "right answers" to wanting to learn more deeply for the sake of attaining a true understanding of history (PD3, 17:05-18:45). But even more broadly, the collaborators appeared to be mentally situated to find value in any sort of "incremental" shift that might emerge from their initial attempts to "let loose" the CFT "animal" in Mr. R's "reality", likely a byproduct of their appreciating both the exploratory nature of this study's planning discussions and the degree to which they would likely be limited moving forward in the sorts of alterations they might be able to realistically enact in Mr. R's classroom or other "traditional schooling" contexts (PD6, 18:05-21:08).

4.1.4. Sub-Question 4: How did the collaboration evolve over time, particularly in response to insights reported by the teacher in relation to his initial efforts to incorporate CFT/LICRA principles into his classroom instruction (i.e., as reported to the researchers during the planning discussions)?

As a starting place when examining how the collaboration responded to Mr. R's initial efforts to integrate CFT/LICRA, just as the researchers' primary focus was more on impacting "mindset change" than on academic performance alone, Mr. R firmly espoused that "no significant learning happens without a significant relationship" being established (PD1, 58:19-59:28). On the one hand, such a consideration was centered on the need to proactively respond to events that might impact Mr. R's students on an *individual* level (e.g., a cafeteria worker and student fighting over the "n-word"; PD4, 14:04-14:39), particularly in light of his students' demographics "not overwhelmingly (being) a white majority" and thus some of them being more vulnerable or "hypersensitive" to instances of systemic injustice, within Mr. R's school setting and more broadly, than others (PD3, 28:23-29:49; PD4, 13:06-14:04). And as disheartening as it was to hear that Mr. R had to set time aside to "negotiate not saying the "n-word" and other hateful language with his students for certain historical topics, taking such precautions was clearly a high priority for him during his lessons (as well as for any undertakings with the researchers) from both an instructional and relational standpoint (PD4, 14:04-14:39). Indeed, even as Mr. R did not deny the possibility that parents disagreeing with his teaching approach might use "school board meetings" to force him into an earlier-than-planned "retirement" (PD3, 27:00-28:11), it appeared that the possibility of losing "attention and respect" from his marginalized students (and condoning the "white majority"

remaining unaware of "the truth" from American history) offended his sensibilities on a professional and ethical level on a far deeper level (PD3, 28:23-29:49). And on the other hand, as much as Mr. R's "anti-Platonist" approach in relation to his students' individuality resonated deeply with the researchers, it was also deemed critical to acknowledge what might be affecting their learning on a collective or *group* level. In particular, Mr. R decried his students' widespread "froggy" behavior to both COVID-19 and schools' fixation on students meeting "particular standards" rather than becoming "independent, critical thinkers"– thereby assigning responsibility for his students' less "student-like behavior" on not only unprecedented circumstances beyond his school's control, but also on long-standing institutional failure that he perceived as being very much in their control (PD3, 48:47-49:52; PD1, 41:57-42:52). Interestingly, possibly building upon "terrain (he has had) to operate on a lot" as an academic scholar (PD1, 43:51-44:00), the researchers suggested that "emphasiz(ing) more…students in front who are thinking", those "at least paying attention and trying", would be a better use of the collaboration's time and energy than fully documenting Mr. R's full "spectrum" of students regardless of level of engagement (PD2, 58:15-1:03:08). And one could argue that in this situation, the CFT Expert and PI were overtly taking a cue from the sort of "anti-Platonist" approach to teaching directly inspired by Mr. R's preexisting pedagogical approach.

It must be acknowledged that further discussion needs to take place to ascertain the degree to which Mr. R might perceive such "froggy" behavior as temporary or what behavior indicators might indicate the "better kids" from within his classroom setting who would "really benefit from…feedback" (PD1, 20:02-20:58; PD3, 52:39-53:48). Nevertheless, such considerations about Mr. R's students did pave the way for the collaborators to thereafter respond to Mr. R's recounting of his initial attempts to use CFT/LICRA to "get the hook set in deep enough" to encourage their deeper thinking (PD6, 20:22-21:38). In particular, despite being limited by the inability of this study to obtain identifiable student data and the planning discussions largely taking around "the end of the (school) year" (PD5, 29:08-29:26), Mr. R reported some intriguing "glimmers" of deep thinking that arose during his "ungraded" exercise involving the title of his class's textbook ("Call to Freedom") (PD5, 18:04-20:14; 29:27-30:29). And as the collaborators discussed those students who seemed to "think more deeply" about the assignment (PD5, 54:31-56:05), it was intriguing to witness the level of enthusiasm they displayed for responses as seemingly common sense as acknowledging that "freedom" might be thought of differently by people from different backgrounds (e.g., those who are "rich, white, a man, cisgender, heterosexual, or able-bodied" vs. those who are not), or that the concept might be understood differently in "different contexts" (e.g., "immigrants from Mexico" vs. those involved in "protests and revolutions") (PD5, 56:05-58:03). But if one combines the CFT Expert's sentiment that mere exposure to "different senses of 'freedom'" than their own might make students' "heads explode a little bit" with his notion that anything like Mr. R's "Call to Freedom" exercise could be banned if "somebody like Ron DeSantis becomes our governor", a

bleaker undercurrent emerges from those particular interactions (PD4, 19:45-20:27; PD5, 56:48-57:37). Specifically, even as Mr. R expressed grief earlier in the collaboration about what he *could not* do to help his students more deeply understand U.S. History, in light of these responses, the CFT Expert seemed to anticipate that some in positions of power *might not want them* to attain such a deeper understanding.

Nevertheless, such responses to the "Call to Freedom" exercise fostered some optimism that pedagogical strategies could be feasibly implemented, even within the constraints of Mr. R's current teaching "reality", to help his students gain deeper "insights into meaning that they didn't have" that could thereafter promote a more fundamental mindset change towards learning U.S. History (PD5, 58:03-59:04). Thus, once it was revealed that Mr. R had a "summative" learning activity for the purpose of encouraging "deep and open searching and learning on the Web" in a LICRA-like manner "already wrapped up" and "in (his) mind" as one of his class's last exercises for the school year (PD4, 18:48-20:27), the collaboration naturally shifted to seeing how what steps he took to build off what he "had talked about" with the researchers across the planning discussions (PD6, 4:32-5:13). While it should be acknowledged that half as many students responded to the follow-up task compared to the "Call to Freedom" exercise (due to the fact that it was "still an ungraded assignment" and the specific wording of that task's prompt was not explicitly shared with the researchers by Mr. R, promising trends still emerged regarding not only the nature of his students' submissions, but also what they indicated to his regarding strategies he could use to ensure that they "really benefit from…feedback" (PD6, 21:26-21:38). Regarding the first category of insights, in a manner that implied upon Mr. R's curriculum spanning from "the Second Industrial Revolution until just before 9/11" (PD2, 1:24:00-1:24:32), his students collectively displayed an ability to apply knowledge that (a) has a "*direct link* with our curriculum" (e.g., freedom to vote, freedom of expression, freedom to protest; freedom of religion; PD6, 8:58-11:02); (b) indicates the discovery of "something online" *beyond* the curriculum due to mentioning historical events not covered in Mr. R's lessons (e.g., "the Arab Spring" and the impact of "shutting Internet communication down" on "freedom of speech" or "control of the truth"; PD6, 5:13-8:01); and even (c) entirely new understandings of the concept of freedom beyond Mr. R's expectations of "where everybody could go" (e.g., "freedom from homelessness", which was noted as an engagement with "'liberal safety net' thinking"; PD6; 13:38-15:13). That said, as evidenced by the student who wrote down "freedom from taxation" (PD8, 9:54-10:52), the exercise was also capable of identifying students whose knowledge could be deepened or was in need of correction. Thus, through these responses, evidence was not only found for Mr. R's students' having the *capacity* to incorporate a "different way of thinking" about complex concepts or events beyond the "right" understandings often reductively put forth by standardized testing or textbooks (PD6, 15:13-16:26). Beyond this, by successfully identifying students situated to receive both positive reinforcement and corrective guidance, the follow-up exercise demonstrated how Mr. R could utilize CFT/LICRA as an

instructional tool to support *all his students at once regardless of their performance level*, so long as the appropriate "second step(s)" could be identified to "open up (their) thinking" further (PD4, 12:09-13:38).

On a classwide level, a "second step" proposed for providing exposure to others' perspectives on the concept of freedom, "all freedom but all different", involved "bring(ing) the class together on and talk about the different perspectives on freedom" they reported that were all "right" to a certain degree (PD4, 11:08-12:09). And interestingly, alongside having an educative propose (i.e., discouraging students from being too "narrow in (their) denotative, definitional sense of concepts" by overtly showing them firsthand the existence of multiple valid ways of understanding them), one could argue that there was an element of empowerment in Mr. R's emphasis on wanting students to "use their own responses" (PD4, 12:09-14:38). More specifically, while Mr. R's thoughts need to be further ascertained regarding *why* there might be limited alignment between the notion(s) of "freedom" his students gravitated to and the notions "directly or indirectly" prioritized by his class textbook, as well as what it might entail to formally incorporate such "diverse viewpoints" to further "open up…thinking" into his lesson plans (PD6, 8:01-8:58; 11:08-12:09), his outlook harkened back to his emphasis on the need to recognize his students as being "complete and complex" in order to facilitate "significant relationship" building. Namely, by being receptive to using certain classroom activities to duly account for and validate notions of freedom "internalized" and made "personal" by his students *before* entering his classroom even if they are not highlighted by his textbook (e.g., the freedom to be "whatever it is that you wanna be" without "social constraints"), Mr. R displayed a readiness to encourage *by example* the merits of being "open" when encountering others who see things differently, including when such perspectives are brought forth by his own students (PD6, 5:15-8:01).

And on a more individualized level, building upon Mr. R's notion that teachers would likely need to "attach a grade" and "provide feedback" to encourage or discourage specific student behaviors, the researchers encouraged any opportunity to base grading on the "values" promoted by "the catchphrases", including avoiding the temptation to search for "the single right answer" and recognizing the existence of "different possible solutions to…complex historical problem(s)" (PD6, 20:22-24:59). It is not to say that the collaborators did not acknowledge the need for students today to show their understanding in ways still being asked for by their textbook and existing standards (e.g., in a manner "organized into chapters", as if "the world…(goes) in a line"); rather, they saw a "new theory" for developing "CFT-based, practical, in-the-classroom feedback" as capable of going *one step further* by helping students also begin to think and apply their knowledge "in this way that the world goes" (PD6, 23:02-24:59; 34:45-35:49). With this in mind, Mr. R proposed using a feedback "loop" to "add to the grade that (his students) already established", namely by "continually feed(ing) them little things" to directly "build on" the thinking denoted in their "initial response(s)"; and in doing so, he anticipated being able to "broaden their horizons" by tailoring his introduction of CFT on gaps in deeper thinking displayed by his students on an

evolving, case-by-case basis (PD6, 24:59-28:01). In other words, he envisioned a pedagogical mindset that entailed being *situationally adaptive about which facets of CFT to incorporate into his feedback depending on what the teaching situation at hand called for* – thus being CFT-based not only in the content being introduced, but also in the metacognition he would be integrating into his own instruction.

Even as further discussion will be required to more fully ascertain what considerations might be needed to make such assessments "practical, doable, and desirable" within Mr. R's classroom setting, the CFT Expert, as the originator of the learning theory being discussed, nevertheless did not hesitate to praise Mr. R's "invention" of the "brilliant two-stage theory of feedback" as a "perfect manifestation of an application of CFT" that was "not currently a part of CFT" (PD6, 28:01-36:29). On the one hand, this was encouraging because in recognizing the potential of Mr. R's strategy to promote a new learning mentality (i.e., namely, that it "isn't over" after "one test" and instead should be something "that continues" over one's entire life), the researchers appeared to become more confident in their belief that "the goal of this project" – namely, exploring how theories like CFT/LICRA might be translated into practice in ways that could both make "researchers (and) theorists…happy" and account for teachers' professional "reality" and expertise – was an attainable one that had empirical merit (PD6, 28:01-36:29). But perhaps even more importantly, even as there "wasn't a lot of opportunity" during the planning discussions to integrate CFT/LICRA into his curriculum due to his class being "in review stage", Mr. R was explicit in noting that he (a) recalled "many times" where he found himself using the catchphrases, or "phrases" that were "similar", to inform his pedagogy; and (b) had a certain level of comfort with using the learning theory adaptively as "a 'tool in the toolbox' kind of thing" to promote "deeper thinking" depending on what a given student or group of students of his might need (PD6, 36:31-40:35) – a far cry from the start of the collaboration, when he felt he had "no room…(to) try to get (his students) to think about things differently" beyond "show(ing) them a film perhaps" (PD1, 45:46-49:50). In this sense, by "point(ing)…to ways (Mr. R) might evolve (his) teaching" in the future more broadly (PD6; 41:59-43:24), the collaboration evolved in a manner to not only make itself complementary to Mr. R's teaching "reality", but also uniquely situated to lay the groundwork to empower his navigation of its constraints.

4.2: Implications

When thinking about what implications can be derived from this study's findings, it is important to remember that study *did not* seek to determine the effectiveness of a particular CFT/LICRA-centered learning activity, infer causality from any learning outcomes reported by Mr. R, or even compare the conditions of his classroom setting (or within the collaboration itself) in a "before" and "after" manner. Rather, it was intended to serve as an *essential first step* to begin planning (e.g., by identifying ideas to be explored) future generalizable or systematic research that will be aimed at developing and testing a new translational framework – namely, by documenting, in a "seeing where things go" manner, how the

teacher and researchers attempted to attain mutual understanding with each other with the teacher's teaching goals and "reality" in mind. Thus, when thinking about what implications might be found from their "meeting of the minds", it seems most appropriate to refer to comments made by the collaborators themselves regarding their takeaways from taking part in the planning discussions, including insights they gained as a teacher or as researchers, their reflections on future use of CFT/LICRA in high school settings, and their thoughts (for better or for worse) on how they felt the collaboration itself turned out.

4.2.1. Insights Gained by Mr. R as a Teacher (Including Future Integration of CFT/LICRA)

To begin, building upon the researchers' expressed desire to "build upon (the collaboration) and make (Mr. R) go down in history as the father of the new education" (i.e., due to the merits of research to be potentially conducted within his classroom setting), the CFT Expert suggested that reflections on its key takeaways should first make note of how Mr. R, from a practitioner perspective, might have been impacted from a pedagogical standpoint by the "cognitive values" of CFT discussed (PD6, 41:59-43:24):

> "I think what I'm about to propose will also be a good prelude…how about if we just start with the cognitive values? These catchphrases (and) what they mean to you; what you think they meant to you earlier (and) how they might mean something different to you now; how these catchphrases relate to how you have always taught, but also how they might point in some way to ways you might evolve your teaching, 'cause you've always dynamically evolved your teaching."

Such a stance can be explained by the CFT Expert's emphasis on the collaborators (himself included) not forgetting the vital step to "studying ourselves" and any "evolving" in their thinking – lest they have a reduced ability to capture "the lessons all of us are learning" at this first stage, in a manner that could hinder future efforts to conduct CFT/LICRA research within Mr. R's classroom setting (PD6, 17:17-17:57). Because of this, he suggested that space be given for Mr. R to think about what he was "learning from us CFT people that might affect how (he would be) thinking about teaching in the future" (PD6, 17:24-17:30). Whether that involved noting Mr. R's thoughts about "the CFT catchphrases" or what he learned from the freedom "exercise", the CFT Expert postulated that whatever he wished to share would be greatly beneficial when looking ahead "to some second stage" involving CFT/LICRA that they might not "have time for now, but might have time for some time in the future" (PD6, 17:50-17:53).

But beyond this, the CFT Expert expressed the sentiment that Mr. R specifically, across the collaboration, had come across to him as a teacher who was "always dynamically evolved (his) teaching", in terms of being willing to put in the work necessary to "get better with experience" and "think of new things" that might improve student learning outcomes within his teaching "reality" over time (PD6, 41:59-44:25). With this in mind, he envisioned Mr. R's teaching mindset as a valid "point of departure" –

in terms of noting not only ways that principles associated with CFT, as signified by the "catchphrases", had "always" been "part of (his) teaching", but also how his opinions might have changed about the catchphrases (i.e., compared to how he "understood them originally") or how "they might become part of (his) teaching in the future" (PD6, 43:24-44:25). For example, when critiquing those "thinking about and teaching history" who tend "to pick…famous, clear, somewhat more clear-cut examples" to teach, he cited Wittgenstein to argue for the importance of offering students the chance to examine "intermediate cases, the ones that aren't so clear cut, 'cause that's how the world is" – which could easily be interpreted as him endorsing Mr. R's previously stated desire to use his lessons to help students see "how the world is, contrary to how you're asked to teach about the world" (PD1, 1:18:29-1:18:45; PD6, 47:24-48:11).

After hearing such sentiments from the CFT Expert, when discussing how his pedagogical knowledge and his understanding of CFT/LICRA as learning theory interacted across the planning discussions, Mr. R eventually appeared to respond to such a request in an indirect manner by sharing something he had learned about in the preceding year: the "swill dairies", a part of American history that, to him, touched upon many key historical topics, including "Southern comfort", industrialism, New York's financial sector, and the implications of people at the time praising institutions as "wonderful" if they were associated with how "money and finance (came) together in this investment capital thing" that helped create America (PD6, 48:11-48:48). Upon being told by both researchers that they had not heard of the "swill dairies" before, Mr. R described the historical event as follows (PD6, 48:49-49:37):

> "They were creating really cheap booze to sell all over the area of New York. And so, they had a terrible waste problem with all of the grain that they were disposing of from the making of the booze process. And so, they came up with this wonderful idea of taking all the crappy grain that all had the juice sucked out of it and feeding it to cows. And then the milk from the cows was so awful. It didn't matter 'cause they were selling that to the slums and the people of New York. And those were the financers, those were the industrialists who everybody would praise and go, 'Oh, they're living in the best houses in New York'…and they were doing *this* on the other (side). You know, so that's the, 'Oh, look on one side, they were just great for America.' And then, on the other side, 'Oh, see…' And then – yeah, that's a wonderful story. I just learned that story this year, I have to remember that."

When thinking about the implications of this study's findings, what is critical to note from this exchange is that Mr. R's eagerness to "remember" this "wonderful story" starkly contrasts his demeanor from earlier in the collaboration that has been previously alluded to – namely, when he expressed remorse for how his teaching ambitions had been dampened over time by not being given enough time to

"do anything that would make (his students) independent, critical thinkers" due to the need for them to be prepared to "take these standardized tests" to demonstrate their "growth" (PD1, 41:57-42:52). In this sense, having the chance to discuss how CFT as a learning theory might facilitate moments of deeper thinking "*within* those constraints" of his classroom setting appeared to have a *motivational* impact on Mr. R (PD2, 34:08-34:10). Put another way, as the researchers discussed with Mr. R how it might be possible for him to integrate CFT/LICRA (while also reaffirming what he was already doing well), it could be argued that his mentality began to shift from feeling helpless to address his students' inability to "give a *shit* about anything" to feeling invigorated by the challenge of finding "cases" that could serve as a "wedge outward" to help his students begin thinking in more complex ways about the historical topics, figures and concepts covered across his U.S. History curriculum (PD1, 42:54-43:16; PD2, 33:13-40:30). That said, even as Mr. R began referring to the CFT "phrases" himself and expressed a readiness to utilize CFT strategically to help his students engage in "deeper thinking" (PD6, 36:31-40:35), additional steps will need to be taken to more clearly ascertain from Mr. R (a) how his interactions with the CFT/LICRA researchers might have impacted him more broadly as an educator; and (b) what interventions or lesson plans that formally integrate "CFT-ish" activities into his pedagogical strategies might look like when he is given more than "the last few days of the semester" to implement them (PD5, 27:46-28:00).

4.2.2. Insights Gained by Researchers from Learning Mr. R's Perspective and His "Reality"

Alongside capturing the teacher's thoughts about how the collaboration unfolded, just as much priority was placed on noting what the researchers reported "learning from (Mr. R) as a teacher that affects our thinking about how CFT might go in schools" (PD6, 17:19-17:24). Towards the end of the planning discussions, the CFT Expert pointed out that the "ultimate goal" of the collaboration was to succeed in taking a "beginning step" towards identifying how researchers and teachers might come together to address the need for "a new way of thinking in schools for society", one that can better respond to the emergence of a "more complex and rapidly changing time" that will ultimately require students to learn "adaptive skills" if they want any chance to "even be able to get a job" as adults (PD6, 17:08-19:24). But even as he lamented that such "adaptive skills" represent "a different way of thinking" than what is currently being observed from many teachers and children due to what they are being "rigidified" to promote or display within "traditional schooling" environments, he was quick to note that that criticism did "not so much" apply to Mr. R, proceeding to praise him for how he was "always thinking" about what he might do as a teacher to "produce learning outcomes that are desperately needed" for his students' future success as they attempt to navigate the real world (PD6, 18:05-19:24).

With this in mind, even as the researchers began the collaboration with the goal of selecting ideas underpinning CFT "from the Ivory Tower" to present to Mr. R in an accessible way well-suited for enabling a "good collaborative translation of theory into practice" that could be emulated by other

communities of practice, they themselves appeared to gradually internalize and prioritize a more even balance between such broader "thinking about the future…that many are predicting will *come our way*" with making sufficient space in their thinking for "talking about (Mr. R's) reality" specifically and what might complement his unique efforts to prepare his students for navigating such a "complex and rapidly changing" future (PD1, 45:46-46:43; PD6, 19:14-19:21). As a result of this development, a reciprocal influence began to emerge between the collaborators – such that even as time was spent pondering what might be involved when Mr. R is "trying to apply some of those catchphrases", there were also moments when Mr. R's recounting of his teaching "reality" seemed to trigger an evolution in *the researchers' own understanding* of what might be needed to utilize CFT to promote a gradual "inching towards embracing complexity" within authentic K-12 classroom settings (PD2, 1:05:23-1:06:24; PD6, 18:05-19:24).

To give one noteworthy example, when discussing the importance of considering the "different perspectives involved" and the "variables…that come to play…all the time" during historical events, Mr. R provided the case of Pinkerton's Detective Agency and how they developed a "wonderful reputation" as "the precursor to the Secret Service" by serving as "the guards of Abraham Lincoln" (PD6, 39:35-40:35). More specifically, he made it a point to note how they could also be seen as "some really nasty, nasty people" and "thugs" by offering the example of "what they did to some strikers in Chicago and strikers elsewhere when they were called out" – in a manner validated by the CFT Expert when he pointed out how their "'bad guy' side" was presented in the film "Butch Cassidy and the Sundance Kid" (PD6, 39:35-40:56). In response, Mr. R's historical example was applauded as a great one for promoting "non-'black and white' thinking", in the sense that explaining how Pinkerton's were "kind of good guys in some ways" and "bad guys" in other ways appropriately placed their impact on American history in the "gray area…where a lot of the world resides" (PD6, 41:02-41:59). And as a direct result of this exchange, the CFT Expert proceeded to ask if "we have something" in the CFT catchphrases "that says, 'Don't think black and white'"; and upon being informed that such a phrase had not yet been added to the list, the CFT Expert immediately recommended that we "add to the list" such a phrase, in order to denote how CFT promotes "anti-compartmentalization" via avoiding the temptation to reductively engage in "black and white, either/or, anti-dichotomist, anti-binary kind of thinking" (PD6, 41:02-41:59).

Examining this bidirectional intersection between Mr. R's teaching "reality" and CFT as a learning theory more closely, the CFT Expert seemed to be acknowledging that Mr. R's example (which was informed by his expertise as a teacher) had illuminated an additional key "lens" of CFT that had been previously overlooked during the collaboration – namely, one that was centered on the notion that "nothing is that *clear cut* in history" and that a deeper understanding of cases like Pinkerton's often requires acknowledging that "there's some good and there's some bad" usually involved at the same time, as opposed to trying to reductively "put everything in either the 'good' box or the 'bad' box, the 'evil'

box or the 'not evil' box" for the sake of convenience, simplicity or wanting to have a "right" answer that is easier to memorize for some standardized test (PD6, 41:02-43:24). Thus, by recommending an immediate course of action to address the flaw spotted as a *direct result* of Mr. R's insights (i.e., by adding the catchphrase "Don't Think in Black and White!"), the researchers overtly demonstrated that his influence on their thinking was not limited to their merely becoming more attuned to Mr. R's teaching "reality" (and its inherent "constraints") that would need to be duly accounted for when implementing CFT/LICRA studies within his classroom setting (PD6, 45:26-45:59). Rather, Mr. R's pedagogical expertise appeared to also be capable of deepening and enriching the researchers' understanding of CFT more broadly *as a theory of learning*, in a manner likely to influence their future scholastic endeavors both within the collaboration being examined for this study's aims and beyond. However, in order to meaningfully build upon such an impact, it will be important for the researchers to (a) create additional opportunities for Mr. R, as well as other teachers, to share what might make it more difficult for them to think about and apply new theories of learning to their pedagogy in less "rigidified" ways; and (b) be open to their comments about what scholars might be overlooking when trying to conduct research aimed at promoting "different way(s) of thinking" in K-12 students (PD6, 18:05-19:24; 1:05:23-1:06:24).

4.2.3. Preliminary Advice for CFT/LICRA Researchers Working Within High School Settings

Even as the teacher and researchers involved in the collaboration sought to learn from each other's perspectives as they brainstormed how CFT, as a "cognitive learning theory that fits the needs of jobs, of society, of our current time", might be integrated *within Mr. R's classroom setting specifically*, space was also allocated for them to reflect upon what preliminary insights gained from their community of practice might suggest about how CFT – or other learning theories that education researchers are trying to translate into practice – might be meaningfully applied to support the learning of U.S. History within *high school classroom settings and "traditional schooling" more broadly* (PD6, 18:05-19:24). Across the collaboration, the researchers expressed no interest in "writing out instructions" beforehand for Mr. R to blindly follow regarding how his implementation of CFT "should be done" within his classroom setting (PD4, 56:42-56:52). On the contrary, as previously mentioned, they were quite resolute in centering the planning discussions around Mr. R's "milieu, not *our* milieu" – namely, by framing the story of how the collaboration should unfold around what could be learned from his "experience…knowledge of the kids…(and) knowledge about teaching these topics" within his curriculum (PD4, 56:53-57:04). But beyond this, the CFT Expert ultimately offered an even stronger opinion regarding his long-term vision for the collaboration – namely, his desire as an academic researcher to frame Mr. R as "the vanguard…the exemplar of a new kind of learning and instruction, not just in (his school district), but worldwide" in news articles and beyond (PD4, 27:59-28:26). In this manner, keeping in mind that this study is meant to serve as a preliminary analysis aimed at planning for the development and testing of a new translational

framework (rather than being a research study paper itself), it is worth noting the researchers' willingness to model the sort of attitude that they believed scholars involved in communities of practice *should* display – namely, being receptive to what that can be learned from how the actual "reality out there" is being navigated by teachers like Mr. R, as well as the key role such insights can play in circumventing the "academic bullshit world of jargon" to enact meaningful education reform (PD4, 57:05-57:28).

For example, when Mr. R expressed his support for the idea that history should be viewed as having "no black and whites, only shades of gray", the CFT Expert extolled the value of the collaborators trying to "keep our feet to the fire" by using the CFT catchphrases as "a way for us to think about where we were coming from when we started, where we are now, where we might go" (PD6, 45:20-45:59). In response to that sentiment, Mr. R shared with the researchers a "story" that he "usually" told his students "right at the beginning of the year", one that he described as worth sharing due to how it "speaks to this whole idea of 'don't think in black and white', 'not that simple', 'it depends'" (PD6, 45:59-47:01):

> "I could never be a policeman, right? I could never be a policeman, because I can't believe that people are black and white. I mean, not that they can't be black and white, but you just can't put people in two categories – criminal and non-criminal. You know, somebody that I have to treat this way and this person that I'm not gonna treat this way. So it's like, I could not arrest a person that was stealing bread if I found out that the bread was for their family and there's people starving at home. So it's like…you know, I couldn't be that person to do that. And so, for me, there are always shades of gray. There is no black and white ever."

The CFT Expert was quick to identify that "story" as something that could become "a kind of, at least partial, guiding principle for selecting examples" and trying to "get that point across" that "there are always shades of gray" in history, as Mr. R put it – even going so far as to cite Les Misérables and Jean Valjean's "whole life journey", in terms of the "dominoes that fell" after he "stole some bread for his family", as a similar story that Mr. R could use to make his point if he had "endless time and kids who could actually read it" (PD6, 46:19-47:32). On the one hand, by favorably comparing Mr. R's "policeman" story to other educators' tendency, "in thinking about and teaching history, to pick clear cases", the CFT Expert again displayed respect for Mr. R specifically as an educator (PD6, 47:33-47:47). But on a broader scale, even as Mr. R's unwillingness to be the sort of person who might "put people in two categories" and treat them differently as a result offered a noteworthy example of how teachers' pedagogical approaches can be largely shaped by their internal motivations and lived experiences, his anecdote also highlighted the importance of not regarding teachers from a scholastic standpoint as interchangeable in terms of their teaching outlook or how they might apply a given learning theory. Such

a takeaway point builds upon with an opinion previously shared by the PI that is relevant for future framework/paradigm research (including studies undertaken by the CFT/LICRA researchers and Mr. R themselves) – namely, that CFT scholars could benefit from relying less on conducting studies in "laboratory setting(s)" that are "cut off from a lot of…that anchoring in the reality of what students in authentic classroom environments" actually experience, and instead seek to design research more fully centered on teacher voice and thoughtful examination of what might make the learning theory "digestible and integrable into what the teacher's doing" within their authentic learning context (PD4, 57:28-58:17). However, the success of such undertakings will largely depend on said scholars' willingness to receive criticism regarding the "classroom realities" they are "pretty ignorant of" and consider research design methodologies that better account for what teachers have to navigate on a daily basis (PD1, 13:52-14:41).

4.2.4. Collaborators' Thoughts on Sharing Different Perspectives During Collaboration

Finally, when thinking about key takeaways the teacher and researchers had pertaining to the collaboration itself, it is first worth noting that they explicitly expressed the need to debrief at a later time about how their understanding of CFT as a learning theory evolved over the course of the planning discussions, particularly in order to have the opportunity to "go deep" and reflect further upon what the CFT catchphrases had come to mean to them "cognitively,…what (it) means to all of us in thinking about teaching" (PD6, 44:25-45:08). More specifically, they seemed to anticipate that further discussion could play a critical role in more meaningfully directing insights gained across the collaboration towards "our planning for the future", albeit in a manner where any teaching strategies ultimately conceived would likely "all, in some sense, (be) interrelated to each other" just as the CFT "cognitive values" discussed were (PD6, 43:57-44:57). But even as such a debriefing was framed as important for the collaboration's "potentials" to inform future research and "future teaching", the CFT Expert also expressed wanting to use that period to talk to Mr. R about "how can *we* add something about how *we* see (the "cognitive values" promoted by CFT) that you didn't think of, and how can *you* add something about how *you* see them that we didn't think of" (a sentiment that Mr. R immediately endorsed); and such a shared sentiment has strong implications for this study's findings (PD6, 43:47-44:57). Namely, when the collaborators undertook a "meeting of the minds" across the planning discussions, it fostered a heightened ability and willingness on their part to explore how *the perspectives they each held might be "interrelated" as well*.

For instance, building off what was previously discussed about the "swill dairies" and how "financers" and "industrialists" sold bad milk from cows being fed with "crappy grain" to "the slums" of New York even as the financial sector was being praised as "this wonderful thing" (PD6, 48:18-49:23), the CFT Expert complimented Mr. R's willingness to offer his students an alternative perspective to the "capitalism is great" narrative by offering valid points about its "downside" (e.g., "increases wealth inequality", "suppresses some people", can lead to children working "in mines for 18 hours a day for a

quarter an hour" if proper regulations are not being enforced) (PD6, 49:37-50:09). However, he also cautioned that students already staring from a "capitalism is horrible" should be encouraged to "work…to the middle and see some of the good things about it", in order for them to internalize how capitalism "can be seen as positive in some ways and a negative in some ways" as opposed to rigidly adhering to a "black and white" way to evaluate its impact on society in the opposite direction (PD6, 50:14-50:39). And in response, Mr. R actually built upon *that* new sentiment by remarking that even as questionable business practices led to low-quality milk "winding up with the immigrants", those same immigrants were "coming over to the United States" in order to "work in the factories" – a cyclical relationship that he believed told a "wonderful, crazy, only American story", which the CFT Expert thereafter connected to how "a lot of people talk about immigrants today" even if their families "were immigrants too" (PD6, 50:57-51:38). In moments like this, the collaboration captured how Mr. R's perspective, as demonstrated through his historical knowledge and pedagogical expertise (e.g., his translation and use of "phrases many times" that were "similar to our catchphrases"; PD6, 37:24-37:38) were shown to be "interrelated" to the researchers' more scholastic perspective – a mutually beneficial dynamic that noticeably grew over time as it was directed towards exploring how CFT might be best integrated within Mr. R's classroom setting.

But beyond seeing a debriefing period as a valuable chance to further verify key points of "interrelatedness" potentially discovered between their different perspectives, the teacher and researchers also saw such a meeting as important due to it also being an opportunity to use the catchphrases "as a point of departure" to get a sense of "the past, the present, (and) the future" of their emerging community of practice from a "meta-analytic" standpoint – namely, by taking a "step back", reflecting on how "this collaborative process" unfolded, and "think our thoughts about our thinking together", including considering what "things we gained" and where the planning discussions "could…have been better" (PD6, 52:52-54:27). Such a step would be limited to some degree by the nature of what data could be feasibly collected to facilitate such reflections, and the collaborators were well aware of this. More specifically, they recognized that any debriefing efforts of their would likely be limited by (a) an inability to examine "identifiable student data" from the time period overlapping with PD1-PD6 due to lack of student consent, although Mr. R was strongly encouraged to continue sharing any "general observations about students" that he wished in a deidentified and journalistic manner; and (b) the researchers' desire to frame requests for supplementary data from Mr. R (e.g., "templates" of lesson plans "that don't have any student entries", anything written down as "translations" of the catchphrases, "notes" taken about his teaching experiences) as strictly optional, chiefly due to not wanting to unnecessarily add to his existing workload given the "constraints" he was operating under at the time (PD6, 54:28-55:15). Nevertheless, when thinking about the implications to such reflections for the purposes of this study specifically, what is important to note is that they mutually came to recognize and accept the time and logistics that would

be required from each of them to engage in the sort of "top-level view" needed to critical examine their "history of interaction" and how "the collaboration" of theirs unfolded over time (PD6, 52:52-54:17). In this sense, the teacher and researchers came to embody the sort of eschewing of antiquated roles – that is, roles that regard teachers as "recipients of research" and researchers as "distanced…silent observer(s)" (Englert and Tarrant, 1995, p. 326; Ulichny & Schoener, 1996, p. 502) – that will likely be essential for not only the success of any future iterations of their collaboration, but also the success of any scholars and teachers hoping to create ethical and mutually beneficial communities of practice moving forward.

4.3: Limitations and Future Directions

4.3.1. Limitations of Study

As previously emphasized, this study is not itself intended to be research; but rather, in conducting in-depth analysis of an extended series of planning discussions, it is meant to serve as a foundational first step for developing and testing a translational framework for informing conduct within a new subfield of research (including studies conducted by the collaboration examined for this study). In light of the dissertation being designed as a qualitative case study for such a preliminary purpose, it is *not seeking to generalize* its findings because that mentality would be counterproductive to one of the key tenets of this study – namely, that in order for this study to serve *as a proof of concept or exemplar* for how future collaborative efforts within this new empirical area of inquiry should operate, there is a need to account for the unique features present in whatever teacher-researcher collaboration is being examined. That being said, even as there is empirical merit for the study being designed in such a manner, it is nevertheless important to explicitly note the limitations that have come with how this study was designed.

To begin, examining this collaboration's "particular circumstances" was intended to serve as a preliminary "'telling' case" due to its potential ability to "make previously obscure theoretical relationships suddenly apparent" and thus "establish…valid connections between events and phenomena which previously were ineluctable" (Tight, 2017, p. 16; citing Mitchell, 1984, p. 239). Nevertheless, by nature of this dissertation, as an exploratory case study, being focused on analyzing a single teacher-researcher collaboration's exploratory efforts in relation to the teacher's specific classroom context, there is an inherently limited ability to generalize any of its findings to other learning contexts. Put another way, we cannot be sure of the degree to which any findings reported for this dissertation study (e.g., phenomena reported by Mr. R related to his students' learning or his own teaching practice) would be "representative of the wider body of 'similar' instances" of K-12 classrooms teaching U.S. History and how students (and/or teachers) in those settings might respond to CFT/LICRA (McLeod, 2019, n.p.).

For example, Greene, et al. (2015) found that those with greater experience in online learning and more schooling tend to attain higher achievement in courses involving online instruction (e.g., massive open online courses or MOOCs). In line with this reasoning, while this study aims to address concerns

raised by Clemente (2018) regarding prior CFT/LICRA research's tendency to recruit students in higher education or Web learners identified as "advanced" (e.g., DeSchryver, 2012; 2017; Cheng, 2015), any impact of CFT/LICRA anecdotally shared during the planning discussions might fail to be displayed to the same degree within other K-12 classroom settings that (a) have more limited integration or availability of digital resources; or (b) teach U.S. History to students with less schooling or experience with online learning compared to Mr. R's pedagogical approach. For instance, Mr. R noted to the researchers his efforts to enable student access to a computer "bank" during his classes and incorporate media like "The Grapes of Wrath" to discuss historical events like the Great Depression (PD3, 50:47-51:45; PD1, 49:23-50:30). Thus, even if significant learning effects are eventually observed in the future under more systematic and formalized research conditions within Mr. R's classroom setting specifically, we cannot be sure if such empirical findings would carry over to learning environments where efforts to embrace digital technologies and understand history's complexities are comparatively reduced or nonexistent.

Even further, as noted by the CFT Expert, emphasis was placed by the collaborators on not presenting a "normative value of what's good" for any given historical topic, lest Mr. R and the researchers end up "in hot water from the other side of whatever…beliefs we have" (PD1, 24:08-24:34). Because of this precaution, it could be argued that any of the collaboration's efforts within Mr. R's teaching context might not even be able to definitively ascertain the degree to which *Mr. R's students themselves* might apply CFT/LICRA to learning about societal issues perceived as more controversial or polarizing (e.g., vaccine mandates, election fraud, violent acts or protests against elected officials). However, it is hoped that this study's findings can inform future research designed to examine the effects of exposure to CFT/LICRA on K-12 students with varying degrees of schooling (e.g., middle school vs. high school), experience with online learning and/or personal investment in the topic being explored.

Second, as noted earlier when discussing how this study's scope has been recognized by IRB, this study is focused on taking initial steps to examine the bidirectional intersection of new learning theories and teachers' understanding of them, in a manner that neither obtains approval or oversight from Mr. R's school district or qualifies as "human subjects research". Because of this, no direct interaction between the researchers and Mr. R's students ever occurred, and nothing with "identifiable student data" (e.g., student submissions) was able to be shared with them during PD1-PD6 or when reporting this study's findings (PD6, 54:28-55:15). Rather, everything learned about them was be limited to the testimony, anecdotes and journaling shared by Mr. R, with even that data had to be deidentified by him before it could be shared with the researchers during the collaborative discussions. Thus, the ability to examine the impact of the collaboration on Mr. R's classroom context specifically was limited in several key ways.

To begin, because there were no opportunities to interact with Mr. R's students before the study, in terms of assessing their knowledge or learning beliefs, academic performance or attitudes related to

U.S. History (or high school more broadly), it was not possible to get a profile of them as learners *prior to the start of the collaboration* as a point of comparison. In turn, as noted before, Mr. R expressed sympathies for CFT as a learning theory from the first planning discussion and had even made efforts to insert "little wrinkles of complexity" to promote a deeper and more complex understanding of U.S. History even *before* his involvement in the collaboration examined for this study (PD2, 44:56-45:54). Thus, it was not possible to fully ascertain the degree to which Mr. R's pre-collaboration instruction might have instilled a *readiness* in his students to respond favorably to a learning theory that embraces complexity within ill-structured domains of knowledge like history – thereby incorporating an unavoidable confounding effect that is distinct from Mr. R's implementation of CFT/LICRA itself into his classroom setting. And finally, even as the researchers encouraged Mr. R himself to use journaling as a means to document his insights regarding using CFT/LICRA in his teaching as they emerged, there was not a similar opportunity during this study to directly observe or capture Mr. R's students' patterns of thinking, learning or Web behavior *in the moment* (e.g., while completing the "freedom" learning activities), nor was there any chance to ask them prodding questions aimed at ascertaining their rationale while they grappled with such classroom instruction (e.g., as utilized by Clemente, 2018; see Appendix R for examples of during-task probing questions asked to participants during LICRA Web-based activity). It must be noted that Mr. R did present a multitude meaningful in-class anecdotes during his planning discussions, and such instances did offer a richer understanding of how CFT/LICRA might be influential as a learning theory when translated into practice within his classroom setting. However, due to Mr. R having roughly 25 students in each class he was teaching at the time of this study and not being able to record during his classes (since that would risk students being identifiable without giving proper consent), it is understood as a given (by nature of the multitude of responsibilities that Mr. R had to attend to during his classes) that this study's efforts to document his students' thinking and learning were fairly limited.

Third, given that the planning sessions for this collaboration that covered Mr. R's effort to incorporate CFT/LICRA into his classroom instruction took place during his class's "stage of review" before final exams over a couple weeks "towards the end of the school year" (PD6, 38:18-39:55; PD3, 55:08-56:06), it must be acknowledged that this study did not allow for the time or curricular flexibility needed to fully ascertain the impact of exposure to CFT/LICRA principles on Mr. R's students' learning (or on Mr. R himself as an teacher). Put another way, when in a given classroom to more systematically monitor the learning effects of exposure to learning theories like CFT/LICRA (e.g., students' willingness to develop "web-like" knowledge structures to capitalize on the Web's nonlinearity; Spiro and Jehng, 1990), it must be noted that cognitive "habits of mind" take a considerable amount of time to develop (and likely even longer to change or unlearn them if they are maladaptive); and this exploratory case study was never intended to incorporate such a methodological design. Even further, this study was not

designed to empirically measure the degree to which Mr. R's students' responses to "cognitive values" associated with CFT (e.g., as represented by the catchphrases) might have been affected by their prior exposure to teaching practices that encouraged a more reductive, oversimplified understanding of U.S. History or use of the Web for learning purposes (e.g., Spiro, et al., 1996; Spiro, 2006e).

Beyond such considerations from a cognitive standpoint, by Mr. R's own admission, even over the course of the iteration of the teacher-researcher collaboration examined for this study, he had to navigate around constraints put on his teaching that were predominately centered on using "standardized tests in order to show that (students) have demonstrated growth", rather than designing "anything that would make them independent, critical thinkers" (PD1, 42:16-42:20). And indeed, part of what motivated the CFT/LICRA researchers' efforts to identify "mutual understandings" with Mr. R was the limited availability of assessments or other teaching resources designed to evaluate students' use of "novel problem solving" or other higher-order behavior promoted by CFT that will likely be necessary for students like Mr. R's to "get a job in a few years" (PD1, 41:12-41:57). With that in mind, as noted by the CFT Expert, this dissertation sought to take the important first step of brainstorming how Mr. R might foster a "little incremental opening up" in his students' patterns of thinking, rather than expecting them to go "all the way down the path" of changing their learning mindset (PD2, 1:26:45-1:29:37). Put another way, this study simply aimed to begin exploring what might help "start (Mr. R's students) down the path" of recognizing the complexity of history and that "there isn't a single right answer to everything" (PD2, 1:29:13) – an empirical approach centered more on providing preliminary information to inform more systematic and generalizable research in the future, rather than trying to causally determine what "works" best within Mr. R's classroom setting (or other K-12 learning environments) in this study specifically. Nevertheless, taking such a step at this early stage is critical to ensure that future efforts to conduct research within the "constraints and limitations" of Mr. R or other teachers' authentic classroom settings are more ecological valid and build upon a more reliable translational framework (PD1, 52:35-53:02).

And finally, it is important to also recognize the ways that the unique actors involved in *the collaboration itself* (i.e., the PI, the CFT Expert, and Mr. R), as well as *how* their participation was arranged, might limit the degree to which these study's findings can be generalized to "similar" teacher-researcher collaborations. To begin, there was a considerable amount of expertise from both an academic and pedagogical standpoint represented in this study, including the CFT Expert originating the cognitive theory of learning being discussed and Mr. R having decades of experience teaching U.S. History to K-12 students that was preceded by extended time in retail management roles that strongly honed his interpersonal skills. Thus, alongside the fact that Mr. R and the CFT/LICRA researchers directed their focus on learning U.S. History specifically (as opposed to other subject areas like reading or science), if participants in other communities of practice do not have similar degrees of preexisting knowledge or

expertise (including their understanding of CFT/LICRA or whatever learning theories might be discussed) and access to resources (e.g., professional connections, access to article databases), that could lead to noticeable differences in how their collaborative work unfolds and the challenges that they might need to navigate. Therefore, it must be clarified that this study aspires to provide meaningful ideas and insights for an *expert* bidirectional translation framework or model, although it is also hoped that it can ultimately be used in the future to help teach *novices* in the education field how to apply the model as well. Second, given that this study was formally classified as not "human subjects research", any teacher-researcher collaborative undertakings requiring stricter IRB approval and/or specific approvals or oversight from the school or school district that the participating teacher(s) are operating within might affect the priorities emphasized during such studies. For instance, needing district approval might lead to their examining a learning theory's impact on student performance for particular standardized tests, as opposed to how it might promote their deeper learning *in spite* of schools' focus on standardized testing. And third, in line with recent scholars' efforts to address how implicit bias can impact both teaching practices and education research itself (e.g., "racialized and gendered patterns" in classroom settings; Reinholz, et al., 2020), it is worth again acknowledging how the positionality of the three collaborators involved in this study might affect the nature of the discussions that occurred, as well as (in the case of the PI) which trends were identified during data analysis of the discussion transcripts or other materials shared. Thus, any future research focused on how teacher-researcher collaborations might facilitate translation of CFT/LICRA or other learning theories into K-12 settings should prioritize incorporating the perspectives of scholars and educators from marginalized backgrounds (e.g., women, people of color).

4.3.2. Future Directions

When thinking about how education researchers can build upon the findings of this exploratory case study, it is critical to first return to the primary aim of this dissertation – namely, to conduct a preliminary analysis of the first "meeting of the minds" between Mr. R and the CFT/LICRA researchers, such that any insights made can direct the planning of future research for the sake of developing and testing a new framework or paradigm for more meaningfully translating learning theories into practice. And indeed, such an undertaking would be methodologically flawed at best and empirically hollow at worst if steps were not arranged to give due respect to the "authoritative voice" of teachers like Mr. R who have the strongest understanding of students' learning needs within their "local contexts of implementation" (Kirk & MacDonald, 2001, p. 565), lest any meaning-making undertaken by Mr. R and the CFT/LICRA researchers fail to incorporate a proper "negotiation of (their) joint enterprise(s)" in relation to the "specific resources and constraints" inherent to Mr. R's unique classroom setting (Wenger, 1999, pp. 73-79). Thus, as an immediate next step, it is a top priority to have this study's findings *verified by the CFT Expert and Mr. R as fellow collaborators*, such that sufficient opportunity can be given for

them to provide "agreements" and "expansions" or corrections as needed to what has been here recounted about the planning discussions (as worded by the CFT Expert to the PI via email on June 24, 2024).

For such an empirical purpose, building upon the collaborators' shared desire (as expressed during PD6) to take part in a "debriefing" session, there will be a need to first conduct *a formalized expansion of this study's methodological design* (i.e., by administering the aforementioned interview protocol to Mr. R and the CFT Expert, with correspondence via Zoom or email as needed), which will have several central goals in order to ensure that the study qualifies as empirical research and meets the standards for peer-reviewed publication. First, in order to ascertain the degree to which the PI's recounting of key interactions between Mr. R and the CFT/LICRA researchers during PD1-PD6 are empirically "worth its weight in gold" (as phrased by the CFT Expert to the PI on multiple occasions via text in January 2022) and thus suitable for informing future development of a translational framework or model, the collaborators will be individually asked to give their sense of whether the PI's recaps (as shared in "Results") are accurate or if they need correction or further elaboration.[8] In addition, building upon notes jotted down by the PI when completing the "Question Document" (see section 2.3), space will be given for the collaborators to further reflect upon said interactions in ways that might have been overlooked or unable to be fully explored during the planning discussions themselves, including elaborating further on insights they made upon being exposed to the other collaborators' perspectives (as well as how said insights might have affected their ensuing professional endeavors) and their thoughts about how the collaboration itself unfolded (e.g., what went well, what could have gone better). And third, the interview protocol will incorporate a forward-looking component, for the collaborators will be encouraged to think about what might facilitate more formal translation of CFT/LICRA to the teacher's classroom setting, as well as might be incorporated into a framework to support other teachers' efforts to incorporate CFT/LICRA into high school U.S. History curricula (or into K-12 instruction more broadly). Collectively, it is hoped that such an expansion of this study will further ensure that the collaborators have a "mutual sense" of the most meaningful takeaways from the initial iteration of their collaboration, as well as how key findings from their planning discussions should be presented to outside audiences.

More specifically, across all sections the interview protocol, each topic presented will be divided into three parts, each with its own purpose in relation to the aims of this study in its planned expanded form. First, a *detailed recap* with "relevant background paragraphs" will be shared, in order to "set the scene" and refresh Mr. R and the CFT Expert's memory about those interactions given the extended

[8] Only one of two researchers (i.e., the CFT Expert) will be asked to give verification, since the other researcher (i.e., the PI) is the author of this manuscript and the interview protocol itself. Thus, the PI's role will be to document the responses to the interview protocol shared by the other collaborators, as opposed to completing it himself.

period of time between the completion of PD6 and their receiving the interview protocol to complete (as noted by the PI in email correspondence with the CFT Expert on March 14, 2023 and April 2, 2023). It is worth noting that the "background paragraphs" (and the corresponding titles for each topic) that will be incorporated into the interview protocol *will substantively be the same as the ones used to share this dissertation's findings in the above "Results" section*, with the exception of several topics (i.e., under an "Epilogue" section at the end to be aimed at "looking ahead to future collaboration") that will be added to allow the collaborators to more thoroughly debrief with each other than was possible during PD6. [Note: See Appendix S for the tentative outline of the 28 "topics" outlined for the planned interview protocol.]

Second, under each topic in the protocol, the collaborators will be asked *a standard set of "mutual sense" questions*, in order to formally verify whether or not they agree with how their interactions related to said topic were recapped in the "background paragraphs" and offer corrections, clarifications and/or comments as needed. Such a section will serve as a formalized opportunity to assess Mr. R and the CFT Expert's assessment (and, if given, their critiques) of the PI's summarization of the key interactions and takeaways from their planning discussions for the purposes of this study, in order to obtain a "mutual sense" between the three of them of how the collaboration as a whole unfolded. For this purpose, the following three "mutual sense" questions will be asked to each collaborator under each topic (with certain phrases bolded to correspond with how they are bolded in the protocol itself):

1. First and foremost, **do you agree with how your opinions and/or ideas** (as shared during our collaborative discussions) **were described** in the above recap? If not, what do you think should be clarified or corrected about what your thoughts on this topic were?
2. Assuming they were presented correctly, **do you still agree with the opinions and/or ideas that you shared** during our collaborative discussions related to this topic? If not, what would you change, correct or clarify about your views on this particular topic?
3. Alternatively, **would you like to expand upon any of the opinions and/or ideas that you shared** about this particular topic during our collaborative discussions? If so, what would you like to add when describing your position on this particular topic?

Is it worth briefly noting that an additional "mutual sense" question is being considered for inclusion in the expansion of this study, which would seek to ascertain if the collaborators would "like to connect (their) thoughts" about the topic at hand "to anything else…covered in the Interview Protocol"; but as of now, for the sake of simplicity, it is not planned for inclusion in the interview protocol itself as of now. And third, Mr. R and the CFT Expert will each be presented a set of *follow-up questions for each topic*, which will be aimed at building upon the interactions and insights documented in the corresponding recap

by asking questions and bringing up ideas unable to be fully explored during the planning discussions. Sometimes the collaborators will be asked the same questions (or variants of them), while at other times they will be asked questions individually tailored to their unique perspectives (i.e., as a researcher or teacher). To minimize risk of confusion, Mr. R and the CFT Expert will each receive their own version of the protocol, which will (a) be identical in layout with the exception of only including the follow-up questions that they are each supposed to answer; and (b) explicitly use labelling to denote whether a given question has been asked to both parties being interviewed or asked to one collaborator specifically.

The interview protocol has been designed in this manner for several critical reasons. To begin, given the extended amount of time that has since the planning discussions, it is hoped that providing a detailed recap for each topic (using what is included in "Results") will proactively account for the likelihood that the collaborators have forgotten at least some details from their prior interactions during PD1-PD6 specifically, while also offering a chance to have greater cohesion between the methodological design utilized for this dissertation and the study's planned expansion to strengthen its empirical rigor. Second, in the spirit of having all collaborators on equal footing, it feels appropriate to incorporate some sort of "member check", in order to ensure that the PI's attempt to chronicle their planning discussions (as well as some of the most notable takeaways from them) as reported in this manuscript is reasonably aligned with the other collaborations' recollection of those experiences before the findings of this study are shared on a wider, peer-reviewed scale with professional colleagues in academia and elsewhere. And finally, it is hoped that such an approach will align with the *ethics and principles central to the formation of the collaboration itself* – namely, by having insights previously shared by the collaborators themselves *directly inform* the next iteration of their community of practice. Put another way, in order to utilize this dissertation for planning the future development and testing of a translational framework, there is a need to ensure that any rationale pertaining to that is underpinned by the goal of keeping the 'development of mutual understanding' between the collaborators as "the main focus" – not only during the planning discussions themselves, but also in deciding which "moments of gold" should be built upon for their future work together (as expressed via email by the PI to the CFT Expert on August 13, 2023).

With all this in mind, once Mr. R and the CFT Expert respond to all topics in the interview protocol, their responses will be collated as data when reporting the expanded version of this study's findings in a future iteration of this manuscript, in a manner that will aim to make note of the collaborators' level of agreement on both an overall and topic-by-topic scale. More specifically, efforts will made to integrate the responses each collaborator provided for each topic in as clear a manner as possible for the reader, including (a) explicitly identifying any specific parts (i.e., from what is recounted under the "Results" section of this dissertation) that they offered clarifications or corrections for; (b) making note of anywhere that Mr. R or the CFT Expert noted their opinions changing since the planning

discussions, and (c) documenting any time they chose to expand upon their opinions or ideas. At that stage, the only alterations that will be made to their responses will be non-substantive edits for the sake of deidentification, clarity for the reader, or correcting minor grammatical and phrasing errors.

When thinking about future directions upon completion of this study's expansion, one can imagine a chart (see Figure 2 below) denoting this dissertation (i.e., forming ideas for development of a translational framework based on the planning discussions) as a dot labelled "Step 0", and the expanded version of this study as a circle around that dot labelled "Step 0, Expanded" (i.e., in order to denote its empirical rigor and suitability for publication). From there, on the one hand, there is a trajectory of research tied to *the evolution of research involving the multi-iteration community of practice (CoP) at hand between Mr. R and the CFT/LICRA researchers*. More specifically, it is anticipated that the interview protocol will be followed by a series of in-person or Zoom-based synchronous meetings aimed at building upon this study's expanded findings to prepare the translational framework or model (i.e., centered on the "meeting of the minds" established between the learning theories shared in PD1-PD6 and Mr. R's teaching "reality" as shared with the researchers) for integration into Mr. R's classroom setting (i.e., "Step 1"). From there, the teacher and researchers would collectively brainstorm (a) which ideas derived from the framework are essential for the collaboration to consider for integration into the "constraints" of Mr. R's teaching "reality" specifically in mind, from both a scholastic and pedagogical standpoint; (b) what it might look like to empirically test the framework within Mr. R's classroom setting, particularly in relation to what would be logistically feasible to integrate into his existing curriculum; and (c) which learning outcomes might be most suitable for testing the veracity of such a framework, including making note of outcome measures deemed important to include by the CFT Expert and PI. And from there, while it cannot be fully laid out here due to it needing to be collectively determined in coordination with Mr. R and the CFT Expert, the next iteration of the collaboration ("Step 2") would involve implementation of studies aimed at testing the framework (e.g., qualitative analysis of the impact of Mr. R's translation of CFT on a purposive sample of students to more closely monitor their thinking during Web-based learning activities involving LICRA; use of a randomized controlled trial (RCT) with staggered starts to compare the learning effects of Mr. R's integration of CFT/LICRA into his instruction on his students' learning and patterns of thinking under treatment versus control conditions) – in a manner likely to entail revisions to the model within their CoP following each particular "testing" ("Step 3").

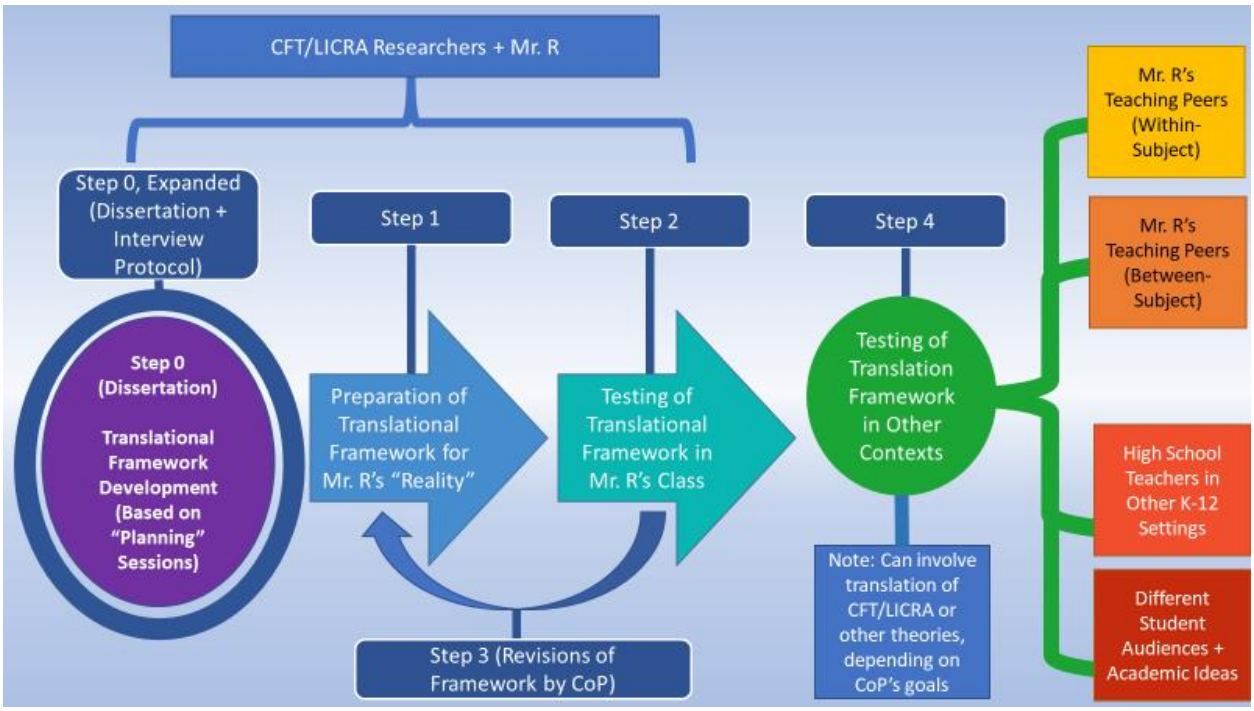

Figure 2. Anticipated Trajectory of Future Research Directions Following Dissertation Study

From there, it is hoped that the framework or model formulated for the purpose of facilitating bidirectional translation of theory into practice in Mr. R's classroom could then be *expanded into other learning contexts involving other scholar-practitioner collaborations with other learning goals in mind* ("Step 4"). First, in order to ascertain how Mr. R's navigation of the "constraints" of his teaching "reality" might be different from his teaching peers *within-subject*, it would be ideal to have the opportunity to see if the learning and/or teaching effects of the translational model developed could be further tested within the classroom settings of the other teachers providing history instruction at Mr. R's high school. However, it would have to be determined which type of community of practice might be best suited to uplift those teachers' unique voices, lived experiences and pedagogical expertise (e.g., collaborating with them as a group that includes Mr. R or on an individual basis), as well as whether the resultant CoP(s) would incorporate CFT/LICRA specifically or other new learning theories instead. Even further, given the impact of Mr. R's "translations" of the CFT catchphrases on the trajectory of the planning discussions in this study, it would be important to make careful note of which resources and preexisting pedagogical strategies those other teachers gravitate to as a part of their instruction (as well as how that might affect the implementation of the translational framework within their classroom settings). Second, in order to get a better sense of what might be replicated by teachers in Mr. R's school *between-subject*, it would be worth which facets of the translational framework might or might not be application to high school classrooms that teach other subject areas (e.g., Science, Reading/Language Arts). And

indeed, assuming those teachers are interesting in translating CFT/LICRA specifically into practice, it would be important to get a sense of the degree to which its application as a learning theory might vary (e.g., LICRA might be utilized by science teachers to help combat misinformation on social media). Third, since (as previously alluded to) education researchers cannot assume that learning effects observed following an intervention in one school will automatically be replicated across all learning contexts, it will be critical to look for opportunities to examine the degree to which such a translational framework's impact might generalize to *other K-12 schools* (e.g., in high schools that are more urban or rural, or that have more limited funding). And indeed, such a step will play a major role in ascertain which facets of the intersection between new learning theories and teachers' understanding of them tend to be fairly consistent across different learning contexts (and across different learning theories), and which facets tend to be more context-dependent. Finally, as the body of research building upon such a translational model gets refined, it will be possible to ask how it might be meaningfully incorporated on a broader scale into learning environments with *different student audiences* (e.g., teachers-in-training completing courses for professional development (PD) purposes) or that are hoping to translate academic ideas with *different theoretical origins and goals* (e.g., Critical Race Theory); but communities of practice must thoughtfully recruit and uplift the voices of researchers and practitioners or teachers with the professional expertise and lived experiences needed to properly apply the framework within those particular contexts.

CONCLUSION

Given how the 21st century so far has been characterized by rapidly changing times characterized by society becoming more complex and harder to predict than ever, education scholars and leaders' increasingly louder calls for students today to develop skills associated with the need to be adaptive and capable of navigating novel situations to survive and professionally succeed as adults, and the tendency of K-12 schools (particularly in the United States) to still reinforce patterns of thinking and learning – when navigating the Web and offline, on standardized assessments and in standards that schools are being held to – that reinforce the very sort of maladaptive "habits of mind" and oversimplified approaches to ill-structured topics and domains of knowledge that are increasingly ill-suited for the world we now all live in. Unfortunately, beyond there being a dearth of standardized assessments or curricular guidelines that are designed to incorporate learning theories from academia (e.g., Cognitive Flexibility Theory) that promote such a necessary shift in thinking and learning, there is no paradigm or framework that currently exists with the primary intention of bidirectionally bringing together new learning theories developed with these changing times in mind (and new learning goals to go with them) and teachers' understanding of said theories in relation to their preexisting pedagogies and the nature of their teaching "realities". And without such framework development, any empirical attempts to enact a collaborative "meeting of the minds" between teachers and researchers to translate theory into practice will be deeply hindered.

With this in mind, in the hopes that it might contribute ideas that meaningfully play a role in guiding future research that is aimed at such translational framework development, this dissertation was aimed at conducting an exploratory case study to begin examining what such an intersection between academic theories or ideas and practitioner-based pedagogical expertise might entail in teacher-researcher communities of practice – namely, by examining how a 9th-grade U.S. History teacher (Mr. R) and two academic researchers specializing in CFT/LICRA came together during an initial series of virtual collaborative planning discussions to engage in such a "meeting of the minds" and begin ascertaining what it might look like to thoughtfully and jointly translate a learning theory designed with these changing times firmly in mind (i.e., CFT/LICRA) into practice within the teacher's particular classroom setting. Over the course of those discussions, areas of "mutual understanding" were discovered between Mr. R and the CFT/LICRA researchers, and design research methodology was thereafter utilized to both inform the trajectory of the discussions themselves and frame the reporting of this study's findings. On the one hand, the collaborators came to recognize their shared appreciation for the importance of teaching students how history is an inherently complex, interconnected and multi-faceted academic subject, as well as for the fact that Mr. R's teaching context could very much be summarized in a similar way. On the other hand, from different perspectives, the teacher and researchers understood how ill-equipped schools like Mr. R's currently are for teaching high school students the "messiness" of the world and its history,

as well as the logistical and systemic hurdles often hindering Mr. R's ability to help his students learn in such a manner as to be cognitively prepared to learn and apply such "messy" knowledge. In response to these shared insights, over the course of the discussions, significant attention was given to both validate the pedagogical strategies that Mr. R was already implementing to add "wrinkles" of complexity into his instruction and begin reflecting upon how the researchers (and CFT as a learning theory, as represented by "shorthand" catchphrases) could help support and complement such efforts. And through Mr. R's attempts to translate the CFT catchphrases, share anecdotes with the researchers from his time teaching and building relationships with his students, design learning activities aimed at exposing students to principles central to CFT in an ecologically valid manner, and contribute to CFT itself as a learning theory through conceiving a new feedback model, this study obtained preliminary evidence that gives credence to the notion that developing a translational framework centered on the intersection of learning theories with pedagogical expertise can be beneficial for scholars and practitioners alike.

It must be reiterated that this study's preliminary analysis of planning for a translational framework is not a research study itself, and thus additional research (including an expansion of the methodological design for this study specifically) will be necessary to develop and empirically test any framework that builds upon the ideas put forth in this dissertation in a systematic, generalizable manner. Beyond this, as noted even before PD1 during an email exchange between the researchers (i.e., via email sent on January 2, 2022), a top priority for this dissertation study was that it was not actually "about an 'intervention'" and Mr. R was "not a subject being examined"; but rather, the focus was on starting to explore what a new paradigm for a bidirectional relationship between academic theory and pedagogical practice might entail, as well as documenting how Mr. R and the CFT/LICRA researchers might grow as professionals, as educators, as learners and as people through forging a collaborative relationship with each other. On the one hand, it could be argued that having this study designated as not being "human subjects research" and not needing to obtain "any approval or oversight from the school or school district" was beneficial for their shared creation of a joint community of practice, since they could thus more freely explore how CFT as a learning theory and Mr. R's teaching principles might complement each other without outside influence (that is, besides those "constraints" interwoven with Mr. R's teaching "reality"). That being said, as denoted by the CFT Expert in later correspondence with the PI on March 9, 2022), such a methodological design made it essential for the collaborators to *not in any way become concerned or fixated* with ascertaining "'how good' anything works" or in evaluating whether or not a particular CFT/LICRA learning activity might be effective within Mr. R's classroom context. On the contrary, what mattered most for this dissertation was to simply "report how things go" as the teacher-researcher collaboration unfolded in as richly descriptive, analytically balanced and thoughtful a manner as possible.

In any event, as this study documented how the teacher and researchers collaboratively discussed the merits, limitations and key considerations involved with translating CFT/LICRA specifically as a learning theory into practice within Mr. R's classroom setting, while also bringing forth promising ideas as a vital first step for informing future research aimed at developing and eventually testing a new translational model for teacher-researcher communities of practice more broadly, its examination of the planning discussions seemed to take on the very sort of ill-structuredness and embracing of complexity that CFT itself calls for. On one level, it was worth noting how the PI, the CFT Expert and Mr. R explicitly strove to build off the "meeting grounds" they discovered between their different but potentially complementary perspectives to brainstorm potential ways that CFT/LICRA might align with what Mr. R was already striving to accomplish as an educator, even as the learning theory also emerged as a "cover" for his navigation of teaching challenges and a "tool in the toolbox" for navigating his classroom setting. On another level, as the collaborators exchanged anecdotes, dissected potential situations that might make CFT more or less useful for Mr. R's pedagogical goals, and made space for Mr. R's self-initiated efforts to professionally apply what he learned from exposure to the learning theory (albeit during the pre-finals "review stage" of his school's academic year), they appeared to begin approaching *their shared collaborative space itself* in an increasingly "CFT-ish" manner as well, including thoughtfully considering other collaborators' perspectives, reflexively building upon ideas previously mentioned in a more interconnected manner, and refining their brainstorming to more consciously centralize the "constraints" that Mr. R had to (and would need to) navigate as a high school teacher moving forward. And in that sense, over time, their planning discussions appeared to become less anchored to the abstract and theoretical in terms of what they wished to do, and instead more focused on brainstorming what they might need to do to translate CFT/LICRA for the "messiness" of the learning context at hand. Finally, as the intersectional "meeting" of CFT as a learning theory and Mr. R's understanding of CFT in relation to his preexisting teaching strategies and pedagogical mindset played out in real time, building upon Spiro's aforementioned sentiment to the PI (via email on January 16, 2022), a new "interacting part" of how CFT might be understood as a learning theory appeared to emerge as a result of Mr. R's insights – in a manner that is highly relevant not just for CFT as a "single (and) holistic" concept or any theory in particular, but in justifying the development of a new translational framework for the purpose of offering an roadmap for using teacher-researcher collaboration to better understand and apply theories of learning in general.

If this dissertation study's findings have successfully addressed the primary question it put forth (i.e., taking a first step in identifying ideas that might be meaningful for informing future research centered on the development of a framework aimed at promoting a new bidirectional translation process), then that what has been learned from the initial collaborative planning discussions between Mr. R, the CFT Expert and the PI could provide important insights for ascertaining what might best support the

translation of CFT/LICRA into authentic classroom settings to help students more deeply learn ill-structured subjects like U.S. History (both within Mr. R's teaching context and more broadly). But beyond that, it is hoped that the findings of this study can help fill a significant void currently found in educational institutions (particularly in K-12 schools across the United States) – namely, the need to more effectively translate new learning theories for the purpose of better instilling students today with the cognitive tools and learning mindset needed to navigate the novel situations they are likely to face. Even as the world has become harder to predict in terms of the obstacles one might face on a day-to-day basis following the onset of COVID-19, the detrimental impact of hyperpolarization, "echo chambers" and misinformation has become just as influential on students' development, and just as impactful on society at large, as the historical events such phenomena are reacting to – a trend all too obvious given the recent emergence of conspiracy theories and "unfounded, fantastical claims" mere minutes after the attempted assassination of former President Donald Trump (Klepper & Swenson, 2024, n.p.). Nevertheless, even as cultural change rapidly unfolds and the need for media literacy is more urgent than ever, if studies like this dissertation can help pave the way for the development of a new research paradigm that is centered on forging a "meeting of the minds" that can better bring together timely learning theories like CFT from academia and the "realities" that practitioners must strive to navigate on a day-to-day basis, then teacher-researcher collaborations might be able to be the harbinger of a new era of translating theory into practice – one that guides researchers, empowers teachers and equips students with the understanding and outlook needed to learn, grow and ultimately survive in our increasingly complex, novel and ever-changing world.

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APPENDIX A: ALIGNMENT OF SUB-QUESTIONS AND DATA USED IN STUDY

Sub-Question (SQ)	Main Sources of Data Used to Address SQ
1. What were the initial mindsets of the 9th-grade U.S. History teacher and CFT/LICRA researchers entering the collaboration, particularly in relation to its central goal of facilitating the teacher's efforts to incorporate CFT/LICRA principles into his classroom instruction?	• Grounded and theory-based qualitative analysis of transcript data from planning discussions over Zoom between collaborating parties, particularly during **Stage 1** (i.e., **PD1**) • Integration of supplementary materials, including (but not limited to) relevant correspondence outside the discussions (e.g., email, via Zoom), any relevant materials shared by the teacher and/or CFT/LICRA researchers during or outside of the planning discussions, and any relevant "journaling" entries or notes completed by the teacher
2. Across the collaboration, what discrepancies were identified and discussed by the collaborators between how they felt U.S. History should be taught in K-12 classroom settings (i.e., in relation to CFT/LICRA) and the ways that U.S. History is "traditionally" taught in today's society (including within the teacher's high school)?	• Grounded and theory-based qualitative analysis of transcript data from planning discussions over Zoom between collaborating parties, particularly during **Stage 2** (i.e., **PD2/3**) • Integration of supplementary materials, including (but not limited to) relevant correspondence outside the discussions (e.g., email, via Zoom), any relevant materials shared by the teacher and/or CFT/LICRA researchers during or outside of the planning discussions, and any relevant "journaling" entries or notes completed by the teacher

Table 3. Listing of Main Sources of Data Used to Address Sub-Questions for Study

Table 3 (cont'd)

Sub-Question (SQ)	Main Sources of Data Used to Address SQ
3. What considerations or concerns were raised by the collaborators when discussing how to incorporate CFT/LICRA principles within the "constraints" of the teacher's "reality"?	• Grounded and theory-based qualitative analysis of transcript data from planning discussions over Zoom between collaborating parties, particularly during **Stage 3** (i.e., **PD4**) • Integration of supplementary materials, including (but not limited to) relevant correspondence outside the discussions (e.g., email, via Zoom), any relevant materials shared by the teacher and/or CFT/LICRA researchers during or outside of the planning discussions, and any relevant "journaling" entries or notes completed by the teacher
4. How did the collaboration evolve over time, particularly in response to insights reported by the teacher in relation to his initial efforts to incorporate CFT/LICRA principles into his classroom instruction (i.e., as reported to the researchers during the planning discussions)?	• Grounded and theory-based qualitative analysis of transcript data from planning discussions over Zoom between collaborating parties, particularly during **Stage 4** (i.e., **PD5/6**) • Integration of supplementary materials, including (but not limited to) relevant correspondence outside the discussions (e.g., email, via Zoom), any relevant materials shared by the teacher and/or CFT/LICRA researchers during or outside of the planning discussions, and any relevant "journaling" entries or notes completed by the teacher

Table 3. Listing of Main Sources of Data Used to Address Sub-Questions for Study

APPENDIX B: IRB LETTER CLEARING PLANNING DISCUSSIONS AS "NOT RESEARCH"

DETERMINED NOT "RESEARCH"

Revised Common Rule

January 17, 2022

To: Ian Clemente

Re: **MSU Study ID:** STUDY00007105
Principal Investigator: Ian Clemente Determination Date: 1/17/2022

Title: Preparation for Integration of Learning Based on Cognitive Flexibility Theory and Web Searches that Emphasize Open and Iterative Search Processes (Rather than Retrieval of Facts) Into a High School U.S. History Teacher's Classroom

The activity described in this submission was determined not to be "research" as defined by the Common Rule as codified in the U.S. Department of Health and Human Services (DHHS) regulations for the protection of human research subjects.

Definition of Research

For DHHS, "*Research* means a systematic investigation, including research development, testing, and evaluation, designed to develop or contribute to generalizable knowledge. Activities that meet this definition constitute research for purposes of this policy, whether or not they are conducted or supported under a program that is considered research for other purposes. For example, some demonstration and service programs may include research activities. For purposes of this part, the following activities are deemed not to be research:

1) Scholarly and journalistic activities (e.g., oral history, journalism, biography, literary criticism, legal research, and historical scholarship), including the collection and use of information, that focus directly on the specific individuals about whom the information is collected.
2) Public health surveillance activities, including the collection and testing of information or biospecimens, conducted, supported, requested, ordered, required, or authorized by a public health authority. Such activities are limited to those necessary to allow a public health authority to identify, monitor, assess, or investigate potential public health signals, onsets of disease outbreaks, or conditions of public health importance (including trends, signals, risk factors, patterns in diseases, or increases in injuries from using consumer products). Such activities include those associated with providing timely situational awareness and priority setting during the course of an event or crisis that threatens public health (including natural or man-made disasters).
3) Collection and analysis of information, biospecimens, or records by or for a criminal justice agency for activities authorized by law or court order solely for criminal justice or criminal investigative purposes.
4) Authorized operational activities (as determined by each agency) in support of intelligence, homeland security, defense, or other national security missions." [45 CFR 46.102(l)]

Determination

<u>This study has no systematic design and will not contribute to generalizable knowledge, therefore it is not defined as human subject research.</u>

Hence, the activity does not involve research.

Therefore, the federal regulations for the protection of human subjects would not apply to this activity and Michigan State University (MSU) Institutional Review Board (IRB) approval is not needed to proceed. However, please note that while MSU IRB approval is not required, other federal, state, or local regulations or requirements or ethical or professional standards may still be applicable based on the activity.

Modifications: If any of the activities described in this submission change, please contact the IRB office as the activity may involve human subject research and require IRB approval. For example, this determination is not applicable to activities that may be regulated by U.S. Food & Drug Administration (FDA), such as those involving drugs, medical devices, human food additives, color additives, electronic products, or any other test articles regulated by the FDA.

Modifications to Funding: Changes in funding may alter this determination. For example, MSU IRB review and approval is required if MSU receives an award through a grant, contract, or cooperative agreement directly from a federal agency, even where all non-exempt research involving human subjects are carried out by employees or agents of another institution. In addition, the new funding source may have additional or different requirements.

For More Information: See HRPP Manual Section 4-3, Determination of Human Subject Research (available at hrpp.msu.edu).

Contact Information: If we can be of further assistance or if you have questions, please contact us at 517-355-2180 or via email at IRB@msu.edu. Please visit hrpp.msu.edu to access the HRPP Manual, templates, etc.

APPENDIX C: CONSENT FORM TO BE GIVEN TO TEACHER IN FUTURE RESEARCH

Teacher Informed Consent

Study Title: First Steps for Teaching Adaptiveness to Novel and Complex Situations in a Post-Pandemic World: Exploring Integration of Cognitive Flexibility and Web Searches that Emphasize Open and Iterative Search Processes (Rather than Retrieval of Facts) Into a High School U.S. History Teacher's Classroom

Researcher and Title: Mr. Ian Clemente, ABD

Department and Institution: Department of Counseling, Educational Psychology, and Special Education (CEPSE), Michigan State University

Contact Information: Ian Clemente […]

BRIEF SUMMARY

You are being asked to participate in a research study. Researchers are required to provide a consent form to inform you about the research study, to convey that participation is voluntary, to explain risks and benefits of participation including why you might or might not want to participate, and to empower you to make an informed decision. You should feel free to discuss and ask the researchers any questions you may have about the study.

In order to better explore the process of meaningful translation education research and theory into practice, you are being asked to take part as a collaborator in a research study aimed at examining the process of education researchers and a high school teacher (you) collaborating to merge their respective perspectives to figure out which pedagogical strategies centered around cognitive theories of learning (specifically, Cognitive Flexibility Theory and a mode of CFT-based learning designed for the Web: Learner-Initiated Complex, Reciprocally Adaptive Web searching) might be beneficial for promoting deeper student learning and thinking within your classroom setting. Your participation in this study will take place over several weeks, during which time you will be asked to complete an interview protocol and take part in a series of online interactions (e.g., potentially via a series of email threads that correspond with particular topics on a platform like Microsoft Outlook) that will be focused on reflecting on a series of collaborative planning sessions that took place between you and the researchers last year. It is hoped that you will be able to share your perspective about CFT/LICRA as a learning theory, as well as your experiences integrating the theoretical framework into your pedagogy and instruction.

The most likely risks of participating in this study could be you feeling uncomfortable or uncertain regarding which experiences in your classroom to share during the discussion forum-based interactions planned for this study (as well as how to discuss those experience in a manner that meets the criteria laid out by the researchers).

The potential benefits to you for taking part in this study are having the opportunity to brainstorm potential solutions to teaching-related challenges that you might be facing in a supportive collaborative space with education researchers that is centered on your lived experience as an educator. In addition, there may be opportunities for future collaboration, both within and beyond scholarly settings, between the parties involved in this study should all involved believe that to be a beneficial avenue to pursue following this study. Finally, it is hoped that exposure to the cognitive learning theories that will be discussed might equip you with information, and inspire instructional strategies, that are able to elicit

benefits in thinking, attitudes and behavior towards complex topics within your classroom – in a manner that could help you promote academic, intellectual, and/or personal growth over time.

PURPOSE OF RESEARCH

The purpose of this study is to analyze the interactions that take place within the collaboration between you and the researchers, in order to systematically examine, for a single difficult case of applying learning theories with very different approaches to knowledge and learning than is found in traditional teaching, the nature of how collaborations between academic learning theorists/researchers and teachers can potentially unfold over time. We are hoping that such an investigation can provide insights within a dimension of translating theory into practice that is too often taken for granted (i.e., centering teacher voice in such efforts), in a manner that can shed light on how learning theories like CFT might be more meaningfully introduced into the curriculum provided for students within authentic K-12 educational settings. We are also interested in building off the unique features of your learning environment and pedagogical practices, and will thus ask for your perspective on the potential effectiveness of introducing a cognitive learning theory like CFT/LICRA into your existing US History instruction.

WHAT YOU WILL BE ASKED TO DO

During this study, you will be asked to complete an interview protocol and take part in a series of conversations between yourself and two CFT/LICRA researchers, which will take place in an online setting over several weeks. It is important to explicitly note that by participating in this study, you are consenting to the use of transcripts obtained from six prior planning sessions from January-June 2022 conducted with all parties included in this study (e.g., using excerpts of transcripts from those sessions, as well as other related correspondence, to write the prompts that will be shared in the interview protocol), as well as the potential use of relevant supplementary materials shared by the aforementioned parties (yourself included) during that period. Emphasis will be placed on (a) discussing what you and/or the researchers feel might be needed to facilitate and support your efforts to potentially incorporate your use of cognitive theories of learning like CFT/LICRA into your classroom instruction; and (b) capturing what has occurred in your classroom from your perspective in a journalistic and anecdotal manner, including what you have observed during your teaching efforts (e.g., “Here’s how my class went”, “Here’s how the assignments went, with some of my interesting observations”, etc.). However, you are asked to not give identifiable information about your students or share any of their direct work. All interactions that occur for the purposes of this study, as well as any relevant correspondence related to those discussions (e.g., email), will be recorded and/or archived in order to more meaningfully document and analyze how the collaboration unfolds.

POTENTIAL BENEFITS

As alluded to before, it is anticipated that this study will be able to serve as the first stage of a multi-iteration research project between the collaborators involved in this study (yourself included), in a manner that can provide a long-term supportive collaborative space that is centered on your lived experience as an educator while also (should you wish to pursue them) offering opportunities for professional development (e.g., co-authorship on any journal articles written based on the study’s findings). Beyond this, we hope that, in the future, other people (e.g., K-12 students, teachers and/or administrators) might benefit from this study because of its efforts to explore what occurs when cognitive theories of learning like CFT/LICRA are translated for authentic K-12 classroom settings, as well as important considerations for developing meaningful and ethical teacher-researcher collaborations.

POTENTIAL RISKS

There might be some minor discomfort involved with ascertaining what experiences or artifacts you wish to share (as well as how to share them), in order to present information that can be incorporated into the study as a whole (e.g., discussing what was said or done by specific students in a deidentified manner). However, it is worth emphasizing that this study is centered on developing a collaborative environment that places all individuals (yourself included) on equal footing, with emphasis placed on reciprocal influence and mutual benefit. In addition, no identifiable data from your students will be shared when reporting this study's findings at any time (nor will you be asked to share such information at any time), and the discussion forum will be strictly focused on documenting your lived professional experiences as a high school teacher and supporting your possible integration of CFT/LICRA into your normal teaching practices, rather than any of your (or the researchers') personal, legal or economic circumstances. Therefore, no reasonably foreseeable risks are anticipated due to your participation.

PRIVACY AND CONFIDENTIALITY

All consent forms and collected data will be kept for a period of five years. In turn, consent forms, all materials or artifacts shared during the collaborative meetings, any digital correspondence and all video/audio recordings will be stored on a password-protected laptop, storage platform and/or digital device. Consent forms and any raw data or recordings collected for this study will only be viewed by the researchers conducting this study, and in no way will your identity be obtainable through the manuscript for the study itself or this consent form. Although data obtained will not be directly used for other purposes than this research, the information collected during this study may be (a) stripped of identifiers and used in future presentations; or (b) utilized to inform future collaborative efforts undertaken by those collaborators involved in this study. The name of your students will never be used in any written publication of the data from this study, and your name will not be used unless it is with the intention to incorporate you as a co-author for submission of this study to journals or other avenues of publication. The data will be accessible to the researchers and HRPP, and will be stored in the possession of the researcher above.

Your rights to participate, say no, or withdraw

As noted above, participation in this study is completely voluntary. Thus, you have the right to say no to participate in the research, you can stop at any time after it has already started, and there will be no consequences if you stop and you will not be criticized for discontinuing your participation.

COSTS AND COMPENSATION FOR BEING IN THE STUDY

There are no anticipated costs to you that are anticipated during this study, with the possible exception of costs incurred involving sharing of materials you wish to share during the collaborative discussions. During the study itself, you will not receive money or any other form of compensation for participation in this study. However, you will be credited as a co-author for any publications resulting from the findings obtained in this study if you wish.

Contact Information

If you have concerns or questions about this study, such as scientific issues, how to do any part of it, or to report an injury, please contact the researcher:

[…]

Alternatively, you are welcome to contact the researcher's advisor about any concerns you may have:

[…]

If you have questions or concerns about your role and rights as a research participant, would like to obtain information or offer input, or would like to register a complaint about this study, you may contact, anonymously if you wish, the Michigan State University's Human Research Protection Program at 517-355-2180, Fax 517-432-4503, or e-mail irb@msu.edu or regular mail at 4000 Collins Rd, Suite 136, Lansing, MI 48910.

Documentation of Informed consent.

Your signature below means that you voluntarily agree to participate in this research study as described above.

_____ _____

Signature Date

Your signature below means that you voluntarily agree for your identity to be disclosed in reports and/or presentations that are given with the goal of reporting the findings obtained from this particular study.

_____ _____

Signature Date

You will be given a copy of this form to keep.

APPENDIX D: AGENDA SHARED FOR FIRST PLANNING DISCUSSION (PD1)

(Abridged) Agenda for Preliminary Collaborative Meeting –

January 2, 2022

I. Brief Post-Holiday Check-In
II. Suggested Changes to Agenda
III. Preliminary Points of Consideration
    a. Preexisting Teaching Beliefs and Pedagogical Framework Underpinning Teaching of 9th grade U.S. History
    b. Initial Understanding(s) about CFT/LICRA from Teacher's Perspective
    c. Initial Understanding about Teaching CFT/LICRA to High School/K-12 Students Held by CFT Expert and Primary Investigator or PI
    d. Mutual Understandings Found between Teacher and CFT Expert/PI
IV. Discussion of Teacher's Current Learning Context/Class Setting
    a. Nature of School-Wide Instruction
    b. Nature of Teacher's Class-Specific Instruction
    c. Current Instructional Goals of Teacher
    d. Anticipated Constraints of Class Setting in Winter 2022 (e.g., likelihood of fully online learning, attendance required)
    e. Available Resources within Class Setting
V. Initial Presentation of CFT/LICRA from CFT Expert/PI to Teacher (w/ relevant literature noted)
VI. Discussion of Logistics of Teacher/Researcher Collaboration for Dissertation Study
    a. Design
    b. Procedure
        i. Nature of Discussions
        ii. Materials Shared
    c. Considerations to Address
        i. What details are needed to maximize benefits and more fully flesh out focus of collaborative discussions?
        ii. What considerations need to be accounted for to facilitate integration of discussions into teacher's plans?
        iii. What concerns exist about the potential alignment of CFT/LICRA principles with existing curriculum?
VII. Plans for Next Meeting
    a. Date/Time of Next Meeting
    b. Goals of Next Meeting
    c. Steps to be Completed Before Next Meeting
        i. Tasks for Teacher
        ii. Tasks for CFT Expert/PI

APPENDIX E: AGENDA SHARED FOR SECOND PLANNING DISCUSSION (PD2)

(Abridged) Agenda for Second Preliminary Collaborative Meeting –

(January [16], 2022)

I. Recap of Last Discussion/Suggested Changes to Agenda
II. Preliminary Points of Consideration (Continued from Last Discussion)
    a. Initial Understanding about Teaching CFT/LICRA to High School/K-12 Students Held by CFT Expert and Primary Investigator or PI
    b. Mutual Understandings Found between Teacher and CFT Expert/PI
III. Discussion of Teacher's Current Learning Context/Class Setting
    a. Nature of School-Wide Instruction
    b. Nature of Teacher's Class-Specific Instruction
    c. Current Instructional Goals of Teacher
    d. Anticipated Constraints of Class Setting in Winter 2022 (e.g., likelihood of fully online learning, attendance required)
    e. Available Resources within Class Setting
IV. Initial Presentation of CFT/LICRA from CFT Expert/PI to Teacher (w/ relevant literature noted)
V. Plans for Next Meeting
    a. Date/Time of Next Meeting
    b. Goals of Next Meeting
    c. Steps to be Completed Before Next Meeting
        i. Tasks for Teacher
        ii. Tasks for CFT Expert/PI

APPENDIX F: AGENDA SHARED FOR THIRD PLANNING DISCUSSION (PD3)

(Abridged) Agenda for Third Preliminary Collaborative Meeting –

(February 24, 2022) – 1 hour, maybe a bit over

I. Recap of Last Discussion/Suggested Changes to Agenda
II. Preliminary Points of Consideration (Continued from Last Discussion)
    a. Teacher's Thoughts about CFT Catchphrases and Impact in Classroom (Progress on Journaling)?
        i. Additional CFT Catchphrase to Add: related to *multiplicity* (e.g., the existence of multiple possible answers; the value of looking at things from multiple perspectives; etc.).
    b. Updates about Teacher's Current Learning Context/Class Setting (Note: Can Skip if Better to Share Over Email)
        i. Nature of School-Wide Instruction
        ii. Nature of Teacher's Class-Specific Instruction
        iii. Current Instructional Goals of Teacher
        iv. Constraints of Class Setting in Winter 2022 (e.g., likelihood of fully online learning, attendance required)
        v. Available Resources within Class Setting
III. Follow Up About Insights Found in Discussion Data
    a. Meeting points of alignment (critical for what (the teacher) will be thinking about for teaching with CFT lens):
        i. Connectedness
        ii. Looking "below the surface"
        iii. Working within the constraints of the teaching environment
        iv. Use of historical examples
        v. Interpersonal relationship management approach, use of Maslow's Hierarchy (psychological)
        vi. No formal "pet" learning theory, but clear anti-essentialist/Platonist mindset for teaching
        vii. Acknowledgment of "the real world and mess" (in relation to epistemology/historical topics)
        viii. Sympathy for CFT due to "how the world operates", and "how the world is" often being "contrary to how you're asked to teach about the world"…"real-world" relevance
    b. Questions to Discuss:
        i. How can we teach multiple sides of historical topics (especially if they are emotionally charged) when one view might not be liked or agreed with by the parents?
            1. In turn, would it help to explicitly disarm the notion that one view is right and one is wrong, and let students defend/explore different ways of seeing the issue (i.e., with (teacher) not explicitly endorsing one opinion or the other as the instructor)? [Note: from 1/25 meeting b/w (researchers)]

ii. Building off slightly different views of "concrete" thinking you each had, how can we manage “concrete thinking” in a manner that avoids the emergence of “black and white” thinking?
iii. Discussion of [researcher’s] suggested LICRA exercise using concept from history unit (e.g. capitalism)
1. Any “Open” Concepts from Units Suitable for Exploration during LICRA Web Learning Activity?

IV. Discussion of Logistics of Teacher/Researcher Collaboration for Dissertation Study
a. Design
b. Procedure
i. Nature of Discussions (e.g., Number/Date of Sessions, Goals for Remaining Sessions)
ii. Materials Shared (e.g., developed by Teacher, offered by CFT Expert/PI)
iii. Brainstorming of Activities Given Current Constraints
iv. Reporting of Progress/Implementation of CFT/LICRA (e.g., Check-In/Updates Between Discussions via Email?)
c. Considerations to Address
i. What details are needed to maximize benefits and more fully flesh out focus of collaborative discussions?
ii. What considerations need to be accounted for to facilitate integration of discussions into teacher’s plans?
iii. What concerns exist about the potential alignment of CFT/LICRA principles with existing curriculum?

V. Plans for Next Meeting
a. Date/Time of Next Meeting
b. Goals of Next Meeting
c. Steps to be Completed Before Next Meeting
i. Tasks for Teacher
ii. Tasks for CFT Expert/PI

APPENDIX G: AGENDA USED FOR FOURTH PLANNING DISCUSSION (PD4)

(Abridged) Agenda for Collaborative Meeting with Mr. R/CFT Expert –

(May 5, 2022, 5:30-7:15 PM)

I. Greetings/Checking In

II. Updates from Mr. R Regarding Classroom (e.g., "constraints of practice", students' motivation, perceived benefits of CFT)
   a. Note: Is there any journaling or materials that Mr. R has to share with us?

III. PI's Discussion of Points of Consideration for Implementation of CFT/LICRA
   a. Goals/Timeline of Dissertation
      i. For Main Discussion #1, goal is to use mutual understandings discovered in collaboration so far to brainstorm strategies for teacher to teach CFT/LICRA principles and/or integrate them into his pedagogical framework (i.e., for classroom instruction in 1-2 U.S. History units *following* this discussion and before the next discussion)
      ii. Also noting goals for development of teacher-research collaboration from PI's perspective in developing study
   b. Recapping "Meeting Points" from Preliminary Discussions (Note: It is quite possible that more will be discovered later.)
   c. Recap of CFT "Cognitive Values" (and "Catchphrases") Shared with Mr. R by PI/CFT Expert
      i. Also noting importance of four-stage model for changing worldview that CFT builds off (Spiro, et al., 2019)
   d. Brief Overview of Main Ideas of LICRA Web Searching (+ Considerations for Data Collection)
   e. Presentation of Some Suggested Learning Activities for CFT/LICRA (in relation to teaching constraints/dissertation goals):
      i. Can facilitate concerns raised before (e.g., teaching students to consider multiple perspectives, promoting concrete thinking that avoid reductivism/"black and white" reasoning, use of "open" concepts)

IV. Brainstorming of Ideas for Teacher's Initial Cycle of Implementing CFT/LICRA
   a. Integrating principles into existing instruction taught in classroom
   b. Integrating principles into Mr. R's pedagogy (Note: which strategies being used by Mr. R seem to align already with CFT)
   c. What might make CFT/LICRA easier/harder to remember, and when they might be more/less useful
   d. Possible materials that could facilitate implementation of CFT/LICRA for Mr. R (in relation to "shared vision")

V. Plans for Next Meeting
   a. Date/Time of Next Meeting
   b. Goals of Next Meeting
   c. Steps to be Completed Before Next Meeting
      i. Tasks for Teacher
      ii. Tasks for CFT Expert/PI

APPENDIX H: AGENDA USED FOR FIFTH PLANNING DISCUSSION (PD5)

(Abridged) Agenda for Collaborative Meeting with Mr. R/CFT Expert –

(May 17, 2022, 5:00-6:00 PM)

I. Greetings/Checking In

II. PI's Discussion of Points of Consideration for Implementation of CFT/LICRA
   a. Goals/Timeline of Dissertation
      i. For Main Discussion #2, goal is to provide "mid-point" chance for teacher to report on initial attempt to use strategies to teach CFT/LICRA principles and/or integrate them into his pedagogical framework, while also sharing any insights from initial report that can inform remaining discussions included in this collaboration
      ii. i.e., for classroom instruction in 1-2 U.S. History units *following* this discussion and before the next discussion

III. Initial Report from Teacher about Implementation of CFT/LICRA Into Classroom Setting
   a. Impact of collaborative discussions on:
      i. Strategies initially used– overt, covert, and/or integrative – to teach CFT/LICRA principles to his students
      ii. Strategies initially used to incorporate CFT/LICRA-centered principles into own pedagogical framework
   b. Which strategies are identified by the teacher and/or CFT/LICRA researchers as being more or less successful?
      i. What does the teacher note as being easier or harder about keeping CFT/LICRA principles in mind?
      ii. What does the teacher note CFT/LICRA principles as being more or less useful for?
   c. What anecdotes and/or materials are shared by the teacher (e.g., lesson plans, journaling) and/or researchers?
      i. What materials shared are identified as being most helpful toward developing mutual understandings and shared vision for introducing CFT/LICRA instruction within the teacher's classroom setting?

IV. Brainstorming of Ideas for Future Discussions and/or Teacher's Next Cycle of Implementing CFT/LICRA
   a. What insights are gained by the teacher and/or CFT/LICRA researchers after discussing the efficacy of the initial strategies used by the teacher to incorporate CFT/LICRA-centered principles into his instruction/pedagogical framework?
   b. How does the reporting of these findings impact the focus of the collaborative discussions (i.e., discussions that occur after the mid-point debriefing session) between the teacher and the CFT/LICRA researchers?
      i. Any changes to focus or nature of remaining collaborative discussions?
      ii. How might the teacher Integrate CFT/LICRA principles into his instruction/pedagogical framework different, in response to what occurred in the classroom setting during the initial cycle?
         1. What could be done to make CFT/LICRA easier for the teacher to remember?
         2. What could be done to make CFT/LICRA more useful for the teacher?

3. What possible materials that could facilitate implementation of CFT/LICRA?

V. Plans for Next Meeting
   a. Date/Time of Next Meeting
   b. Goals of Next Meeting
   c. Steps to be Completed Before Next Meeting
      i. Tasks for Teacher
      ii. Tasks for CFT Expert/PI

APPENDIX I: AGENDA USED FOR SIXTH PLANNING DISCUSSION (PD6)

(Abridged) Agenda for Collaborative Meeting with Mr. R/CFT Expert –

(June 9, 2022, 5:00-6:00 PM)

I. Greetings/Checking In

II. PI's Discussion of Points of Consideration for Implementation of CFT/LICRA
   a. Goals/Timeline of Dissertation
      i. For Main Discussion #3, goal is to build upon "mid-point" check in by discussing teacher's second attempt to integrate CFT/LICRA using "mid-point" adjustments identified, while also exploring how any insights gained in the collaboration from his initial report informed his subsequent attempts to implement CFT/LICRA in his class
      ii. i.e., for classroom instruction in 1-2 U.S. History units *following* second collaborative discussion (Note: Mr. R requested postponing of third meeting for one week, in order to have more to report about his efforts)

III. Second Report from Teacher about Implementation of CFT/LICRA Into Classroom Setting
   a. Impact of collaborative discussions **(including insights gained during "mid-point" discussion)** on:
      i. Strategies initially used– overt, covert, and/or integrative – to teach CFT/LICRA principles to his students
      ii. Strategies initially used to incorporate CFT/LICRA-centered principles into own pedagogical framework
      iii. **Note: What differences are notable between the teacher's first/second attempts to implement CFT/LICRA?**
   b. **In 2nd cycle**, which strategies are identified by the teacher and/or CFT/LICRA researchers as being more or less successful?
      i. What does the teacher note as being easier or harder about keeping CFT/LICRA principles in mind?
      ii. What does the teacher note CFT/LICRA principles as being more or less useful for?
      iii. **Note: What differences are notable between the teacher's first/second attempts to implement CFT/LICRA?**
   c. **In 2nd cycle**, what anecdotes and/or materials are shared by the Mr. R (e.g., lesson plans, journaling) and/or researchers?
      i. What materials shared are identified as being most helpful toward developing mutual understandings and shared vision for introducing CFT/LICRA instruction within the teacher's classroom setting?
      ii. **Note: What differences are notable between the teacher's first/second attempts to implement CFT/LICRA?**

IV. Points of Consideration for Discussing Teacher's Second Cycle of Implementing CFT/LICRA
   a. What insights were gained by the teacher and/or CFT/LICRA researchers after discussing the efficacy of the initial strategies used by the teacher to incorporate CFT/LICRA-centered principles into his instruction/pedagogical framework?
      i. E.g., any shifts noteworthy in what collaborators feel the focus of the collaborative discussions should be?

ii. How did the teacher Integrate CFT/LICRA principles into his instruction/pedagogical framework differently following what occurred in the classroom setting during the initial cycle (and how was it discussed)?

b. Expectation is that LICRA has already begin in Mr. R's class, so look for report on how things went (particularly for LICRA and anything CFT-ish), as well as good anecdotes…then put our heads together to see if there's any follow-up possible based upon that (e.g., if there were difficulties for students to change search terms)
    i. Follow up discussion should be centered on both pluses (how to build upon positive trends and take them one step further), and minuses (how to respond to setbacks/challenges to make the instruction better)
    ii. Also place emphasis on how implementing CFT/LICRA has felt for Mr. R, and if anything has changed over time
    iii. Should be centered on recognition that anything added by Mr. R is difficult, but that it'd make a big difference
c. For catchphrases (as well as his translations of CFT):
    i. (1) ask what he's done with CFT; (2) ask how it went; (3) maybe see if discussion of specific catchphrases jogs memory, and (4) with CFT Expert leading, see if there's anything we can do for positive/negatives (in relation to anything that he plans to do in his class)
d. Place emphasis on noting shifts in both how Mr. R teaches in classroom and his pedagogical framework, including:
    i. (1) going "surface to deep" thinking, both when understanding CFT and brainstorming pedagogical strategies
    ii. (2) examining his understanding of CFT catchphrases, their interconnectedness and how that might lead to a deepening of his criticisms of the existing standards in education (e.g., lack of emphasis on how they are ecologically interconnected in relation to "the doing" of teaching in the classroom)
e. Take time to brainstorm with Mr. R regarding what might be doable in his classroom setting before school year wraps up

V. Plans for Next Meeting
a. Date/Time of Next Meeting
b. Goals of Next Meeting
c. Steps to be Completed Before Next Meeting
    i. Tasks for Teacher
    ii. Tasks for CFT Expert/PI

APPENDIX J: FIRST DRAFT OF CFT "COGNITIVE VALUES" SHARED WITH MR. R

List of CFT "Cognitive Values" Centered on Developing "Adaptive Worldview" for Developing Readiness to Adapt Knowledge to Novel and Complex Problem Solving

CFT Theme #1: Flexible storage of **multiple conceptual frameworks/relations** when forming one's knowledge (i.e., rather than using "one size fit all" structure for one's understanding)

- Catchphrase: **"It's Not That Simple!"**
- Corresponding Cognitive Values:
    1. Be open to **multiple conceptual relations** (e.g., analogies, schemas, prototypes) to promote **flexible and open knowledge representation** (rather than relying on a single "rigid" understanding a concept, since that can lead to oversimplification)
    2. Avoid rigidity in understanding the **limitless range of possibilities for one's use of knowledge** (i.e., in new contexts, for new purposes, in new situations)
- Example: How has "freedom" or "justice" been defined by different people in history?

CFT Theme #2: Prioritizing **"case-centeredness"** when learning about ill-structured topics (i.e., avoiding oversimplification in favor of embracing complexity and case-by-case variability)

- Catchphrase: **"It Depends!"**
- Corresponding Cognitive Values:
    1. Embrace the **"rich" and multifaceted nature** of specific situations or contexts (cases = greater than sum of its parts), rather than relying on abstract concepts or that overlooks how different situational factors might shape their application
    2. Increase **attunement to differences between "cases"**, while also decreasing bias towards seeing (or seeking out) similarities and minimizing differences
    3. Be open to **revisiting earlier "cases" within new contexts** in a nonlinear manner (has potential to bring out new ways of understanding them)

CFT Theme #3: Embracing **contextual/situational dependency** for assembling and adaptively applying one's prior knowledge (i.e., in order to have use of knowledge fit situational needs)

- Catchphrase: **"Think of the Context!"**
- [Corresponding] Cognitive Values:
    1. Rather than hoping for predictability in a situation, develop a mindset that plans for **unpredictability, irregularities, contingencies, indeterminateness**, etc.
    2. As a rule of thumb, look for **context dependency** over context independence (i.e., one's proper use of knowledge largely depends on what situation involves)
    3. For problem solving, utilize **situation-adaptive assembly of one's prior knowledge from different arrays of experiences** (rather than depending on retrieval of "intact" knowledge structures/procedures from one's LTM)

APPENDIX K: REVISED LIST OF CFT "COGNITIVE VALUES" SHARED WITH MR. R

List of CFT "Cognitive Values" Centered on Developing "Adaptive Worldview" for Responding to Novelty and Complexity:

CFT Theme #1: Embrace the complexity of concepts, including the feature of interconnectedness between concepts

- When forming knowledge, learners should be open to **multiple conceptual frameworks or perspectives** when trying to understand the complexity of a topic (rather than using a "one size fits all" structure). This is important for novice learners to recognize early on, but the teacher should make sure this approach doesn't get too overwhelming. In turn, be open to **revisiting concepts you've already learned within new contexts**, since that has the potential to help you understand them in new and deeper ways.
    - **Example:** How has "freedom" or "justice" been defined across history? There have been multiple **conceptual relations** (e.g., analogies, schemas) used to describe what freedom and/or justice look like across different contexts, as well as different examples (or prototypes) of actors in history who have strived for them in different ways.
    - **Catchphrase: "It's Not That Simple!"**

CFT Theme #2: Consider context-dependency in conceptual meaning/understanding and knowledge application

- When trying to develop one's understanding of a particular concept, assembling such knowledge necessarily depends on **contextual dependency** (i.e., understanding of how that concept is shaped by and inextricably tied to the situation it is used in) Failure to do so leads to oversimplified sense of how such a concept might be applied elsewhere, and it is worth noting that this concern is particularly relevant for ill-structured concepts (i.e., where "essential" criteria cannot be found to apply that concept across all situations). Beyond that, it is important to understand that context matters not just in grasping the meaning of a concept, but also in deciding how that knowledge is applied and when considering "non-content" aspects of a situation (e.g., how a given context might shape one's motivation or *purpose/goal* when trying to learn something).
- **Example:** What does "corruption" look like in different contexts? In some situations, sharing information would indicate corruption (e.g., publicly sharing the home address and private information of a dissident), while *not* sharing information might indicate corruption in other situations (e.g., not reporting verbal harassment of an employee to HR).
- **Catchphrase: "It Depends!"**

CFT Theme #3: Strive for openness when understanding concepts, and flexibility when applying them

- You cannot always have a prepackaged prescription for how to think about and apply a concept, especially for situations without a single "right" answer. Thus, rather than merely memorizing and relying on a single "rigid" sense of knowing something, be open to **additional perspectives and points of view** that might help you understand familiar concepts in new and meaningful ways. In turn, rather than seeing a certain concept as only being able to be used in a particular way, it is important to appreciate the **limitless range of possibilities for how one can apply their knowledge** and to recognize how different situations might call for different uses of that knowledge.

- **Example:** When trying to apply good "time management" skills when completing different class assignments, different situations call for different actions. On the one hand, an overnight writing assignment (e.g., completing a page of math problems) might call for introspection in terms of understanding one's schedule and planning time to complete the work. However, for a multi-week group project, such introspection should be used to balance that awareness with consideration of the commitments of others involved.

- **Catchphrase: "Be Open in Understanding Concepts, and Be Flexible in Applying Them!"**

CFT Theme #4: Develop a mindset suited to manage ill-structuredness (e.g., irregularity, variability, unpredictability, novelty)

- Hoping for predictability in an ill-structured situation is not only unlikely to lead to success, but it runs counter to what ill-structured knowledge involves *in principle* – namely, that no criteria (or prepackaged plan of using that knowledge) will work for all situations that might be encountered. Thus, it is important to help develop a mindset that proactively plans and prepares for the emergence of situational factors that are **unpredictable, unique, and maybe never seen before**! This includes being prepared for the *uniqueness* of specific events/cases/situations, and for the different ways ideas/concepts might be used in different new events. Put another way, one needs to be prepared to use one's knowledge in the way that best fits the situation, rather than relying on a predetermined approach that (while simple) is less likely to be effective.

- **Example:** When going on an outdoor camping trip, it's often said that you should "be prepared". However, trying to "prepare" in the same way for all situations is inappropriate. For example, hiking in the frozen tundra will call for different precautions than rafting down freshwater rapids. Just as importantly, it is not possible to anticipate all the issues or possible problems that might arise in the wilderness. So developing a mindset of adaptively using one's knowledge for whatever arises is critical for survival.

- **Catchphrase: "Be Ready for the Unpredictable and New, the Non-Routine, the Unique!**

CFT Theme #5: Adaptive assemble knowledge in situations as they arise (rather than relying on "rigid" retrieval from memory)

- As alluded to before, when issues are complex and especially when there isn't a single "right" response, a predetermined plan for using one's knowledge is unlikely to lead to the best outcome. Thus, just as it is inappropriate to rely on a single "rigid" way of knowing something, don't lean on a single "rigid" sense of how to use what one knows across all situations. Rather, try to **adaptively assemble** knowledge from different experiences to meet the unique needs of whatever new situation you might encounter. And in turn, it is important to be ready to modify or shift how you apply that knowledge not only as the situation arises, but also on an ongoing basis *as the situation evolves*.

- **Example:** When trying to care for a loved one who is sick, the symptoms that they are suffering will play a big role in shaping how you tend to their needs (e.g., should we make a meal or would their stomach handle food poorly?). In turn, you cannot just rely on the same knowledge regardless of how the situation evolves. For example, if your loved one's condition worsens, you may need to be ready to plan their transportation to a medical facility, while also basing where you go on their specific medical needs.

- **Catchphrase: "What Does the Situation Call For?"**

CFT Theme #6: Pay attention to the individual case (event/situation/example) at hand

- Cases (i.e., events, situations or examples) in the world do not exist to just illustrate some single concept; and to assume so will lead to oversimplifying their complex nature, for each "case" is greater than (and has greater complexity than) the sum of its parts. Rather, it is important to make note of how concepts serve in navigating the **"rich" and multifaceted nature** of the specific real-world cases that they are being used for. Thus, regard "cases" as primary and be **attuned to differences between "cases".** In turn, avoid bias towards seeking similarity, and be prepared for concepts to illuminate "cases" in different ways even when they might otherwise be categorized similarly.
    - **Example:** When thinking about how to meaningfully teach history in a particular classroom setting, there are a variety of considerations (e.g., student demographics, age of students, classroom budget, educational standards that need to be followed statewide, class schedule/academic calendar, local community and its entrenched values) that need to be attended to when planning one's pedagogical approach. And the approach in that one "case" is likely quite different from what's needed in another "case".
    - **Catchphrase: <u>"Cases Come First!"</u>**

APPENDIX L: "CFT CATCHPHRASES" POWERPOINT SLIDE SHARED WITH MR. R

[Note: The only difference between the original version of this slide, as shared with Mr. R during PD2, and the one below is that this one includes two additional "catchphrases" not initially selected by the researchers before PD2: one that was conceived by the researchers in advance of PD3 ("Think Multiple Instead of Single!"), and one that was spontaneously added during PD6 in response to insights made by the collaborators ("Don't Think in Black and White!").]

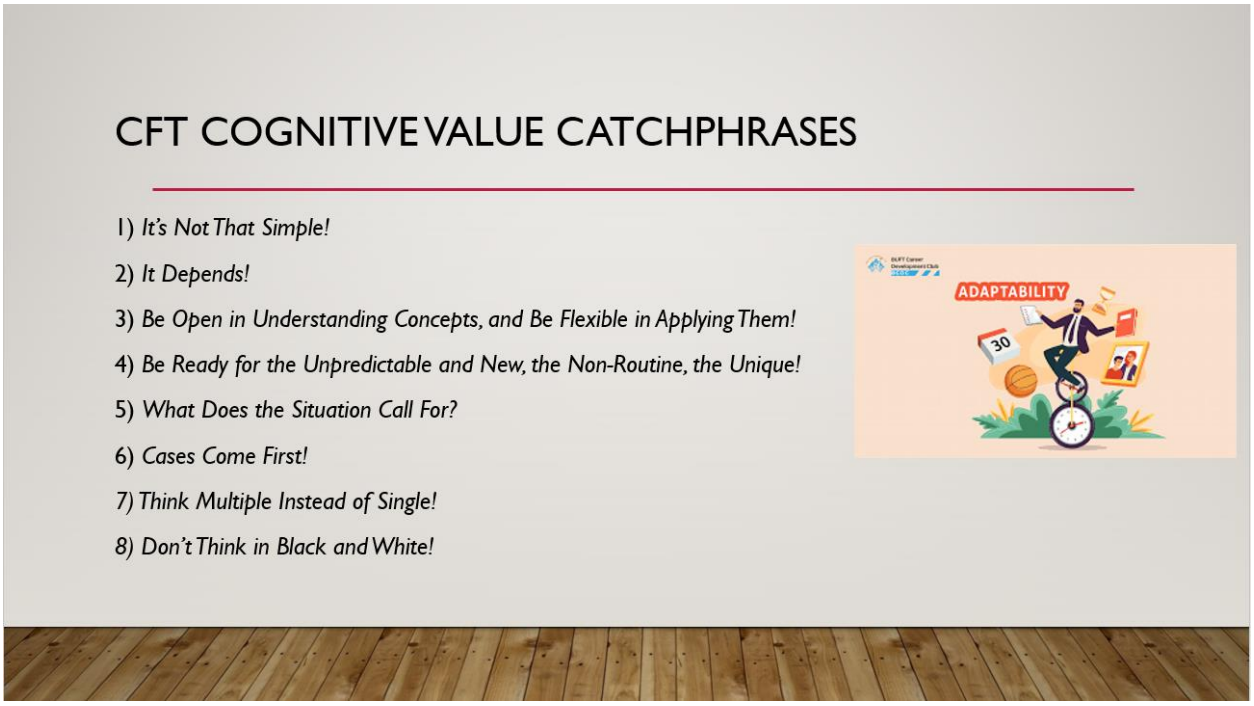

Figure 3. PowerPoint Slide with List of CFT "Catchphrases" Introduced to Mr. R (As Updated in PD6)

APPENDIX M: WEBSITE LAYOUT FOR DOCUMENT-BASED (DBQ) ASSIGNMENT

Building off the template for Mr. R's "Digital Document Based Question" assignment, this Google Sites-based task would have included the following website pages (as listed using a "Table of Contents"):

- A "Home" page aimed at explaining the overall purpose of the DBQ, while also identifying the criterion (or criteria) being met based on Michigan K-12 Social Studies Standards (https://www.michigan.gov/documents/mde/Final_Social_Studies_Standards_Document_655968_7.pdf) and the ill-structured question that would have been explored for the assignment.
- A "Background Essay" page that, if deemed suitable in consultation with Mr. R, would have provided an adequate amount of foundational knowledge for all students about the topic being explored, including relevant media if necessary (e.g., a YouTube video by The Economist).
- A "CFT/LICRA Tips" page, which would have listed key points for applying CFT/non-reductive thinking on the Web and using LICRA searches for online learning, with the goal of complementing and reinforcing key principles related of CFT/LICRA during the leaning activity.
- A series of multimedia "Documents" (anywhere from 10-30, laid out as "Document 1 (or A)", Document 2 (or B)", etc.) that, pending mutual agreement ahead of time by both the researchers and Mr. R himself, would seek to provide multiple credible perspectives on the ill-structured topic without overwhelming the students or risking their exposure to misinformation online.
- A "Sitemap" page to facilitate easy navigation of the different pages of the Digital DBQ website.

Alongside these site features, there would have also been a "Search this site" function offered on the upper righthand side of the page to help find relevant "Documents" provided on the site, in order to simulate the process of entering relevant search terms to identify meaningful sources when exploring ill-structured questions on the Web (i.e., in a manner aligned with conducting LICRA Web searches).

APPENDIX N: PLANNED INSTRUCTIONS FOR DOCUMENT-BASED (DBQ) ASSIGNMENT

[Note: While further revisions would potentially have been needed to make this DBQ assignment suitable for the purposes of a CFT study, the following was drafted as a tentative set of instructions to present to students in Mr. R's classroom setting (i.e., to list under the "Home" section). The topic used was South Sudan due to that being the topic covered in the example DBQ assignment shown to the PI by Mr. R.

The vast majority of this text was originally written by Mr. R himself for an actual assignment, although for full transparency, the website with said text that was previously shared with the PI and active in 2021 (https://sites.google.com/a/eastcobbmiddle.org/digital-dbq/home) has been taken down since then. However, certain text (e.g., the excerpt noted in italics) was added by the PI for research purposes.]

> Completing a Document Based Question assignment often entails examining historical documents from various time periods. Since the documents were most likely written at a time when today's technology was not available, they may seem stale and boring. Those documents can come alive through proper reading and analysis, but they are not very interactive unless some creative licensing is allowed. When examining an issue that is pre-Internet, primary and most secondary source documents will be from traditional reference material.
>
> However, with the emergence of the Web and our ever-changing world, the process of identifying meaningful "documents" today is noticeably different compared to the past. For example, amendments made to the Georgia Performance Standards for 7th-grade Social Studies in 2012 included the addition of the newly created South Sudan – which impacted not only geographical information, but also corresponding government documents and the way the country's history across time is understood. However, with that event being so recent, there are very few traditional reference materials on the topic that have been compiled at this point. Instead, there are plenty of Web 2.0 resources that have covered the conflict as the situation evolves; but for South Sudan and other topics (including reexamination of historical events further in the past), there is a need to navigate different sources of information effectively – especially when varying perspectives are presented about a given topic by different authors.
>
> With that in mind, as new histories are recorded in our digital age, what will be recognized as acceptable primary source documents in the future? As digital media becomes more important, what role will it play in shaping historical documents? As Web 2.0 becomes more interactive for users, is there a place for those interactive documents for historians?
>
> As aspiring historians, your task for this Digital DBQ assignment is to use this website (and the "Documents" that are listed in the "Table of Content") to learn more about the topic and answer the question below, in a manner that includes specific evidential support for any arguments you would make to defend your position on the issue. Be sure to take notes as you conduct your searches if that is useful when you share your findings later.
>
> To begin, please click on the "Background Essay" tab to get some background knowledge on the topic at hand. In addition, as you explore the site for this DBQ assignment, feel free to use the "Search this site" function at the top of the screen to try looking for terms you find relevant in the different "Documents" provided to you. *Finally, a "CFT/LICRA Tips" page has been provided for you to help you maintain cognitive flexibility and conduct meaningful LICRA searching in this space, so please refer to the tips on that page as needed throughout the assignment.*
>
> With that in mind, our current topic is the following:

SS7CG2 The student will explain the structures of the modern governments of Africa.

- (b) Explain how political, economic, and social conflicts resulted in the independence of South Sudan.

And here is the Interactive DBQ Question that you will explore:

- What are the main reasons for South Sudan's independence movement of 2011?

APPENDIX O: "CFT/LICRA TIPS" FOR DOCUMENT-BASED (DBQ) ASSIGNMENT

[Note: The following tips, which were originally written for participants recruited for a previous study (i.e., Clemente, 2018), would have been incorporated on the "CFT/LICRA Tips" page as a supplementary resource for Mr. R's students' DBQ assignment, with the goal of providing them "tips" for applying CFT/non-reductive thinking during navigation of the Web and using LICRA searches for online learning. The specific citation has been edited to properly align with how that article is cited in this manuscript.]

For this particular prompt, we want to encourage you to maintain a non-reductive worldview in line with what you've learned about Cognitive Flexibility Theory (CFT). For your assistance, here are a couple tips that can help you, as an online learning, complete this assignment in such a manner:

- First, when exploring complex history topics, ***try to be open to the multiple things that might have a meaningful influence on a particular situation***. For example, when thinking about the causes of World War I, it might be worth reflecting on not only the conflicts between political parties in power in different countries, but also how those countries/ economic issues might have played a role in escalating such conflicts.

- Second, history is an interconnected series of events full of countless people who often act in rapid and often unpredictable ways. So when considering the factors that might lead to a given outcome, ***think not only about how each factor played a role in shaping the outcome observed, but also about how those different factors might have influenced each other***. For instance, it is possible to not only think about causes of WWI that are political (e.g., Germany's siding with Austria-Hungary against Serbia) or economic (i.e., the impact of Britain's blockade on Germany's food supplies), but also how one impacted the other.

- Next, ***consider the validity of multiple perspectives when exploring complex topics***. History does not have a single "right" way of understanding it, and the way a person interprets historical events often depends on their background and values. For instance, growing up in a militaristic or pacifist society might shape who a given individual thinks might be more responsible for the start of WWI (out of all the actors who were involved).

- Finally, when reflecting on the interconnectedness of different ideas you have about a given topic, be sure to ***demonstrate logical progression in your thinking***, in terms of identifying clear and reasonable connections between your ideas. For instance, when thinking about Germany entering WWI (event X) and Britain entering WWI (event Y), did X cause Y, did Y cause X or did X and Y influence each other; and why? Thinking about this will help you better weigh the variety of factors that can simultaneously shape how history unfolds.

However, it is important to not only consider how you think about these complex topics, but also ***how you plan to use what you find on the Web (including search engines like Google and class-specific online learning environments like this website) to do so***. Reflecting on your Web-based behavior will help you more easily explore different ideas as they emerge, thereby deepening your understanding of not only U.S. History but also other ill-structured topics that you wish to explore and learn more about.

Therefore, for this particular prompt, we want to encourage you to explore the DBQ in a manner that involves learner-initiated, complex, reciprocally adaptive (LICRA) Web searching techniques (DeSchryver & Spiro, 2008). Each part of this concept warrants further clarification at this point:

- If your Web navigation is ***learner-initiated***, it means you are changing your search terms (i.e., in the "Search this site" box provided) to obtain desired search results, instead of solely relying on what is listed on the left-hand side or what is listed under a single "document".

- If your Web navigation is ***complex***, it means that you are not processing and evaluating information in a strictly linear way, but are instead open to exploring the DBQ "documents" in a variety of directions (e.g., sideways, backwards, viewing multiple "documents" at once).

- Finally, if your Web navigation is ***reciprocally adaptive***, then after the DBQ "responds" to your inquiry with results corresponding to what you requested, you are basing the next cycle of your searching (at least in part) on what the Web has revealed to you.

In order to follow these guidelines, keep the following things in mind (Note: This additional instruction builds off points highlighted related to LICRA Internet searches found at the following website: http://learntolicrasearch.weebly.com/traditional-vs-licra.html):

- ***Try to think about whichever perspective(s) you are interested in learning about and what steps might help you learn more about them*** (e.g., using multiple keyword phrases, looking for specific types of "documents"). Using specific search techniques can also help with this, such as using quotation marks for exact phrases (e.g., entering "Germany's role in WWI").

- ***Consider different types of content on each external link provided*** (e.g., images, video) and note where specific quotes and media come from. This offers insight into how content is developed, and which sources of information might help you learn more.

- Rather than (a) examining the "documents" (or search results) in the order they are listed or (b) going to a single website and following the links put there, ***be open to adjusting your goals during the task (e.g., by modifying your searches)***. By not passively accepting results that the Web produces in your initial search, this allows the Web to produce new content in response to any new searches you conduct – thereby fostering a dynamic collaboration between you and the Web that should continue throughout the task.

- Finally, ***when evaluating different perspectives on the Web, try to think about how they might relate to each other***. By doing so and (building off LICRA) being open to refining your search terms accordingly, deeper understanding of the topic can be ultimately attained.

APPENDIX P: WORDING OF QUESTION CATEGORIZATION FOR INTERVIEW PROTOCOL PLANNED FOR FUTURE EXPANSION OF STUDY FOR PUBLICATION PURPOSES

[Note: It is important to remember that while this wording was utilized for data analysis conducted in this study, further edits and modifications might occur to the interview protocol before its final presentation.]

⭐⭐⭐ - Essential for "Story" of Dissertation Study, Directly Tied to Answering [SQs] in Full

⭐⭐ - Valuable for Use as Supplementary Info for Answering [SQs] (or Questions Marked ⭐⭐⭐)

⭐ - Offers Meaningful Insights for Topic, But Can Be Skipped or Answered Via Email if Needed

- Important to Plan to Ask for Follow Up Information Surrounding Main Question

- Could Be Worth Asking to Flesh Out Response to Main Question *If* Not Already Addressed

- Has Potential Value for Narrative, But Can Be Skipped or Answered Via Email if Needed

APPENDIX Q: MR. R'S DOCUMENT WITH HIS TRANSLATION OF CFT "CATCHPHRASES"

[Note: For the purposes of transparency, all typos and formatting choices by Mr. R (e.g., font, color, bold/underlining) have been left intact, with the exception of font size and page breaks for readability.]

Not That Simple

[insert light bulb here]

The following are interpretations of CFT Cognitive Value Catch phrases that I use, have used or are nuanced interpretations of what I recollect having used.

It's not that simple.

- It's more convoluted than you would think
- What about other perspectives or concerns?
- Is there a different way of looking at this?
- Could we use a different lens to view this in another way?
- Could there be underlying motivations and if so, what might they be?
- Put yourself in that day and time. How are things the same? How are they different?

It depends.

- What are the different variables involved?
- How do different variables affect the outcome?
- What is the context?

Be open to understanding concepts, and be flexible in applying them.

- One size does <u>not</u> fit all.
- One explanation cannot be applied to all scenarios.
- Be open to change and how change occurs.
- There are multiple ways of coming to understand one thing – As many ways as there are people.

Be ready for the unpredictable and new, the non-routine, the unique.

- Let newness happen
- There in only one absolute when studying History – Things Change Over Time – My job, our job, be ready for change so that it may be recognized.
- Be ready for shifts in thinking
- What can be gained from thinking about things in a different way?

What does the situation call for?

- Based on what we know, based on what we have learned, what might happen here? What might you expect?
- What do you have to "know" in order to understand this?
- Can you know unrelated things about an object and still understand what a thing is or isn't?

- Not only, “what do we need to know” but “how” do we come to know it? [Could you explain the “Blues” to a deaf and blind person sufficiently that they could understand and appreciate the form? *I think so*.]

Cases come first.

- No what ifs!
- When looking at History we are in search of facts (in some cases artifacts). We don’t examine imaginary events, leave that to fiction.
- What happened?
- We do not engage in “whataboutism”.
- Real people, real events, real cases. Thinking originates with the cases

Think multiple instead if single.

- There is always more than one way, more than one answer (multiple-causality).
- There are always multiple perspectives- one only need to look to see!
- There are many ways of looking at event or object – There are many ways of understanding an event or thing.
- Everyone’s perspective is different. Everyone wears their own set of glasses in order to view the world. It takes multiple lenses to understand how things work.
- Understanding multiple viewpoints concerning an event is where the learning takes place.
- The world is magnificently complex and chaotic, there is no ‘one’ way to make sense out of it all.
- Making ‘order’ out of chaos is not the goal – only to understand that there are multiple ways of knowing, or coming to know a thing and that over time it all changes.

APPENDIX R: EXAMPLES OF DURING-TASK PROBING QUESTIONS ASKED DURING WEB-BASED LEARNING ACTIVITY INVOLVING LICRA BY CLEMENTE (2018)

- Why did you do what you just did? Can you tell me more about that? (i.e., asked in order to obtain the full thought processes of articulate individuals in the moment)
- What factors led you to go to this website? (i.e., can help identify subjects' motives)
- What sort of things are you looking for in these results/on this website? (i.e., to clarify how participant is sorting through high amounts of information at once)
- What thoughts are running through your mind at the moment? (i.e., if a subject has been noticeably quiet for an extended period)
- Do these findings remind you of anything? (i.e., possible ties to prior knowledge, including indicators of preexisting interest in the topic of WWI or other topics (e.g., WWII, warfare in general) that might influence their approach to exploring WWI)
- Did these findings impact you in any way? (i.e., aimed at addressing the possibility that as they dive more deeply into the topic, the findings that are most impactful to subjects will qualify as recent prior knowledge utilized later on in the task)
- What did you account for when making that decision? (i.e., if I am curious to get a sense of their cognition when responding to an uncertain or challenging situation)
- What factors are you taking into account right now? (i.e., in order to ascertain whether multiple perspectives are being considered when making a decision)
- Does anything stand out to you? (i.e., in order to understand what they notice on a given Web page, in a manner that avoids excessive interpretation by researcher)
  [Note: this bullet point was added after being useful in sessions with Subject 1.]

APPENDIX S: FINAL LAYOUT OF TOPICS TO BE USED FOR FUTURE INTERVIEW PROTOCOL

PROLOGUE: ENTERING COLLABORATION

- **TOPIC 1:** Initial mindsets entering collaboration (e.g., goals and expectations for different collaborators involved)

THEME 1: REFLECTIONS ON HOW TO TEACH HISTORY AS IT SHOULD BE TAUGHT (USING CFT "LENSES" AS SPRINGBOARD)

- **TOPIC 1:** Role of "connectedness" in teaching US History ("patriotism" vs. "protest", meaning of "conservative"; World Economic Forum)
- **TOPIC 2:** Helping students "look below the surface" (Harding/Trump; WWII/Afghanistan; "Hearts and Minds"/"Green Berets" for Vietnam)
- **TOPIC 3:** Managing higher cognitive load needed for learning with CFT mindset ("uphill climb" for Mr. R's current students; My Lai Massacre)
- **TOPIC 4:** Mr. R's process of learning/applying CFT "lenses" using catchphrases ("the case is the reference"; "concrete thinkers"; "novelty")
- **TOPIC 5:** Relationship b/w CFT "lenses" and Mr. R's understanding/practice of teaching (Mr. R's "translations"; "foot in same stream twice")

THEME 2: HOW HISTORY "SHOULD" BE TAUGHT VS. HOW HISTORY IS "TRADITIONALLY" TAUGHT IN SCHOOLS

- **TOPIC 1:** How the ways Mr. R is asked to teach US History are "contrary" to "how the world is" (Wittgenstein; "intermediate cases")
- **TOPIC 2:** Role of "conspiracy of convenience" in learning mindset being promoted to K-12 students (siloed nature of teacher casebooks)
- **TOPIC 3:** Potential pedagogical considerations for helping students change "the way they think" (e.g., to appreciate history's "messiness")
- **TOPIC 4:** Potential pedagogical considerations for helping students use the Web ("freedom" exercise; textbook as hypertext via "index")
- **TOPIC 5:** How to explore history's complexity or "messiness" in current "political climate" using CFT as a "cover" (Truman desegregation)

THEME 3: NAVIGATION OF U.S. HISTORY INSTRUCTION WITHIN "CONSTRAINTS" OF MR. R'S TEACHING "REALITY"

- **TOPIC 1:** "Constraints" of Mr. R's "reality" on his efforts to help students navigate "messy world" ("wedge points"; "jargon"; "museum")
- **TOPIC 2:** [Response #1 to Theme 3, Topic 1] Acknowledgment of Mr. R's pre-collaboration steps to add "little wrinkles of complexity" (Strategy #1: M-A-I-N; multiple causation of WWI)
- **TOPIC 3:** [Response #2 to Theme 3, Topic 1] Treating students as "completely new, novel and…complex", and how similar treatment of historical events could promote "little wrinkles of complexity" (Strategy #2: "kind of similar"; "Going Down the Road Feeling Bad")
- **TOPIC 4:** [Response #3 to Theme 3, Topic 1] Integration of Mr. R's "little wrinkles of complexity" (or CFT) within existing curriculum, particularly compared to what is presented in textbook (Strategy #3: "examples" for diff. perspectives; "12:00 High" vs. "Grave of the Fireflies")

- **TOPIC 5:** Current assessments' ability (or lack thereof) to foster appreciation of history's "mess" and/or complexity, particularly within Mr. R's current school setting (MEAP; Star Spangled Banner; Zen nature of "CFT novelty"; "conceptual blinders")
- **TOPIC 6:** Beginning reflections on which resources and logistics might potentially be needed for integrating "longitudinal" projects involving CFT/LICRA into Mr. R's existing classroom "reality" ("little incremental opening up"; "baby steps")

THEME 4: INTERACTION OF MR. R'S PEDAGOGY AND CFT "LENSES" WITHIN HIS CLASSROOM SETTING

- **TOPIC 1:** Impact of students' experiences on Mr. R's lesson planning ("not overwhelmingly a white majority"; "n-word" cafeteria incident)
- **TOPIC 2:** "Froggy" and less "student-like" nature of Mr. R's students currently ("better kids"; who might "really benefit from the feedback")
- **TOPIC 3:** Anecdotes about end-of-year activities involving "freedom", Part 1 ("Call to Freedom"; "big, huge scan"; "struggle" responses)
- **TOPIC 4:** Anecdotes about end-of-year activities involving "freedom", Part 2 (follow-up exercise "already wrapped up"; "Arab Spring")
- **TOPIC 5:** Anecdotes about end-of-year activities involving "freedom", Part 3 (the importance of accounting for perspectives shared by students, including those they might have "internalized" beforehand; "freedom to be who you are"; "liberal safety net")
- **TOPIC 6:** Anecdotes about end-of-year activities involving "freedom", Part 4 (potential use of "CFT-based, practical, in-the-classroom feedback" when offering students opportunities for better grades; "freedom from taxation"; Pledge of Allegiance)
- **TOPIC 7:** Perceived relevance of CFT "lenses" discussed for Mr. R's existing way of teaching (i.e., where they are complimentary or at odds)

EPILOGUE: LOOKING AHEAD TO FUTURE COLLABORATION

- **TOPIC 1:** Insights gained by Mr. R as a teacher related to future integration of CFT/LICRA (teaching mindset as "point of departure";"; "swill dairies")
- **TOPIC 2:** Insights gained by researchers from learning Mr. R's perspective and his "reality" ("inching towards embracing complexity"; Pinkerton)
- **TOPIC 3:** Advice from Mr. R for CFT/LICRA researchers in high school settings (i.e., with limitations and "cut off" nature of laboratory settings in mind)
- **TOPIC 4:** How the perspectives offered might be "interrelated to each other" (and need for "meta-analytic", "top-down" debriefing of collaboration)