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What Can Blue Do for You? LED Lighting with Longer Blue Wavelength Spectral Concentration Increases Student Reading Performance

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Abstract: *Classroom lighting, when set to high luminous (lx) and cooler correlated color temperature (CCT) conditions, can increase student focus, concentration, and oral reading fluency (Mott et al., 2012; 2014). However, when illuminance is too high and color temperature is too cool, irritating and adverse effects can occur such as visual fatigue and eyestrain (Noseda et al., 2010). We evaluated the effects of lighting enriched with blue to cyan spectral range, along with the normal industry recommended range of both CCT and lux, on reading performance. High school students were randomly assigned (within grade strata) to classrooms with LED lighting either within the normal range or blue-to-cyan wavelength. Two reading comprehension measures, an ACT practice test and an adapted assessment, were used. Students in the blue-to-cyan lighting rooms scored higher on the ACT Practice Test than did the control students. Implications for using optimal lighting conditions to enhance reading are discussed.*

Key Words: lighting, reading achievement, LED, wavelength, learning

Light plays a vital role in the way humans interact with their environment. Different forms of natural and indoor lighting are present in the daily lives of individuals and are critical to the cyclical rhythm of their functioning. Research has revealed that, in general, specific lighting specifications, as determined by correlated color temperature, CCT (warm white with more red component to cool white with more blue component), measured in degree Kelvin (K), and illuminance measured in lux (or lx), are responsible for a wide array of psychological and physiological effects, including visual performance (Chellappa et al., 2011), regulation of sleep (Van Maanen et al., 2016), alertness (Goven et al., 2011), cognition and mood (Goven et al., 2009), the production of melatonin and cortisol (Nowozin et al., 2017), and as being essential for a healthy rest-activity pattern (Alkozei et al., 2017).

These general effects of light on humans are well understood given the vast amount of research conducted since the industrial psychology "factory" studies where lighting was studied

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in work settings to measure worker productivity. These early studies were natural experiments where no randomization occurred. Moreover, the original research on lighting was conducted on behalf of the electric utility company and participants knew they were participating in a study comparing lighting conditions (Landy, 1997). Hawthorne effects plagued such early research efforts as participants' performance was affected by knowing that they were being observed (Gillespie, 1991). From the early 1900's to the present iteration of psychology-based, experimental studies, a wide array of methodologies has been utilized to examine all manner of indoor environments from surgery rooms to geriatric facility common spaces and schools (Landy, 1997).

PSYCHOLOGICAL EFFECTS OF LIGHT

Light is essential for normal human functioning and plays a key role in the sleep-wake cycle of life - one of the key aspects of overall well-being. Well-being includes cognitive processing (Boyce et al., 2003) and visual performance (Grangaard, 1995). Light regulates a large variety of bodily processes such as sleep and alertness (Dijk & Cajochen, 1997; Takasu et al., 2006; Viola et al., 2008; Wright et al., 2006), is a key component of cognition and mood (Taras et al., 2005; Veitch & McColl, 2001), enables production of important hormones such as melatonin and cortisol (Dijk & Cajochen, 1997; Leproult et al., 2001), and is essential for a healthy rest–activity pattern (Wurtman, 1975). Thus, lighting practically influences every dimension of human existence. Tanner (2008) reiterated, "Light is the most important environmental input, after food and water, in controlling bodily functions" (as cited in Wurtman, 1975, p. 467). Given these holistic benefits, several studies have examined lighting effects on learning.

LIGHT AND LEARNING

Recently, researchers have evaluated classroom lighting systems designed to positively affect learning. Such systems may play a crucial role in how students both acquire and retrieve information in the classroom. Specifically, blue wavelengths of light have been shown to enhance alertness and attentiveness, and leads to improved speed on reaction time tasks (Alkozei et al., 2017).

In educational research, light specifications have been evaluated under high illuminance and cool blue wavelength lighting (Govén et al., 2009; 2011). This setting enhances students' ability to concentrate as measured by the D2 Test of Concentration (Sleegers et al., 2013), especially if their biological clock is geared towards sleep during the first few hours due to going to bed late, which is common among adolescents. In addition to the development of students' cognitive and behavioral skills, lighting can support the development of visual skills by helping to improve visibility and supporting the ability to track material in books visually (Bringslimark et al., 2009; Earthman, 2004; Engelbrecht, 2003; Evans & Stecker, 2004; Higgins et al., 2005; Pawananon et al., 2009). Along with alertness and cognitive performance, visual task demand is also increased through the use of blue-enriched lighting. When optimal lighting is present in the classroom, it positively affects student achievement as well as their performance (Negiloni, 2019). Given the general cognitive benefits of focus, concentration, and mood revealed with blue wavelength components of lighting and high luminous conditions, researchers have studied content-area classroom learning under such lighting conditions.

THE ADVANTAGES OF BLUE-ENRICHED AND HIGH LUMINOUS LIGHTING

Mott et al. (2012) randomly assigned Grade 3 children to two differently lit classrooms. The classrooms were either provided with "focus" or "normal" light conditions. "Focus" lighting

consisted of high levels of illuminance (1000 lx) and blue wavelength-enriched cool white spectrum (5500 K), whereas normal lighting consisted of lower levels of illuminance (500 lx) and less blue wavelength (3500 K). Classroom teachers in both conditions taught the students oral reading fluency (ORF) (reading speed, accuracy, and expression) for 45 minutes. ORF was assessed at the beginning, middle and end of the school year. Although students in the enhanced blue wavelength and higher illuminance classrooms initially scored slightly lower than those in the control group before treatment began, by mid semester their ORF performance, a key component of reading comprehension, had increased at a greater rate compared with the control group.

To follow-up these positive results of blue-enriched and high-illuminance classroom lighting, Mott et al. (2014) conducted a similar study with the same lighting conditions, but with at-risk 3rd grade students from lower socioeconomic status as indicated by free and reduced lunch rate. Over the course of an academic year, students in blue-enriched, high-illuminance lighting classrooms increased their ORF scores at a greater rate than did students in traditional lighting classrooms.

THE DISADVANTAGES OF BLUE AND HIGH ILLUMINANCE LIGHTING

Although the previously mentioned studies on classroom lighting with blue enriched and high illuminance conditions revealed positive effects on student reading performance, there remains a problem with overly bright and cool lighting. That is, it is simply not visually appealing to learners. Moreover, Winterbottom & Wilkins (2009) suggested that certain features of lighting can even cause discomfort from overly high luminous conditions. The high illuminance in the Mott et al. (2012; 2014) studies was 5500 K and 1000 lx whereas in research using industry standard classroom lighting, the illuminance levels were in the range of 4100-5400 K and 300-500 lx (Safranek, 2020). Thus, the challenge is to find illuminance levels and wavelengths that maximize performance while minimizing discomfort. In the present study, we sought to identify blue-enhanced light specifications, given normal industry recommended luminosity levels for classroom lighting, that would improve student academic performance. Specifically, we tested increased blue-to-cyan wavelength lighting without overly high illuminance that suppresses the natural release of melatonin without it being too cool or bright.

LIGHT SPECTRAL ARRAY WITH BLUE-CYAN WAVELENGTH AND MELANOPIC SUPPRESSION

Previous research on classroom lighting has primarily consisted of evaluating student cognition, focus, concentration and learning in cool blue and high illuminance conditions (Alkozei, 2017). Blue light suppresses melatonin in humans which causes sleepiness (West et al., 1985). Blue enriched wavelength light exposure has been shown to enhance the conditions for learning primarily due to this melatonin suppression (i.e., it helps keep one awake and focused). Given the issues in the United States for high school students' lack of sleep and the negative educational consequences related to this lack of sleep affecting learning (American Medical Association, 2016), lighting that reduces melatonin secretion and raises energy levels should have beneficial effects (Choi & Suk, 2016). To avoid the issues of brightness and glare with high illuminance lighting, and the simple lack of visual appeal to students, the current study utilized LED lighting with a spectral array set to blue-cyan enriched while keeping illuminance levels in the normal range (500 lx).

RESEARCH QUESTION

Given prior research (Mott et. al, 2012; 2014), which revealed positive effects for blue and high illuminance light (5500 K and 1000 lx) on 3rd grade students' ORF scores, in the present study, we tested blue-to-cyan wavelength "Energy" light (include K 436 lux) versus "Normal" light more aligned with the industry standard for classrooms (4000-5400 K and 500 lx). Note that an important aspect rationalizing this study is that very cool, or blue, high illuminance conditions can be irritating and cause discomfort (Marek et. al, 2019). The Energy lighting contained a slightly lower illuminance level, to be more visually appealing, than the "Normal" lighting yet contained a higher spectral concentration of blue-to-cyan wavelength to allow for melatonin suppression. Additionally, differences between the Energy and Normal lighting utilized in this study were not discernable to the human eye.

The specific question of this study was: *Will students in classrooms with Energy LED lighting (4120 CCT and 436 lx) and a higher spectral concentration of blue-cyan wavelength score higher on a practice ACT reading test as compared with students in classrooms with Control LED lighting (3789 CCT and 486 lx) and a normal spectral blue wavelength?*

METHOD

PARTICIPANTS

Eighty-two high school students in a rural Mississippi high school consented to participate for course credit. On the day of the study, one student was absent. Another two students took the practice ACT but not the reading quiz. Thus, data from 79 students were included in the analyses. There were 22 seniors, 20 juniors, 18 sophomores, and 19 freshman.

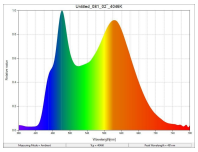
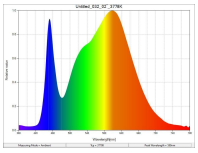
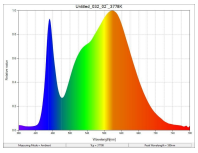
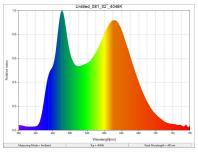
DESIGN AND SPECIFICATIONS FOR CLASSROOM LIGHTING

Four classrooms were designated to have either Energy or Control LED lighting installed. Classrooms were matched so that the two Control classrooms were on the same side of the building as the two Energy classrooms. All classrooms were measured for color temperature and illuminance (CCT and lx) in a 12-point equidistant grid at both the desk plane and 18" above the desk plane (student eye level) pre- and post-experiment utilizing a Konica Minolta Illuminance Meter model CL 70F. See Tables 1 and 2 for all light specifications. Each of the classroom lighting systems were switched out with LED luminaires made with a die-formed, 20-gauge, cold-rolled steel housing (Finelite Inc.). Three different LED setups were constructed as follows:

- Setup 1 Classroom 1: Energy, 4200 K, LM302N DAY, Samsung Electronics
- Setup 2 Classroom 4: Energy Tunable, 3000 K and 5000 K, LM302N DAY, Samsung Electronics
- Setup 3 Classrooms 2 and 3: Conventional, 4000 K, LM302Z+, Samsung Electronics

For both Energy and Normal classrooms, the light specifications were set and remained unchanged for the entirety of the experiment. Lighting controls were placed at ceiling height to avoid accidental dimmer adjustments by school personnel. Measurements were taken at the desk plane and 18" above the desk plane, both prior to the experiment and after the conclusion of data collection, to ensure fidelity and consistency of light specifications. The same 12-point grid protocol for measurement was utilized both times. For both the Energy and Normal light specifications, the illuminance levels were set to be equivalent although the Normal light

Table 1
Light specifications by classroom.

Groups	Avg. CCT	Avg. Lx	Spectral Array
Classroom 1 - "ENERGY" (n=22)	4177	540	 Blue-Cyan Wavelength
Classroom 2 - Control (n=17)	3833	537	 Normal
Classroom 3 - Control (n=20)	3615	521	 Normal
Classroom 4 - "ENERGY" (n=20)	4064	525	 Blue-Cyan Wavelength

classrooms were slightly more illuminance on average. The color temperature of the Energy classrooms was set at slightly higher CCT with increased blue-to-cyan wavelength (cyan wavelength range is 490-520 nm) (See Table 1). The difference between the Energy and Normal classroom lights were not perceptible to the human eye (Grant et al., 2021).

MATERIALS

Two reading comprehension measures were used: a norm referenced and validated

TABLE 2

GROUP COMPARISONS FOR "ENERGY" AND "NORMAL" CLASSROOM SPECIFICATIONS.

Groups	Avg. CCT	Avg. Lx
Energy n=42	4121	529
Control n=37	3724	532

national college entrance test, the ACT Practice Test, and an adapted reading comprehension assessment designed to measure high school students' reading comprehension. See sample items from both measures below:

ACT PRACTICE TEST READING SECTION (FROM CONRAD, 2007).

It can reasonably be inferred from the passage that the crew most likely did not play dominoes because:

A. they lacked the energy and desire.
B. they did not get along well enough to play a game together.
C. the Director would not have approved of the game.
D. the sea was too rough.

READING COMPREHENSION ASSESSMENT SAMPLE (FROM GARDINER, 2018).

Which of the following quotes best supports the central idea of the article?

A. Gen. John A. Logan, who headed the largest Union Veterans' fraternity at the time, the Grand Army of the Republic, is usually credited as being the originator of the holiday.
B. On May 9, 1866, the Cleveland Daily Leader lauded the Southern women during their first Memorial Day.
C. When Logan's order establishing Memorial Day was published in various newspapers in May 1868, Finch's poem was sometimes appended to the order.
D. Although not known by many today, the early evolution of the Memorial Day holiday was a manifestation of Lincoln's hope for reconciliation between North and South.

PROCEDURE

Students (n = 79) were randomly assigned by strata (grade level) to the four classrooms. All students entered their respective classrooms and sat at one of the desks. For the entirety of the experiment, all classroom blinds were kept fully closed to ensure equivalence of natural light. The teacher explained that they would be participating in a study about reading. Students were first administered a brief (20-minute) reading assessment at the beginning of class at 7:50AM - before the effects of lighting occurred (in particular, activation of pineal melatonin secretion from the energy lighting). After the 20-minute reading assessment, the ACT Practice Test (Reading Comprehension) was administered for 45 minutes. Student tests were collected after each administration and then students were dismissed.

RESULTS

The main question guiding this study asked, "will students in classrooms with Energy LED lighting (4120 CCT and 436 lx average) and a higher spectral concentration of blue-to-cyan wavelength (440-520 nanometer spectral range) score higher on a practice ACT reading test compared with students in classrooms with Control LED lighting (3789 CCT and 486 lx average) and a normal spectral blue wavelength?"

Although we were able to randomly assign students to classrooms by grade level strata, there remained the possibility that pre-existing differences remained due to the range of grade levels (four). To statistically control for such differences, a researcher-constructed measure of reading comprehension was used as a covariate. The reading test indeed correlated with the practice ACT score (r = 0.53). The results of an ANCOVA indicated that energy lighting students (n = 42, adjusted M = 53.15) scored higher on the practice ACT than the control lighting students (n = 37, adjusted M = 45.53), $F(1,76) = 4.15$, $MSE = 272.47$, $p < .05$, partial eta-squared = 0.052. Thus, the blue-to-cyan wavelength lighting positively affected student reading comprehension.

DISCUSSION

Given the issues relative to overly high illuminance and cool blue temperature lighting utilized in previous classroom lighting research (Mott et al., 2012; 2014), the current study sought to evaluate a similar lighting system with a spectral array enriched with cool blue-cyan wavelength yet containing a visually appealing lower CCT level (as measured in degrees of Kelvin) and an associated lower illuminance level (as measured in lx). In prior research, the CCT levels for the blue enriched lighting were measured at 6500 Kelvin. The high Kelvin levels can lead to up to a 5% higher illuminance output (Li et al., 2021). Although very cool blue CCT (6500 K) and high illuminance (1000 lx) lighting may have positive effects on learning, especially for sleep-restricted young adults (Grant et al., 2021), numerous studies have defined the cognitive benefits for these specifications (see the systematic and comprehensive review of lighting effects on cognition by Siraji et al., 2022). Despite these benefits, there are negative effects associated with very cool blue and high illuminance lighting. A main concern is that the associated flicker from blue CCT (6500 K and higher) and high illuminance (600-1000 lx) fluorescent lighting similar to that used in the Mott et al. studies has been found to be non-visually detected by the human retina. The negative effects from lighting with these specifications include sensory responses associated with visual fatigue, eyestrain and reduced visual performance especially over time (Grant et al.).

For the current study, it is important to reemphasize here: 1) the CCT for Intervention and Control classrooms was cool (5000 K) but given the blue-to-cyan wavelength (440-520 nm), there

were equivalent CCT levels between the intervention and control rooms. Additionally, the illuminance levels for control and intervention classrooms were both in the normal 500 lux range. Given the statistically significant results in the current study for student performance on the practice ACT and the control of extraneous variables, including learner differences, evidence for the intervention lighting impacting students' melatonin suppression and cognitive performance indicates that the blue-to-cyan wavelength lighting has similar effects to what has been shown with blue and high illuminance lighting. The benefit, and an important difference, is that the blue-to-cyan CCT lighting used in the present study does not contain negative non-visual effects cited above.

LIMITATIONS

As with any study, the results must be interpreted in light of their limitations. First, although students were randomly assigned to the classrooms based on the class content (math vs. literacy), the makeup of the two experimental groups still differed according to other uncontrollable factors such as student grade level. We used a covariate of basic reading comprehension to statistically control for pre-existing student differences in ability but groups may have still differed in other ways.

Second, we used high school students in our study, whereas previous studies used 3rd grade students (Mott et al., 2012; 2014). Whether the advantages we found would extend to other grade levels remains to be seen. Finally, our study involved only one experiment. At minimum this study should be replicated. However, considering our results are consistent with the previous results obtained by Mott and his colleagues, the evidence for lighting effects on learning is stronger.

FUTURE RESEARCH

Based on these limitations, future research, using a true experimental design to control for extraneous variables with randomization of participants, without restrictions necessitated by school scheduling, is necessary to confirm these findings. Such a design can be challenging in an authentic environment such as the one we used. But better designs, coupled with replications, are essential to confirm the advantages of certain lighting settings and to make recommendations for practice.

CONCLUSION

In conclusion, the current study sought to evaluate a similar lighting system with a spectral array with cool blue-cyan wavelength yet containing a visually appealing industry-recommended illuminance level. We found that students in the "Energy" (intervention) classrooms scored higher on a test of reading comprehension than did students in the "Normal" (control) classrooms. Thus, we have evidence for the blue-to-cyan, normal illuminance lighting condition positively affecting high school student performance absent the negative non-visual effects of blue (440-500 nm) and high illuminance lighting.

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Exploring the Phenomenon of Mismatch in University Program Choices and Admission: The Case of Public English-Speaking Universities in Cameroon

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Abstract: *In developing countries like Cameroon, students' participation in higher education can improve on the social, economic, and political status of the country. However, the mismatch between students' program choices and the preferences of the admission board may undermine this vision of national development. Surprisingly, even when students are admitted into mismatched programs, they accept and persist in the study of such programs. This study aimed to understand the mismatch phenomenon amongst university students using a phenomenological mixed method design. Data was collected from 34 final year students in the University of Buea and thematic analysis revealed the following three patterns of mismatch, including: first, students who never applied for their preferred programs of study; second, students who applied but were not admitted into any of their preferred programs; and third, students who were admitted to their least preferred programs of study from their ranked choices. These mismatches are mainly determined by prior subject choices in secondary and high school but students persist because other alternatives will result in time and money losses. However, while some students found congruence in their new programs, others indicated that their new programs still do not match their interests. Mismatches in program choices are detrimental to the quality of student participation. A multi-sectoral approach including efforts from basic, secondary, and higher education can limit the effects.*

Key Words: mismatch, program choices, admission, persistence, phenomenology

Participation in higher education is central to enabling social, economic, and political development both at individual and societal levels, particularly essential for developing countries such as Cameroon. Nevertheless, the gateway to the benefits of higher education is hinged on admission into a higher education institution such as the university. The admission process is a two-way process where the autonomy of both the applicant and the admission board regarding program choices may either align or mismatch. Therefore, the admission process is crucial, but central to that process is the selection of programs of study, which can influence the overall learning experience of an individual. Research on higher education choices indicates that program choices have significant effects on key university processes such as enrollment (Soppe et al., 2023); persistence (Muskens et al., 2019), and graduate outcomes (Bo et al., 2019; Campbell et

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al., 2021; Ntemngweh, 2016). In developing countries such as Cameroon (unlike developed countries such as the US, Chile, UK, etc.), the program choice made by the applicant is central to admission decisions. The admission board studies files of applicants based on the programs of study that they have indicated. College or institutional choices are relative to the individual and the institution is unaware of possible alternative institutions that the applicant may be considering. While errors in choosing a program of study may result in complete rejection in most universities around the world, in Cameroon, errors in choosing a program of study may rather result in admission into a completely different program of study, sometimes resulting in a program mismatch.

Previous research has primarily examined the phenomenon of mismatch in contexts where university admissions involve selecting from a range of institutions, rather than programs of study. In this context, mismatch is viewed in relation to the students' ability and choice of institution and has been defined as a phenomenon, where low ability students sort into too challenging or highly selective or high-quality institutions while high ability students select less challenging or less selective or low-quality institutions (Belasco & Trivette, 2015; Dillon & Smith 2017; Hoxby & Avery, 2013; Prakhov & Sergienko, 2020). This view has undoubtedly limited the understanding of mismatch in a context like Cameroon where programs of study shape admission decision instead of institutional (or college) choices. Generally, mismatch can be viewed as a phenomenon where a fit is not found and, in this study, mismatch was conceptualized as a phenomenon where students do not experience a program fit based on their program preferences. Including students' perspective in defining mismatch is critical in developing solutions that are central to the students' needs. When students apply to study at universities in Cameroon, particularly public and English-speaking universities, which are the most highly solicited because of the low cost and the Anglo-Saxon culture respectively, they can choose up to three programs of interest ranked in order of preferences. When students do not get selected for admission into any of these programs, they can re-apply with new choices. In most cases, at the second round of application, students rather gain admission into programs that they never selected but are considered by the university admission board as a good fit based on their high school as well as secondary school performances. Nevertheless, most of these students experiencing this kind of mismatch, enroll and persist with these mismatched programs until graduation. This phenomenon presents a kind of program mismatch stemming from a misfit between students' preferred programs and the programs offered for admission by the university admission board. This kind of mismatch has been understudied in the college mismatch literature.

The paper therefore provides empirical evidence from 34 final year undergraduate students who were admitted only in the second round of application (it is worth noting that all second-round applications are not due to a mismatch) and who indicated a mismatch between their preferred program and the current program of study at the University of Buea. In so doing, the paper explores three patterns of mismatch that are not common in the literature while analyzing the determinants of mismatch and the rational for persistence with mismatched programs to provoke policies that can improve on students' choices and the admission process. Consequently, the current paper contributes to the existing literature by providing new patterns of mismatch from the perspective of the student - a view that Campbell et al. (2021) have previously noted, was missing in the understanding of educational mismatch. This paper examines the choices of the students in the framework of the Self-Determination Theory (SDT), which posits that autonomy in choice making fosters intrinsic motivation relevant for students' success (Ryan & Deci, 2008). The paper also studies a cohort of students in the context of Cameroon, a developing country where studies of this

nature are significantly missing. In addition, the paper looks at persistence in relation to mismatches while providing evidence for further research into the causal relationships of program mismatch and student drop-out, poor performance, unemployment, and so on. Summarily, the paper seeks to achieve the following;

1. To describe the patterns of mismatch in university admission among final year students
2. To identify the determinants of mismatch amongst final year students
3. To analyze the rationales for persistence in mismatched programs

The rest of the paper structure provides a literature review including a briefing of the program mismatch literature, a theoretical framework as well as the admission procedures in Cameroon - case of the University of Buea. The literature review section is followed by the methods section, findings, discussions, conclusions, and a way forward.

LITERATURE REVIEW

PROGRAM MISMATCH IN UNIVERSITIES

While mismatches are primarily associated with institutional choices, the selection of programs is also crucial for participation in higher education. Program mismatch has been described here as a phenomenon where students' preferred programs do not match the programs to which they were admitted, yet, these students accept the offer, enroll, and persist in such programs. Campbell et al. (2021) opined that mismatch breathes inefficiencies. In their study, they found that subject preferences were a large determinant of mismatch in earnings. However, they noted that a key limitation of their study was students' perspective in defining mismatch. An individual's perspective of their lived experiences reveals several nuances that cannot be understood in the abstraction of the experiencer. Similarly, Soppe et al. (2023) analyzed 20,104 academic records from 13 programs in Dutch universities and found that program misfit affected students' enrollment behavior. Enrollment rates were lower in programs with more intensive matching, indicating the need for students to check a program fit before application. Therefore, mismatch has dire consequences at all phases (admission, persistence, retention, and graduation) of higher education participation. Holmegaard et al. (2016) indicated that when students' expectations are not met, they struggle to learn and make compromises to bridge the gap that sometimes remains counterproductive.

While most of the studies on higher education have viewed choices from an economic perspective (Vulperhorst et al., 2020), Holmegaard et al. (2015) found that choice making is a personalized process where students feel encouraged to identify their interest, informed and validated within their social networks. Sometimes, students' choices are wrong and disregarding these choices uncarefully can further exacerbate the negative emotions associated with wrong choice making. This is why Bergerson (2009) stressed that understanding the decision-making process from an individual perspective can be more supportive of students' choices. In line with a more personal perspective, Vulperhorst et al. (2020) employed a student interest perspective to study the dynamics of program choices using semi-structured interviews with 20 Dutch high school seniors. In the study, they found that students' programs of interest are dependent on a back-and-forth dynamic process between program and interest, and vice versa. Similarly, Holmegaard et al. (2014) in a longitudinal qualitative study of the higher education choices of 38 Danish students indicated that the choice process is a complex ongoing process made by an individual in consideration of social interactions. Regardless of this, some authors have argued that mismatch usually occurs in the application process rather than at the admission process. For

instance, Dillon and Smith (2013) studied 2,125 participants from the1997 National Longitudinal Survey of the Youth cohort in the U.S and found that application and enrollment decisions mostly drive mismatch. Hoxby and Avery (2012) have also found that high achieving students from low-income backgrounds do not apply to selective universities in contrast to high achieving students from high-income backgrounds. It is consistent in the literature that students internalize the realities of their context when making choices. However, students also have the responsibility of accepting the consequences of going along with one choice or the other as posited by the Self-Determination Theory.

THEORETICAL FRAMEWORK: SELF-DETERMINATION THEORY

Students' definition of mismatch reveals the autonomy and volition employed in the choice-making process. The Self-Determination Theory (SDT) developed by Ryan and Deci in 1985 addresses autonomy and volition in choice-making. The theory stresses individual volition in the choice process and argues that when individuals make choices out of their own autonomy and willingness, they feel intrinsically motivated to act. Students' choices when made through an autonomous decision are accompanied by the experience of endorsement and willingness (Moller et al., 2006). In cases of autonomous decision making, the quality of one's experience and performance is higher than when the decision is controlled (Deci & Ryan, 2000), as cited in Moller et al. (2006). The practice of allowing students to select their programs of interest endorses their volition as actors in the decision-making process. However, when these choices are not achieved, they are likely to lose autonomy over their learning experiences. SDT also acknowledges that autonomy is hinged on a personal understanding of the rationale of a choice, allowing others to provide these rationales in an unpressured way. On the one hand, students want to enter the university and study in certain programs of interest while on the other hand, universities want to fill up their seats and increase enrollment in new programs. The interest of these groups – the applicant and the admission board - are sometimes conflicting. Following the tenets of SDT, when students are provided with an understanding of the meaningful rationale (Moller et al., 2006) of the importance of a program that was previously not selected by the applicant, their autonomy in choice and decision making will increase. This becomes a necessary pre-condition for driving actions toward success

Students must internalize the change process and while some others may accept this change, it may be difficult for some others to accept, creating internal conflict and frustration. The process of internalizing changes in a choice-making process requires support, and this is what the authors of SDT (Ryan, 1995; Ryan & Deci, 2008) refer to as autonomy support, a process where attitudes and practices of a personal or a broader social context can facilitate the organization and regulation of an individual's actions and experiences. Competence is necessary to achieve any type of motivation. However, Deci and Ryan (2000) argued that perceived autonomy is required to make the motivation intrinsic. Soppe et al. (2023) also argued that the need to feel a sense of belonging and stay motivated limits dropout and improves student engagement.

ADMISSION PROCEDURE IN PUBLIC ENGLISH-SPEAKING UNIVERSITIES IN CAMEROON

In August every year, successful students in the Advanced Level General Certificate of Education (G.C.E A/L) apply to one university of interest or the other in Cameroon. The General Certificate of Education is a national examination written after five years of secondary education to obtain an Ordinary Level Certificate (G.C.E O/L) and after two years of high school to obtain a G.C.E A/L. These certificates certify students for completing secondary education in Cameroon.

Cameroon is a developing country in sub-Saharan Africa that relies on the educational sector partly for social, economic, and political development. The G.C.E A/L is used as the entry requirement into higher educational institutions in Cameroon (in addition to an entrance examination for some highly specialized programs). The University of Buea is one of the two cherished public English-speaking universities in the country and it serves more than 40,000 students who have received secondary education dominantly in English schools. Public universities in Cameroon are more affordable than private universities as they operate on an almost cost-free tuition policy. In all public universities in Cameroon, students pay an annual tuition fee of 50,000frs CFA (approximately 83 USD when 1 CFA = 0.0016 USD) compared to the annual tuition fee in private universities amounting to at least 500,000 CFA (approximately 825 USD when 1 CFA = 0.0016 USD).

For admission into undergraduate programs at the University of Buea, every applicant selects three programs of study (majors) indicated in a ranked order of preference. In this way, students have the autonomy to choose whatever programs of interest that they desire. However, students' choices are of course self-regulated by the admission requirements for each faculty indicated in the online admission portal. When applications are received, an algorithm match is performed to sort the students following their ranked order of preference. For instance, if a student selected Educational Psychology as his/her first choice, Animal Psychology as his/her second choice and Zoology as the third choice, he/she will automatically be selected into the first choice (Educational Psychology) if qualified following the set criteria for admission to the program. However, if he/she does not get admission into the first choice, he/she will be selected for the second or third choice accordingly. Still, if students do not gain admission into any of these three dchoices, they are given an opportunity to re-apply. If they do not get selected into any of the self-selected programs in the second round of application, they would be admitted into a program that was not on their ranked list but the admissions board considered it a good fit for match. It is in this context of re-application and match with programs that were not self-selected that this study was designed to explore the phenomenon of mismatch.

METHODS

The study employed a phenomenological mixed method research approach with a two-phase sequential data collection approach. The phenomenological mixed method approach also referred to as mixed methods phenomenological approach (Mayoh & Onwuegbuzie, 2015) can simply be described as the use of quantitative and qualitative methods to study the lived experiences of individuals from their own perspective (Martiny et al., 2021). The study adopted the Quan-Phen design which involve two sequential phases from a quantitative phase to a qualitative phase (Mayoh & Onwuegbuzie, 2015). The motivation for using the Quan-Phen design was to identify participants experiencing mismatches construed as a phenomenon where students do not get selected into their preferred programs of study. However, the quantitative phase aimed to identify participants and themes of discussion for the qualitative phase. The second and qualitative phase constituted six Focused Group Discussions (FDGs).

PARTICIPANTS

The sample of the study was made up of 34 final year undergraduate students at the University of Buea who were only admitted at the second round of application and indicated a program mismatch. These students had already spent about two and a half years in the current

mismatched program of study out of the expected three years of study. Students ages ranged between 18 and 44, with majority, 28 (82%) of the students between ages 18 and 24, followed by 05 (15%) of the students aged between 25 and 34 and 01 (3%) between 35 and 44 years. The sample included 15 males and 19 females from across 11 establishments (including faculties, schools and colleges) within the University of Buea. Each student selected a pseudonym, used throughout the study. Informed consent was obtained from all individual students who participated in the study. Written consent to participate was collected through a semi-structured questionnaire used to select participating students and reinforced through verbal consent during the FDGs.

INSTRUMENTS

The study set out to explore the phenomenon of mismatch in university admission referred to here as one where students were not admitted into their preferred programs. To evaluate this phenomenon, a semi-structured questionnaire was administered to university students to identify those experiencing mismatch. The semi-structured questionnaire collected data on students' current program of study, programs applied for, reasons for mismatch, feelings toward program as well as gender, age, and other demographic data. The survey identified 34 students who reported experiencing a program mismatch. These students participated in six FGDs consisting of six students each of exception to the last group that included four students. The FGD provided in-depth discussions on why students persisted in mismatched programs and the challenges they faced.

DATA ANALYSIS

Findings from the quantitative data were analyzed descriptively; however, open-ended responses were analyzed thematically like the findings from the FGDs. Descriptive analysis included frequency counts, percentages, means and standard deviations. Thematic analysis of the questionnaire responses was read over and over to identify keywords that described the students perspective of mismatch. After this, these keywords were merged to develop codes while taking into consideration the frequency of the codes indicated here as grounding. After coding, sub-categories were identified and sometimes merged to develop themes in cases where similar sub-categories were identified. In the FGD, after familiarization of the recorded discussion, the data were transcribed and in addition to the notes taken during the discussions, the analysis proceeded in the same order as the thematic analysis of open-ended responses previously described.

RESULTS

Findings are presented in three sections, including patterns of mismatch, determinants of mismatch and rationale for persistence, as seen in the following sections:

1. PATTERNS OF MISMATCH

Analysis of the data revealed three patterns of mismatch amongst students who did not get admitted into their preferred programs of study including; those who had never applied for their preferred programs (pattern 1); those who had applied for their preferred programs and were not admitted to any program chosen (pattern 2) as well as those who were only admitted to their second or third choice based on their ranking (pattern 3) as presented in Figure 1.

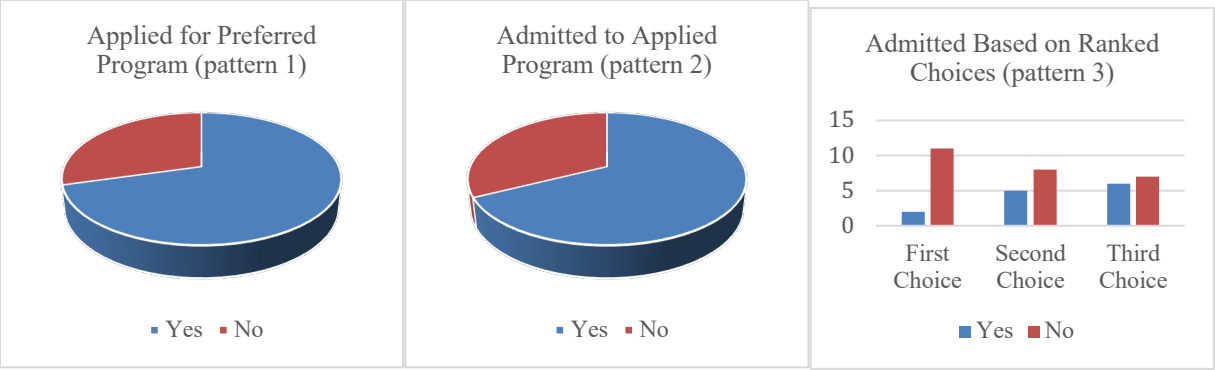

Figure 1. *Patterns of Program Choice Mismatch*

Figure 1, indicates that students experience program mismatch based on different patterns. Among the 34 students who reported experiencing mismatch, 10 (29%) never even applied for their preferred programs, 13 (54%) did not get admitted into any of their preferred programs, while the majority of those who applied and were admitted, 11 (46%) did not get admitted into their first choice (which represented their preferred programs). A computation of standard deviation indicated a score of 1.25 with a mean of 11.33. This suggests a moderate variability in student mismatch patterns. No pattern dominated the phenomenon as the frequencies in each pattern are very close to the mean.

The mismatch created negative emotions for students as they reported feelings of frustration or disappointment. In expression of frustration, one of the students indicated "I felt totally unqualified not to have been taken for at least one of these programs, it was frustrating – Brave (male)". Another expressed that "it was quite frustrating – Cari (female)". According to these students, not being accepted for any of their selected programs left them feeling 'unqualified' evoking a feeling of frustration. Similarly, another student indicated that they felt disappointed but could not lose the year of study as she expressed "I was disappointed but I could not wait for the second year so I just decided and accepted the program – Abra (female)".

2. Determinants of Mismatch

When students' reasons for not being accepted into their preferred programs were analyzed, the findings revealed four broad themes viewed as causes of program mismatch, as presented in Table 1.

Table 1. *Determinants of Program Mismatch*

Theme	Sub-category	Grounding	Quotation
Inadequate academic pre-requisites	Missed a key required subject	12	*"Because I never had ordinary level mathematics"* *"I did not have what it takes that is requirements like O level math was absent"* *"I did not have maths"* *"Because lack of O Level Maths"* *"Failed probatoire maths"*

Theme	Sub-category	Grounding	Quotation
			"Because I failed advanced level literature in English"
	Did not have the required points	5	*"Maybe I didn't have the required points for the program"* *"My points were not sufficient"* *"Because I didn't have the required point for the program"* *"Due to my A/L grades"*
	Failed the pre-requisite exam	4	*"Failed concur"* *"I failed the concur"*
Information deficits	Unaware of the availability of the program	4	*"Wasn't aware it existed, so didn't fill it in my application"* *"Program was unavailable"*
	Poor orientation	3	*"I was misled, I had good points to pursue any course I wanted"* *"I made a mistake in choosing the program choices"*
	Unaware of the admission criteria	2	*"I have no idea what the university does or select as criteria to admit someone in a department"*
	Unsure	3	*"I don't know"* *"Maybe I didn't meet the necessary requirements"* *"I have no idea"*
Admission flaws	Used me to boost new programs	1	*"Animal Psychology was a new program and they just gave me"*
Cost of the program	Cost of the program	1	*"I did not bother applying because when we made inquiries, it turned to be expensive"*

Table 1 indicates that students were not predominantly selected for their preferred programs because they did not meet the academic prerequisites 20 (57%) of the university program. Students did not meet the academic prerequisites either because they missed a required subject, they did not have adequate points for entry into the preferred program or they failed the pre-requisite exam. Information deficits 10 (29%) equally accounted for the reasons why students were not admitted into their preferred programs of study. Students with information deficits reported that they were unaware of the availability of the program; had poor orientation; did not know the admission criteria, and some were unsure about why they were not admitted into their preferred programs. Fewer students associated a mismatch to admission flaws 3 (9%) where students indicated that the admission board intentionally did not admit them in their preferred programs but rather in another program so they could boost enrollments in those programs. Students also indicated that their program of interest was unavailable. High cost of program 1 (3%) was the least indicated reason for program admission mismatch.

3. PERSISTENCE IN MISMATCHED PROGRAMS

In the case of mismatch in program admission, students were only given admission offers. This means that they could decide to turn down the offers; however, turning them down was not as simple as perceived by the students. When students' reasons for persisting in the programs were analyzed, the cost of the program; encouragement from 'significant others' and stringent procedures associated with program transfer were the initial reasons for persistence, as described in the following sub-sections.

COST ASSOCIATED WITH PREFERRED PROGRAMS

Many of the students who experienced program mismatches considered other options such as a change of institution. However, they could not afford the cost of leaving their home town to study in other locations as expressed by one of the students "My father never wanted me to go out of Buea plus that will be too much expenses – Mira (female)" and another indicated "It would have been expensive to go and study in another place outside Buea – Stella (female)". These students raise the issue of location, associated with the cost of studying out of their hometown as significant reasons why they did not consider other options.

However, for some other students, the cost of the program was associated with high fees charged with the option of studying in private institutions as expressed by one of the students "Private universities admit without mathematics but financial issues so I could not go in - James (Male)". According to this student, missing a key admission requirement would not have been a problem if he had considered studying at a private university. However, the high tuition fees of private universities prevented him from considering this option. Similarly, another student indicated "I did not have Math ordinary level and they took me into plant science but I never wanted to do it so I considered going to a private institution that's Fomic Polytechnic Buea for computer engineering but it was too expensive for my parents – Abra (female)". In a slightly different pattern, another student indicated that a change of program would have meant paying tuition fee a second time and she could not afford these expenses as she expressed "I could not afford paying fees again – Mary (female)"

ENCOURAGEMENT FROM 'SIGNIFICANT OTHERS'

Regardless of the cost of the programs, some students who considered an alternative solution persisted because of the encouragement received from significant others such as friends and family. For instance, one of the students expressed that "I told my mum that I will not go to school anymore and she advised that no knowledge is useless – Brave (male)". According to this student, his mother encouraged him to pursue the unchosen program, which might eventually amount to something useful. Similarly, another student indicated that, "My friend told me that I could just accept the major then minor in my desired program - Maon (male)". According to this student, his friend encouraged him to continue pursuing the undesirable program and consider taking a minor in his area of interest. Similarly, considering encouragement from friends, another indicated that, "a masters' student, my friend advised me that educational leadership is close to management so I took it - Mary (female)". According to this student, it was a senior student with prior experience of the university system who advised her to continue.

STRINGENT PROCEDURES ASSOCIATED WITH PROGRAM TRANSFER

Students always have the option of changing their programs of study at the onset of admission. To change to a new program, students must satisfy all the entry requirements of the

new program. While this was not possible for most of the students because they were not admitted in the first place since they did not meet certain academic pre-requites, others tried to and discovered that the process was stringent as expressed by one of the students *"initially I thought minoring in accounting will help me switch but I discovered that my degree program did not even allow me to take a minor – Brave (male)".* According to this student, his initial boost for accepting a program that he did not prefer was the hope that he could take some courses in his area of interest, but this was impossible since the degree program standardly did not accept students to take courses out of the program.

Similarly, another student indicated that *"applying for change of program is so complicated, I tried and waited for weeks then I just decided to continue in the Educational Psychology – Cari (female)".* According to this student, the lengthy process of the program transfer made her persist in the new program of study. Frank also agreed that the waiting time was too long as he expressed *"...that, I have to wait till the next academic year to change so I just decided to continue – Frank (male)"*.

When students were asked if they would continue with the same program (mismatched programs) at the postgraduate level, the findings indicated that some students, 19 (56%) found congruence with their mismatched programs and were ready to continue with the same programs at the postgraduate level. The dominant reason for this view was because these students felt that continuing with these programs would ease admission access at the postgraduate level. Similarly, others had recorded high academic performances in these programs and now considered the programs suitable. However, 15 (44%) indicated that they would not continue with the same programs, if they had to undertake postgraduate studies because of incompatibility between their interest and that of the program. Some felt overqualified and viewed their current programs (mismatched programs) as less prestigious.

DISCUSSION

Program mismatch can deter students' success; however, it is an understanding of students' own definition of mismatch borne by their experience that can provide guidance to solving the problems of program mismatch and improve students' learning experiences in Cameroon. This is particularly important in public English-speaking universities that predominantly host English-speaking students. Students experience three patterns of mismatch dominantly emanating from the application process and enrollment decisions, similar to the findings of Dillon and Smith (2013) in the U.S. However, institutional support can help to limit program mismatch as well as the negative effects associated with it. All patterns of mismatch indicated the absence of a balance between students' preferences and competencies. As posited by the Self-Determination Theory, such an imbalance will hinder endorsement and willingness. When students do not endorse or willingly accept their programs of study, learning can become less meaningful. The findings showed that accepting this new state was a struggle, an easy one for some students but a very difficult one for others. This finding supports that of Holmegaard et al. (2016) which indicated that as students make compromises to meet unmet expectations, their actions may sometimes remain counterproductive. This also alludes to the role of individual differences in dealing with difficult situations. Therefore, it is important to increase institutional support and narrow the gap between program preferences and individual competencies.

In the first pattern of mismatch, students do not even apply for their preferred programs. This indicates that students face barriers to their autonomy prior to the university application process. In the second instance, students applied but did not get accepted into any of their preferred

programs of study. This mismatch is completely different from the previous one in the sense that, students expressed their programs of interest by indicating them on their application form yet they were not accepted for any of the selected programs. No doubt, every admission is based on set criteria and when students do not meet these application requirements, they cannot be offered admission. However, several factors account for students' abilities and competencies, which culminate in different types of performances. These differences should also be considered in the admission process by creating multiple pathways for entry and considering several competencies in admission such as extracurricular activities, community service, etc. Finally, in terms of patterns, a third group of students considered a program mismatch in cases where they were not accepted to their preferred programs ranked as first choice in their application forms. This is linked to the absence of an understanding of program entry requirements. Students are unaware prior to the application process that every university program specifies certain high school and secondary school subjects with relevant points. In the absence of these, students will not be admitted into their preferred programs.

The need to use an intersectoral effort from basic to tertiary education is crucial. Interestingly, the determinants of program mismatch are similar across the different patterns of mismatch and are principally provoked by experiences before the admission phase. For instance, not meeting the academic pre-requisites of certain programs results in program mismatch. However, certain academic pre-requisites such as mathematics at the G.C.E O/L are missed two years prior to high school, but it is only at the university application phase that students discover that these pre-requisites will hinder them from successfully gaining admissions into their preferred programs. Therefore, there is a need for systemic action across all levels (basic, secondary, and higher) of education that support students' choices. Secondary schools should adequately prepare their students in terms of the combination of subjects and academic routes. On the part of the university, the online application interface can be improved with a focus of turning it into a mini-guide containing a briefing of the program content such as requirements, courses, learning experiences, career opportunities and so on. This online application interface can also allow students to indicate their subjects and number of points earned as well as their preferred program to test for a program fit before application. Soppe et al. (2023) provided evidence that a prior program fit test can improve enrollment behavior. This can serve to limit the problems of mismatch that results from information deficits. Similarly, guidance and counselling services can develop strategies for students to voice their perceptions of programs. This will allow the university community to identify and provide support to students who are struggling with adjusting to mismatch programs.

Public universities are low paying and can equally increase access to low-income students by diversifying the admission criteria. For as long as possible, the University of Buea has focused only on academic pre-requisites for selection, but other competencies and skills have become relevant for enabling diversity. In this way, the university can consider diverse competencies such as adaptability, resilience, motivation, and interest that are necessary to transform underperformed students into high achievers. In addition, the university can create separate admission routes like allowing underperforming students to take pre-requisite courses that will enhance their performances since there is no evidence that underperforming students cannot catch up with the others. There is also a need to develop policies and promote practices that do not stiffen the process of program transfer in cases where students struggle to find a program fit.

CONCLUSION

This paper presents quantitative and qualitative evidence from a phenomenological mixed method study of program mismatch defined from the students' perspectives considering the patterns of mismatch, determinants, and rationales for persistence. Data collected from 34 students revealed three patterns of program mismatch fueled by inadequate academic pre-requisites, information deficits, high tuition cost and university admission flaws. However, although some students persist due to encouragement from significant others such as parents and peers, others feel bounded by the barriers of unaffordable high tuition fees charged by alternative universities as well as stringent program transfer procedures. Again, some students found congruence and will want to persist in such programs but for others, it remains a frustrating struggle. Institutional support through intersectoral policies and practices can narrow the gap between students' preferred programs of study and admission offers.

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The Influence of COVID-19 On Special Education Due Process Hearings Involving Pennsylvania City Local Education Agencies

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Abstract: *Due to the recent nature of the COVID-19 Pandemic there has been limited study of its influence on special education due process hearings. To explore this phenomenon, the present study compares hearing officer decisions involving Pennsylvania city Local Education Agencies (LEAs) for the two years before and after the global health crisis. Frequency of appearance, hearing officer ruling outcomes, and remedies owed by LEAs, are explored variables. A discussion of findings follows to promote the need for future research on this topic.*

Key Words: Due process hearings, City Local Education Agencies, Pennsylvania, COVID

The Individuals with Disabilities Education Act (IDEA) is federal legislation with the purpose of providing services to ensure that students with disabilities receive a free and appropriate public education (FAPE). Through special education, Early Intervention, and rehabilitation services, these students are trained to live independently, find meaningful employment, and continue receiving post-secondary learning opportunities, upon leaving the high school setting (United States Department of Education, 2024). If a student and their family feel their rights under the IDEA have been violated, they may seek legal action in a special education due process hearing. In such a legal proceeding, parties may call on witnesses and present evidence. The appointed hearing officer reviews all the presented materials and then provides a judgment on the disputed matter through a written decision. The decision offers guidance as well as any remedies owed by the parties involved. As a written legal document, the decision must be followed by all parties involved in the hearing (Office for Dispute Resolution, 2023).

The Office of Special Education Programs (OSEP) states that hearing officer decisions can only be studied for the purposes of identifying training needs for Locale Education Agencies (LEAs), State Education Agencies (SEAs), and hearing officers (Zirkel & Vander Ploeg, 2019). Prior to the COVID-19 Pandemic, there was extensive scholarship on trends in special education due process hearings at both the state and national level. Family legal representation (Hoagland-Hansen, 2015) raised issues of IDEA compliance (Blackwell & Blackwell, 2015; Schanding et. Al, 2017), and forms of requested remedies (Blackwell & Gomez, 2019), were just a few subjects of analysis relating to this topic.

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There is a two-year statute of limitations for raising complaints relating to improper implementations of special education services provided through the IDEA (20 U.S.C. Sec. 1415(f)(3)(C).). Legal experts have stated that pandemic related IDEA compliance issues could be filed as late as March 2022 (Spar, 2022). Before the COVID-19 Pandemic, the Commonwealth of Pennsylvania was among the most litigious states in disputes over matters of IDEA compliance (Blackwell & Gomez, 2019). The first year of the pandemic saw this trend continue (Center for Appropriate Dispute Resolution in Special Education, 2023). What remains unclear is what, if any, influence the pandemic was having on hearing officer decisions in the Commonwealth. The present study explores this phenomenon by comparing published hearing officer decisions involving Pennsylvania city LEAs, for the two years before and after the pandemic.

Literature Review

For the first year of the COVID-19 Pandemic at the national level there were less written due process complaints and meditations than in previous school years (The Office of Special Education and Rehabilitative Services, 2023). Across the United States, the failure to implement a FAPE was the most common issue raised by students and their families in post-pandemic hearings. On this issue, hearing officers were more likely to rule against schools (Zirkel, 2023). Multi-state samplings showed less special education due process hearing decisions occurring in the 2020-2021 school year when compared with pre-pandemic years (Zirkel & Jones, 2020; Zirkel, 2021).

Pennsylvania Special Education Due Process Trends

For the 2020-2021 school year 307,594 Pennsylvania students between the ages of 6-21 qualified for specialized services under the IDEA (Pennsylvania State Data Center, 2022). During the COVID-19 Pandemic mandated school closures, the Pennsylvania Department of Education and Bureau of Special Education issued the following statement regarding the responsibilities of LEAs to students with disabilities transitioning to online learning platforms:

> "Local education agencies (LEAs) must provide a free appropriate public education (FAPE) consistent with the need to protect the health and safety of students with disabilities and those individuals' providing education, specialized instruction, and related services to these students. Due to the COVID-19 pandemic, LEAs may not be able to provide all services in the same manner they are typically provided. In these instances, LEAs should work to ensure that a student receiving special education services is continuing to be provided with FAPE, as appropriate and reasonable for each student's circumstances. Educational and related services and supports may need to be adjusted accordingly" (2020, p.1).

While the services provided had to be adjusted due to the mandated in person learning closures, the IDEA requires that parents be notified of such changes and offered the right to contest them. Notice of Recommended Educational Placements (NOREPs), IEP meetings, and other procedural compliance mandates of the law still needed to be followed (Disability Rights Pennsylvania, 2020). Due to limited internet connectivity and lack of technological resources, teachers in the Commonwealth of Pennsylvania indicated they were unable to provide students with disabilities appropriate accommodations as outlined in their IEPs during the COVID-19 Pandemic mandated closures (Lipscomb et al., 2021).

Since the pandemic, Pennsylvania continues to be among the states with the most dispute resolution activity in matters related to IDEA compliance (Center for Appropriate Dispute Resolution in Special Education, 2023). In the Commonwealth of Pennsylvania, the Office for Dispute Resolution (ODR) is the facilitator of special education due process hearings. When discussing Pennsylvania hearing officer decisions from after the pandemic, ODR acknowledges that the data from those years are not representative of patterns from the previous five years. ODR also make note of limitations in their presentation of hearing officer's ruling outcomes and geographic locations for LEAs involved in hearings (Office for Dispute Resolution, 2023).

Regarding hearing officer ruling outcomes, the following statement is made by ODR in their 2021-2022 annual reporting:

> "After a decision is issued, the hearing officer categorizes the result for purposes of the Annual Report. This is not a precise calculation; the hearing officer has to use his or her best judgment in assessing whether the decision supports the parent or the LEA" (p.45).

The Pennsylvania Department of Education's website lists all LEAs by Urban/Rural classification (2023). This classification uses a system incorporated by the National Center for Education Statistics (NCES). LEAs can be put into four primary categories: city, suburban, township, or rural. City LEAs have three subtypes: small, midsize, and large (Geverdt, 2019). Prior to the pandemic, Pennsylvania suburban schools contributed more special education hearing activity than city and rural LEAs in the Commonwealth (Nowicki, 2019). Literature indicates that this trend has continued since the pandemic (Rush, 2024).

While collectively, suburban schools contributed more activity, a city LEA is responsible for the most appearances in due process hearings. In their fiscal reporting for the year 2021-2022, ODR indicates that the School District of Philadelphia (SDP), located in the southeastern region of Pennsylvania, provided the most due process hearing activity. The following statement is issued on the subject: "For the past twenty years, due process activity has been predominantly centered in the southeastern part of the Commonwealth and FY 2021 is no exception despite the intervening pandemic shutdown in March 2020" (p.42).

Violations of the IDEA during the pandemic lead to a complaint being filed with the Bureau of Special Education on behalf of all students with disabilities enrolled in the SDP. In the initial complaint it was alleged SDP had failed to offer students FAPE during the 2020-2021 School year. Upon further investigation of the issue, the Pennsylvania Department of Education determined that SDP not only failed to remedy the loss of FAPE, but also preformed inappropriate evaluation practices, failed to conduct IEP meetings in a timely manner, and did not adhere to the standards of appropriate progress monitoring of goals (Wakelin et. al, 2023). Another Pennsylvania city LEA, the Pittsburgh Public School system, owes over 7,000 students more than 600,000 hours of special education services for IDEA violations during the pandemic (Forstadt, 2024).

Due to the recent nature of the pandemic, there has been limited scholarship examining the effect it has had on special education due process hearings. While preliminary reports have been conducted at both the state and national level, questions still remain. At the local level, the pandemic's influence on hearings involving Pennsylvania city LEAs is unexplored. Despite indication of numerous IDEA violations during the pandemic, and frequent appearances in hearings by SDP, there has been limited analysis as to how the pandemic has affected special education due process hearings involving city LEAs in the Commonwealth of Pennsylvania.

PRESENT STUDY

Due to the recent nature of the pandemic, there has been limited scholarship examining the effect it has had on special education due process hearings. While preliminary reports have been conducted at the state and national level, questions remain. At the local level, the pandemic's influence on hearings involving Pennsylvania's city LEAs is an unexplored topic. Literature indicates that Pennsylvania's two largest city LEAs struggled to stay within compliance with the IDEA during the pandemic. While ODR reports that SDP had the highest frequency of hearing activity during the pandemic, it is unclear whether this event is influencing hearing officer decisions involving city LEAs in the Commonwealth.

By reviewing such factors as frequency of appearance, hearing officer ruling outcomes, and owed remedies urban educators can better understand how the pandemic is shaping modern hearings involving Pennsylvania city LEAs. A discussion of findings can inform these schools of any needed training or support related to IDEA compliance. This in turn aligns with the OSEP guidelines that hearing officer decisions only be reviewed for the purposes of identifying training needs. To address the current research gap, the present study examines the following research questions:

> Were city Pennsylvania LEAs involved in more hearings after the COVID-19 Pandemic?
>
> Was there a relationship of significance between hearing officer ruling outcomes and the *COVID-19 Pandemic* for city Pennsylvania LEAs?
>
> What remedies were city Pennsylvania LEAs held responsible for providing students since the COVID-19 Pandemic*?*

METHODOLOGY

The current study seeks to examine the influence the COVID-19 Pandemic had on special education due process hearings involving city LEAs in the Commonwealth of Pennsylvania. This requires a research method that offers retrospective analysis of previously occurring events. To accomplish this, an ex-post facto research design will be implemented. A quasi-experimental methodology, in this design dependent variables are proposed (ruling outcomes, owed remedies, frequency of appearance) and then an already occurring event (a special education hearing) is reviewed to determine its effect on them (Sharma, 2019).

DATA SOURCE

In the Commonwealth of Pennsylvania, ODR facilitates all dispute resolution activity relating to disagreements over individual's rights protected by the IDEA. On their website is a publicly available set of written hearing officer decisions from impartial hearings that have occurred in the Commonwealth since 2006. Before making the decisions available for public review, information that could identify students involved in the hearings is redacted. As stated on their website: "Since 2006, the Office for Dispute Resolution has made hearing officer decisions available to the public on this website. Before these decisions are posted, all identifiable student information is removed to maintain confidentiality" (Office of Dispute Resolution, 2023, para. 1).

The data sources for this study are all published due process hearing officer decisions uploaded between March 16, 2018, and March 15, 2022, involving city LEAs in the Commonwealth of Pennsylvania. There are 347 publications available for download between these two dates. Of these 347, there are twenty-four instances in which duplicates of the same publication had been mistakenly uploaded. This leaves 323 hearings to review. Since all collected data in this study comes from publicly available sources, and no experimentation on living subjects is occurring, there is no need for Institutional Review Board (IRB) approval.

Data Collection and Analysis

Each of the 323 decisions will be divided into COVID-19 groupings. At the top of each decision is the school's name involved in the hearing. Schools that do not meet the criteria of a city LEA will be removed from the sample. Once only city LEA decisions are left, they will be analyzed for ruling outcomes and remedies owed. The first research question will be answered by creating frequency distributions of pre- and post-COVID-19 hearing decisions. Comparisons will be made to determine whether more hearings were uploaded to the ODR website for the two years before or two years after the pandemic. To answer the second research question, a chi-square test will be implemented to determine if a relationship of significance can be established between pre- and post-COVID-19 decisions and hearing officer ruling outcomes. The final research question will be answered by reviewing the types of remedies owned by city LEAs in the post-COVID-19 sample.

Definition of Variables

City LEAs. The Pennsylvania Department of Education's website lists all LEAs by Urban/Rural classification (2023). This classification uses a system incorporated by the National Center for Education Statistics (NCES). In this system, LEAs can be put into four primary categories: city, suburban, township, or rural. City LEAs have three subtypes: small, midsize, and large (Geverdt, 2019).

Before and After COVID-19. ODR lists March 16, 2020, as the official date the pandemic forced their offices to shut down in-person services (2020). Since this date can be referenced and cited, it serves as the cut-off point for before and after the pandemic. Hearing officer decisions uploaded within the two full years before March 16, 2020, will be labeled as pre-COVID-19 hearings. Decisions from two years after this date will be named post-COVID-19 hearings.

Hearing Office Ruling Outcomes. At the end of all published due process hearing decisions, the hearing officer issues a ruling. In their 2015 article, Zirkel and Skidmore introduce a five-point scale "completely in favor of the parent, largely in favor of the parent, inconclusive/ and or split decision, largely in favor of the school district, and completely in favor of the school district" (p.545). The present study uses a similar scale but makes small modifications. The following variable names will be used in replacement of the Zirkel and Skidmore ruling outcomes.

Full Student

In this ruling outcome, the hearing officer sides with the student and their family on all matters raised.

Mostly Student

In this ruling outcome, the hearing officer sides with the student and their family on most of the matters raised, however does not grant all the requests. Such rulings have statements such as "In favor of the student on all but", "Mostly in favor of", "All requests will be granted but".

In Part for both Parties or Inconclusive

In this ruling outcome, the hearing officer rules in part with the student and their family and in part with the school district. For the purposes of coding, any time a hearing officer ruling states the words "in part" then the ruling was coded as this type of outcome. This outcome was also used for any inconclusive rulings, or no ruling was given at all.

Mostly LEA

In this ruling outcome, the hearing officer sides with the LEA on almost all of the raised issues. However, one or more requests are granted to the student and their family. An example of such a ruling outcome would be if the hearing officer found that the LEA did not violate the student's right to a FAPE, however they still wish to order an Independent Education Evaluation (IEE) at the public's expense to be thorough in their decision. For the purposes of coding for such ruling's statements to the likes of :"I find in favor of the schools on all matters but", "All of the family's requests must be denied except", "While there was no denial of FAPE, I will still order an IEE", or "I find in mostly in favor of the school".

Full LEA

In this ruling outcome, the hearing officer denies the family's requests on all raised matters. Statements to the likes of: "All of the families requests must be denied" or "In favor of the schools" are issued for such rulings.

Owed Remedies. In the present study three forms of remedy are: Independent Educational Evaluations (IEEs), compensatory education, and financial reimbursements. For the purposes of this study, if the LEA owed a remedy, then it was notated as such. For instance, a student could be denied reimbursement for attorney fees but granted it for their tuition. In this situation, the school owes tuition. An LEA owed an IEE as a remedy if the hearing officer ordered at least one type of assessment or evaluation administered by an expert evaluator not associated with the school but paid for at the public's expense. Owing a reimbursement occurred if the LEA had to repay a purchase for a previously obtained service. Finally, any time a specific hourly allotment of owed educational services was mentioned as a form of owed relief, compensatory education was owed by the LEA.

RESULTS

Among the 323 hearing officer decisions, sixty-five involved schools that meet the classification of city LEAs under the Pennsylvania Department of Education. The first research question examined whether there was more hearing activity involving Pennsylvania city LEAs before or after the pandemic. There were thirty-six decisions uploaded before the pandemic. These decisions were coded as pre-COVID-19 decisions. The results show that there was more activity before the pandemic than after.

There were five ruling outcomes that a decision could be coded as having. Table 1 shows a distribution of these ruling outcomes for pre- and post-COVID-19 groupings. Pre-COVID-19 decisions had the following distribution for rulings: full student in ten decisions, mostly student in one decision, in part for eleven decisions, mostly LEA in two decisions, and full LEA in the

remaining twelve. For the twenty-nine post-COVID-19 decisions the following distribution was found for rulings: full student for eleven decisions, mostly student in two decisions, in part for ten decisions, and full LEA in the remaining six decisions.

The second research question attempted to determine a relationship between the pandemic and hearing officer ruling outcomes. When reviewing the chi-square test results, the X2 value was 3.718 with a *p-value* of 0.446. To establish that there was no relationship of significance between ruling outcomes and the *COVID-19* groups, the p-value needed to be greater than .05. Since the p-value was greater than .05, there was no rejection of the null hypothesis, and no relationship existed. Table 2 shows the results of the chi-square test.

Table 1

Pennsylvania City LEAs' Ruling Outcomes Before and After COVID-19 (n=65)

COVID-19	Outcome					Total
	Full Student	Mostly Student	In Part	Mostly LEA	Full LEA	
Pre	10	1	11	2	12	36
Post	11	2	10	0	6	29
Total	21	3	21	2	18	65

Table 2

Chi-Squared Tests

	Value	df	p
X^2	3.718	4	0.446
N	65		

The final research question seeks to determine what forms of remedy city LEAs are responsible for providing after the pandemic. There were twenty-nine decisions that occurred after the pandemic. As displayed in Table 3, five decisions found LEAs responsible for providing at least one form of IEE as a remedy. In six decisions, LEAs had to provide a form of reimbursement. Finally, in sixteen decisions, LEAs owed compensatory education services.

DISCUSSION

In multi-state samplings of due process activity for the 2020-2021 school years, pre-COVID activity was higher than post-COVID (Zirkel & Jones, 2020; Zirkel, 2021). The current study attempted to learn if the COVID-19 Pandemic was influencing trends in special education due process hearing decisions involving city LEAs in the Commonwealth of Pennsylvania. The results of the current study show that city LEAs appeared in special education due process hearings less often after the COVID-19 Pandemic than before. In the current study, twenty-nine decisions met the criteria of being post-COVID. Under the utilized methodology, these decisions were

Table 3

Remedies Owed by Pennsylvania City LEAs Before and After COVID-19

COVID Group	IEE	Comp Ed	Reimbursement
Pre	11	14	8
Post	5	16	6

uploaded in the two years after the mandated office closures associated with the pandemic. When accounting for hearing officer ruling outcomes, there is no relationship of significance that can be established with the pandemic. Other than a small rise in compensatory education as an owed form of remedy, reimbursements and IEEs are being ordered less since the pandemic for Pennsylvania city LEAs. Of the thirty-six pre-*COVID* hearings, there were fourteen decisions of which most or full favor could be associated with the LEA. For the twenty-nine post-*COVID* hearings, only six hearings had these ruling outcomes.

As of 2024, the two largest Pennsylvania city LEAs, still owe compensatory education services to thousands of students. Recent reporting states the School District of Philadelphia (Graham, 2024) and Pittsburgh Public Schools (Forstadt, 2024) have failed to offer students mandated compensatory education related to IDEA violations occurring during the pandemic. While the current study indicates more hearing activity occurring prior to the pandemic than after, these failures to provide mandated compensatory education by two prominent city LEAs may lead to changes in post-COVID hearing trends. Nationally, the failure to implement a FAPE was the most common compliance issue raised by students in post-COVID hearings (Zirkel, 2023). When reviewing literature on trends in special education due process, raised issues of IDEA compliance can vary significantly based on the state in which the hearing occurred (Blackwell & Blackwell, 2015; Rush, 2022). The failure to implement a FAPE was the most common compliance issue raised by students in post-COVID hearings nationally, however this may not be the case for a sample that features only city LEAs in the Commonwealth of Pennsylvania.

Legal scholars have stated that the date for filing complaints related to pandemic induced IDEA compliance issues is passed. Despite this, some families are still raising these issues in hearings (Zirkel, 2023). Analysis of hearing officer decisions should help in displaying training needs (Zirkel & Vander Ploeg, 2019). While the current study focuses on the perspective of LEAs, future research on the subject could shift the attention to the students and their families. Analyzed variables in future research could include the grade level of the student, their disability classification, and whether they used an attorney or represented themselves pro-se. By expanding the sample size, reviewing variables related to the students, and focusing on raised issues of IDEA compliance, this goal can be achieved.

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Microteaching in Teacher Education: Greek University Students Appraise Their Experience

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Abstract: *Microteaching—an innovative teaching method in which students deliver a mini-lesson to a small group of peers within a limited timeframe to develop specific teaching skills and refine pedagogical behaviors—has been implemented in teacher education and training for half a century. This qualitative study explored the views of 10 graduate students regarding their experiences with microteaching during their undergraduate studies in a Greek pedagogical university department. Data were collected through free-texts composed by participants as a research tool and analyzed using qualitative content analysis. The findings revealed that graduate students held a positive stance toward microteaching, emphasizing its benefits and its positive impact on teachers' teaching skills and professional development. These results further reinforce the need for integrating microteaching into teacher education and training programs.*

Key Words: microteaching, teacher education and training, university students, qualitative research, qualitative content analysis

Well-prepared and qualified teachers who serve as reflective professionals are a prerequisite for providing quality and effective education to new generations. At the same time, initial teacher education programs need to tackle the hazard of becoming overly theoretical and disconnected from actual teaching. Therefore, these programs should find ways to offer authentic and pertinent knowledge and experiences to aspiring teachers, enabling them to apply what they learn in practice (Karlström & Hamza, 2018; O'Flaherty et al., 2024).

Microteaching, as an innovative instructional method, has contributed to these ends- enhancing teachers' professional development, preparing them first for their practicum and later for their actual teaching practice, and linking theory and practice in teacher education and training programs- for almost half a century since its appearance, which traced back to 1963 at Stanford University (K. Chatzidimou, 2013; Ismail, 2011). After its first implementation and with many format variations to the original, the spread of microteaching was rapid in many countries and continents worldwide, having been incorporated into teacher education and training curricula and having been the center of attention for researchers (Hamidi & Kinay, 2021; MacLeod, 1995).

Microteaching is a teaching technique and laboratory-type exercise in which a student or trainee teacher practices specific and limited teaching skills and pedagogical behaviors, thereby improving his/her pedagogical training in lesson planning, instructional delivery, and the evaluation of teaching effectiveness. In particular, he/she is required to teach a simplified and

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condensed -compared to conventional school classroom teaching in terms of content, duration, and audience size- lesson. More precisely, he/she undertakes to conduct a mini-lesson lasting from 5 to 20 minutes to a small group of peers (typically 5-10 individuals)[1] (D. Chatzidimou, 2003).

Microteaching takes place in a well-equipped laboratory with teaching aids and educational materials. The lesson is videotaped to facilitate subsequent analysis and critical reflection, at the end of the process, by the practicing teacher, his/her colleagues, as well as by the supervisor, who guides him/her throughout the process. On the same or another day, microteaching is conducted again by the practicing or trainee teacher to avoid his/her mistakes and improve (D. Chatzidimou, 2003).

Although the method of microteaching has been subject to criticism -for example, it was argued that being an expert in specific teaching skills does not lead to teacher effectiveness, while the transferability of cultivated skills to real classroom settings was also questioned (Cavanaugh, 2022)- a substantial body of research over the years has demonstrated its positive impact and effects. For example, research evidence suggests that microteaching has enhanced students' skills in lesson planning and classroom management, prepared them for teaching, increased their motivation and self-confidence, and fostered professionalism and reflective practice (O'Flaherty et al., 2024).

Consequently, a recurrent theme across these studies, which have shown its merit, is the call for its widespread integration into university curricula for both pre-service and in-service teacher training (D. Chatzidimou, 2003; K. Chatzidimou, 2013; Fischetti et al., 2022; Ismail, 2011; Masali & Kougiourouki, 2021). Likewise, prospective teachers admitted to having positive perceptions of microteaching, acknowledging that it has helped them gain teaching experience and has positively contributed to their professional development (Cebeci, 2016; K. Chatzidimou, 2011; Hamidi & Kinay, 2021; Özonur & Kamışlı, 2019). However, there were also students having viewed microteaching as "fake teaching" as well as they felt uncomfortable and stressed while teaching their classmates (Bell, 2007). Elsewhere, it has also been noted that, while some trainees find the microteaching experience enjoyable, others find it as a challenging process of preparing to become teachers (Koross, 2016).

Taking these diverse perspectives into account, this study aspires to contribute to the existing body of research on students' perceptions of microteaching, attempting to shed new light on whether microteaching has merit for prospective teachers' professional development and if it serves their expectations and needs. The findings regarding trainees' concerns and experiences may inform teacher education programs, enabling them to enhance the efficacy and impact of microteaching.

METHODOLOGY

CONTEXT OF THE CURRENT STUDY

Microteaching started to be implemented in the Department of Primary Education at the Democritus University of Thrace in 1992, thanks to the efforts of Emeritus Prof. Dr. Eleni Taratori (Kougiourouki, 2003). It constitutes a mandatory semester course that precedes pre-service teachers' practicum, which takes place in the final year of their four years of studies. The microteaching model applied in this Department was developed and established by Emeritus Prof.

[1] Depending on the model being used, there are differences in the audience size and duration of microteaching (O'Flaherty et al., 2024).

Dr. Dimitris Chatzidimou, who was also the first to introduce microteaching at a university level in Greece, specifically at the Aristotle University of Thessaloniki.
According to this model, the microteaching course follows a structured three-stage process:

1. For the first 6 hours, students are theoretically inducted into microteaching by the supervisor professor. They learn about the aims of microteaching as well as specific pedagogical and teaching skills (e.g., how to start and end a lesson, use teaching aids, manage time, select and formulate instructional objectives), which they will have to exercise and apply during their micro-lesson. A broad discussion is held regarding lesson planning, specific teaching skills, forms, behaviors, and aids; while a microteaching lesson from a previous year is also viewed and analyzed.
2. Each trainee teaches a mini-lesson with one or two instructional objectives for fifteen minutes to their fellow students in a fully equipped laboratory. The lesson is videotaped and then watched on TV. A comprehensive analysis follows, involving self-assessment, peer feedback, and evaluation by the supervisor-professor; where effective strategies and implementations are lauded while suggestions for improvement are made.
3. The microteaching course concludes with a discussion between the supervisor and practicing students, during which students share their views on the value of the course, discussing both its strengths and limitations. Unfortunately, there is no chance to re-plan, re-teach, and re-evaluate each student's lesson, as it typically should be done, because of the large number of students in the Department and the lack of time (K. Chatzidimou, 2013).

DATA AND ANALYSIS

The current small-scale qualitative study was conducted in January 2024. Its main purpose was to explore the views of 10 graduate teachers regarding their experiences with microteaching during their undergraduate studies. Thereby, the study sought to determine the contribution of microteaching to teacher preparation and professional development, as well as its significance within teacher education programs. This objective, along with the diverse experiences of students with microteaching, as documented in the literature and mentioned earlier, led to our concern about the selection of an appropriate research tool—one that would allow the spontaneous and sincere opinions of the participants to emerge while minimizing the influence of the researcher. Free-text writing meets these criteria and was therefore chosen as the research tool for this study (Stravakou, 2019).

Graduates of the Department of Primary Education at the Democritus University of Thrace were invited to participate voluntarily after having been informed about the research purpose and their right to withdraw from the study at any time (Cohen et al., 2008). Participants were asked to compose a spontaneous text of at least 500 words on the topic: *"My experience with microteaching during my undergraduate studies"*. They then submitted their texts via email to the researcher and author of this article. No additional instructions, explanations, or clarifications regarding the writing process were provided.

The study employed purposeful criterion sampling to include only graduates who had completed the microteaching course in this Department (Patton, 1990). The rationale behind recruiting graduate students was their more holistic view regarding the impact of microteaching on their teaching competence and professional experience since they had completed both the

microteaching course and their practicum. Furthermore, at the time when the research was conducted, they were either pursuing postgraduate studies and/or had begun their teaching careers, which further enabled them to assess the relevance and applicability of their microteaching experience. The research material was collected in February 2024, and the sample consisted of 10 graduate students.

The selected research method for analyzing the research material was qualitative content analysis, which allows the description of the material in a reductive, flexible, yet systematic manner (Schreier, 2012). The specific stages of the qualitative content analysis were the following:

1. Participants' texts were read several times for their content to be thoroughly understood. The unit of analysis was determined to be a word, phrase, or sentence relevant to microteaching. Relevant excerpts were identified and extracted based on the established unit of analysis.
2. The extracted material was subsequently categorized, and the categories and sub-categories were formed. The prerequisites of mutual exclusiveness, unidimensionality, saturation, and exhaustiveness were met for the formation of the system of (sub)categories.
3. The findings were then qualitatively described and annotated as follows (Schreier, 2012; Stravakou, 2019).

FINDINGS

From the qualitative content analysis of participants' texts regarding their experience with microteaching during their undergraduate studies, six main categories emerged, each having a code figure (K). These categories are presented in Table 1.

Table 1

Categories Emerging From Qualitative Content Analysis

Categories (K)
Characterizations of microteaching (K1)
Perceived benefits of microteaching experience (K2)
Cultivated skills through microteaching (K3)
Supervisor's role being decisive in successful microteaching execution (K4)
Classroom management skills not cultivated through microteaching (K5)
Drawbacks and limitations of microteaching (K6)

CHARACTERIZATIONS OF MICROTEACHING (K1)

Graduate teachers expressed their views on microteaching with enthusiasm, describing it in several ways and sharing a range of impressions, as can be seen in Table 2.

Carrying out a mini-lesson within a strictly limited timeframe, following specific and defined stages, and delivering it to their fellow students seemed like a weird process to the graduate students who participated in the study. The process was also perceived as novel since, prior to their participation, they had no previous knowledge of microteaching and were encountering it for the first time:

Table 2

Characterizations of Microteaching (K1)

Characterizations
Strange process
Novel process
Very interesting experience
Useful process
One of the most enjoyable university experiences
Stressful process
Structured and standardized process
The basis and prerequisite for practicum

> *It felt strange to me to conduct a mini-lesson in less time than the classic forty-five minutes to one or more people. It was the first time I had heard about microteaching* (Participant 1)

> *Teaching for a fixed duration with our fellow students and the supervisor as an audience, while having to meet very specific specifications and adhere to rules and specific boundaries, was a very different process, strange, and weird* (Participant 7)

Despite their initial contact with microteaching, participants found it to be a very interesting and useful method, as it provided them with their first exposure to their future profession, helping them gain preliminary teaching experience while equipping them with the necessary skills to carry it out. That's why several participants found this initial hand-on engagement to be one of the most enjoyable university experiences during their studies:

> *The course was very helpful and interesting for my future career as a teacher because it helped me acquire many teaching skills and gain insight into what it is like to teach in reality.* (Participant 3)

> *For me, the microteaching course was my first contact both with microteaching and the teaching process as a student. This experience was one of my most enjoyable experiences at university, as it brought me closer to the reality and daily life of a professional and reflective educator.* (Participant 4)

However, for some participants, this first attempt to put teaching into practice seemed quite stressful:

> *On a psychological level, there was anxiety about completing and presenting my lesson in the classroom and whether I had met the course requirements*. (Participant 5)

Yet, some others pointed to the fact that microteaching is a standardized process, which they required to follow to the letter:

> *It was a highly standardized process, and everyone had to follow a specific sequence of steps.* (Participant 3)

A recurring theme in participants' texts was the preparation microteaching provided for their subsequent practicum, where they engaged in teaching within school settings with real students. That is why they characterized it as the foundation and prerequisite for their practicum, emphasizing the necessity of its placement before the practicum experience:

> *It was an essential course for us to learn how to teach and carry on with the knowledge and experience gained in the practicum course*. (Participant 3)

> *It laid the ground for the upcoming practicum. I therefore believe that it is aptly implemented before the start of the practicum as it contributes to students' professional development.* (Participant 10)

PERCEIVED BENEFITS OF MICROTEACHING EXPERIENCE (K2)

As shown in Table 3., research participants gained various and multiple benefits from microteaching.

Table 3

Perceived Benefits of Microteaching Experience (K2)

Perceived benefits
Gaining experience by applying theoretical knowledge in practice
Acquaintance with teaching
First teaching attempt in a controlled environment with room for error
Improvement through self-assessment, peer assessment, and observations of others' teaching
Increased motivation for the profession
Establishing their suitability for a teaching career
Familiarity with public exposure

Graduate students clearly expressed that microteaching served as a bridge between the traditional dichotomy of theory and practice, helping them become acquainted with their future teaching reality. The standardized nature of microteaching, which follows specific steps, facilitated the consolidation of theoretical knowledge and its practical application for the execution of effective teaching. Moreover, the simulated laboratory environment, as opposed to a real classroom setting, provided trainees with the opportunity to experiment, make attempts, and learn from potential mistakes without the risk of causing irreversible negative consequences for real students. Additionally, microteaching contributed to students' motivation to teach, helped them

overcome stress and fear of public speaking and get comfortable with public exposure. It also fostered improvement through self-assessment, peer assessment, and the observation of others' lessons. Ultimately, microteaching enabled participants to assess their suitability for the teaching profession:

> *The benefit was that you were trying to apply what you had learned In a protected environment, with room for error, and with an audience that could offer insightful criticism and ideas to seriously consider for improvement. Additionally, you observed the work of others, gained ideas, and engaged in discussions that benefited both the presenter and the observers, who could then incorporate the feedback into their own instruction.* (Participant 5)

> *I also became accustomed to public exposure, which was a new experience for me. As I am a naturally shy person, microteaching helped me overcome my fear of being in front of an audience.* (Participant 8)

> *The requirement for all to follow very specific steps in conducting microteaching helped "instill" in my mind what I need to do to teach effectively* (Participant 9

CULTIVATED SKILLS THROUGH MICROTEACHING (K3)

Similar to the reported benefits, participants identified a variety of skills they acquired and developed through their experience with microteaching (see Table 4).

Table 4

Cultivated Skills Through Microteaching (K3)

Cultivated skills
Systematic lesson planning
Lesson execution
Implementation of various teaching methods
Selection and formulation of suitable instructional objectives
Use of teaching aids
Self-assessment and self-criticism regarding teaching effectiveness
Stress management as novice teachers
Time management
Formulating and asking questions
Critical thinking through self-assessment and peer-assessment

These skills primarily revolve around teaching methodology, where students learned to organize and carry out a lesson effectively, apply the various teaching methods they had learned, use teaching aids, formulate and ask questions, select and formulate instructional objectives, manage available time for instruction, and assess and critique the effectiveness of their teaching:

> *Proper time management was a very important goal that we all had to focus on and achieve, and this was accomplished with the guidance of our supervisor.* (Participant 2)

> *Through the selection of instructional objectives, I learned to distinguish and use the appropriate verbs related to students' knowledge, attitudes, and skills for formulating the objectives for the unit I required to teach. It also helped me to effectively use teaching aids and formulate appropriate questions.* (Participant 4)

> *The microteaching course taught me how to organize, prepare, and deliver a lesson, applying the teaching methods we had learned.* (Participant 7)

Some students also stated that microteaching helped them manage the stress they experienced as novice teachers:

> *Microteaching helped me significantly to overcome some of the anxiety I felt about teaching an audience for the first time.* (Participant 10)

According to several participants, the feedback they received during discussions with their peers and the supervising professor, along with the self-assessment they conducted after delivering the lesson, contributed to the development of their critical thinking skill:

> *In addition, I developed my critical thinking through self-assessment and feedback with corrections to optimize instruction.* (Participant 8)

SUPERVISOR'S ROLE BEING DECISIVE IN SUCCESSFUL MICROTEACHING EXECUTION (K4)

Participants emphasized the crucial role of supervisor in the effective execution of microteaching. They particularly highlighted the supervisor's positive and supportive attitude, guidance, practical advice, and constructive critique as crucial factors:

> *Our supervisor/professor was very helpful. I distinctly remember her targeted observations, supported by arguments and examples, which helped us correct, as well as the understanding she showed to us regarding the course requirements. She was always warm, cheerful, and open to our questions and concerns.* (Participant 1)

DRAWBACKS AND LIMITATIONS OF MICROTEACHING (K6)

Contrary to the many advantages mentioned by participants about microteaching, three disadvantages of the method emerged from the research material, as shown in Table 5.

The graduates who participated in the research identified the ideal context and its ideal conditions as a key weakness and the main disadvantage of microteaching. Since microteaching takes place in a controlled laboratory environment in front of fellow students rather than in a real classroom with actual students, the conditions are idealized. This lack of exposure to real classroom dynamics and challenges prevented them from confronting the practical difficulties that

Table 5

Drawbacks and Limitations of Microteaching (K6)

Drawbacks and Limitations
The ideal context and conditions
Lack of exposure to real classroom practical challenges
Limitations on personal expression in teaching due to standardization

arise in school settings. Consequently, some participants expressed **their inability to develop through microteaching classroom management skills (K5).** Furthermore, the standardization of the teaching process led some to conclude that their personal teaching style and characteristics were stifled, since they were required to follow a prescribed set of stages and rules**:**

> *I did not realize in a realistic context the difficulties and limitations that can arise in a real classroom with young students. I did not face the management of a class, namely, I did not encounter behavioral difficulties, inappropriate behavior of children, or deficiencies in infrastructure that a school class or a school, in general, may have. Microteaching took place in an idealized context with ideal conditions for a prospective teacher.* (Participant 6)

> *We were all required to follow very specific steps for our mini-lesson. The final product that came out of the design was very similar to others, and thus lacked the personal element that each of us, as an educator, could have brought to it.* (Participant 7)

DISCUSSION AND CONCLUSION

The present study set out to explore graduate students' perspectives on their experience with microteaching during their undergraduate studies at a Greek pedagogical university Department.

Overall, the findings revealed that the graduates who participated in the study held a positive view of the microteaching method and shared largely favorable memories and experiences. This aligns with similar studies conducted internationally (Adhikari, 2020; Hamidi & Kinay, 2021; Ismail, 2011; Özonur & Kamışlı, 2019; Ralph, 2014).

Participants attributed a range of mostly positive characteristics to microteaching, highlighting its various benefits and the skills that they gained from it. They also emphasized the pivotal role of supervisor in guiding their successful microteaching practice. These findings are largely consistent with previous research conducted on students who experienced microteaching in the same Department and under similar conditions (D. Chatzidimou, 2003; K. Chatzidimou, 2013; Masali & Kougiourouki, 2021). This consistency can be attributed to the shared experience of students within the Department. Furthermore, it reinforces the long-standing recognition of the value and benefits of microteaching, which are recorded over time in the relevant studies.

From the overall findings, it became apparent that microteaching contributed to the preparation of teacher candidates for their professional field, to their pedagogical training - particularly in relation to the planning, execution, and assessment of instruction (Mukuka & Alex, 2024), to their professional development (He & Yan, 2011; Ralph, 2014), to their personal

development (Hamidi & Kinay, 2021), to familiarize themselves with teaching (K. Chatzidimou, 2013), to overcome the anxiety of public speaking (Bulut, 2024), as well as to gain more motivation for their future profession (Soraya et al., 2022). The findings also positively respond to how Departments that prepare and train future teachers can integrate activities that blend theory with practice (He & Yan, 2011; Ismail, 2011; Karlström & Hamza, 2019; Ralph, 2014). While some students admitted to feeling stress when teaching in front of their peers and supervisor -an understandable response as novice teachers- microteaching also helped them manage these anticipated feelings (D. Chatzidimou, 2003).

As far as the cultivated skills are concerned, these primarily pertain to teaching methodology (Masali & Kougiourouki, 2021). However, unlike similar studies that found that microteaching helped preservice teachers develop classroom management skills (Hamidi & Kinay, 2021), a finding also reported in studies involving pre-service teachers from the same Department as in our study (Masali & Kougiourouki, 2021), some participants in our study expressed the opposite. These participants justified their view by citing the artificial nature of microteaching and its "factitious" audience, which did not resemble children. They identified this as the method's weak point and major disadvantage.

This discrepancy concerning the development of classroom management skills could be attributed to the fact that previous studies focused on teacher candidates, while our study involved graduates who had already completed their practicum in schools. Furthermore, these graduates, at the time of the research, had either continued their studies at the postgraduate level and/or started working as teachers. Therefore, the most plausible explanation may be that the participants in our study, having experienced and recognized the complexity and intricacy of real teaching, as well as the different demands of an educational audience consisting of young students compared to the small group of adult peers who participate with a common purpose and under the supervision of a responsible professor, perceive microteaching as a simplified process that does not require the same classroom management skills as a real school setting (D. Chatzidimou, 2003). However, given that the research data were collected through written texts, which did not allow for an in-depth exploration of the participants' views that emerged in this study, future research could focus on graduates as the research sample and employ semi-structured interviews as a data collection tool to provide a more comprehensive understanding of the issue.

The artificiality of the process has been a recurring finding in studies focusing on pre-service teachers' perspectives on microteaching (He & Yan, 2011) and was also a shared concern among participants and teacher candidates in another study (Ralph, 2014). Still, the fact that microteaching primarily focuses on the behavioral aspect of teaching while neglecting its creative dimension, coupled with its mechanistic and simplified approach to teaching and learning, is a well-recognized limitation of the method in the literature and was also identified by the participants in the study. However, these limitations are inherent characteristics of the method, aiming to achieve its intended objectives. As previously noted, the purpose of microteaching is for trainees to practice and develop specific teaching skills and pedagogical behaviors, address particular pedagogical and instructional challenges, identify and overcome their weaknesses and difficulties, and improve their overall teaching and pedagogical competence, in order to be ready later for their profession. Beginner trainees can more effectively achieve these goals in a controlled environment that simplifies classroom teaching and allows for a stricter evaluation of its effectiveness (D. Chatzidimou, 2003).

On the other hand, the fact that microteaching is conducted in front of an audience composed of peers was emphasized by our participants as beneficial. In their first attempt to teach,

this setup allowed them to experiment without the fear that any mistakes would have negative consequences for real students (Kougiourouki, 2003). Furthermore, participants recognized their improvement, which stemmed from observing their peers' microteaching lessons, receiving feedback and critique on their own performances, and engaging in self-reflection and self-evaluation (D. Chatzidimou, 2003).

Ultimately, the benefits of microteaching far outweighed its disadvantages, underscoring its pedagogical value in teacher education and its positive contribution to teachers' pedagogical and instructional training (Ralph, 2014). To enhance the benefits of microteaching and mitigate the limitations inherent in its simulation, one suggestion is to conduct a second round of microteaching with real students, following the initial microteaching lesson with peers (Mukuka & Alex, 2024). This approach, which has also been suggested by students in previous research (K. Chatzidimou, 2013), could further strengthen the teaching experience and better prepare future educators for real classroom settings.

An important implication of this study is the need for microteaching to precede teacher candidates' practicum (He & Yan, 2011), as it offers essential preparation for the latter. Another key finding with practical implications for the faculty overseeing microteaching is supervisor's role. The guidance, positive stance, and openness of the supervisor were repeatedly emphasized by the graduate teachers in this study, highlighting the decisive impact of such support on the success of the microteaching experience. This finding also aligns with the existing literature (D. Chatzidimou, 2003).

Despite the limitations of the study, which concern mainly the small sample, the findings reinforce the literature on the value and importance of microteaching in teacher training and professional development. They also support the view that microteaching is an innovative teaching method in teacher education that ought to still be in fashion (K. Chatzidimou, 2011) and not fade away. Rather than fading away, microteaching should be integrated into the curricula of all Department dedicated to preparing future educators, as has been previously advocated by experts in the field (e.g. D. Chatzidimou, 2003).

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Colorado's Alignment to Reduced Educator Turnover Based on the Work of its Teaching and Learning Conditions Initiative

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Abstract: This 2022 policy evaluation explores the continually low (<60%) educator participation rate associated with the Teaching and Learning Conditions Colorado (TLCC) survey and the state's overall alignment with its 2008 goal, to reduce educator turnover and related student achievement gaps. Through an intrinsic case study and a pragmatic lens, interviews were conducted with eight superintendents and three non-heads of systems from across the region, including the charter community. Representing the intended end-user of the survey's intelligence, the paper examines their readiness for working conditions data, background in workplace leadership, direct experience with the TLCC, and their perspective on what is needed for their culture and future educators to significantly improve. Questions grounded in similar studies of Child Trends and FutureEd, and Reichheld's score of enthusiastic employee loyalty (eNPS) offered an understanding of the survey's relative lack of value to leaders. The policy evaluation theoretical framework of Theodoulou and Kofinis and the deductive data analysis strategies established by Stake were used to examine the data. The analysis found Colorado's administrative approach (and the greater K-12 system) to be out of sync with its policy goal. The primary suggestion is for the Department of Education to follow the transformative leadership example of North Carolina's survey (>90%) program.

Key Words: teaching and learning conditions, culture of continuous improvement, growth culture, administrative accountability and control, work organization

COLORADO'S ALIGNMENT TO REDUCED EDUCATOR TURNOVER BASED ON THE WORK OF THE TLCC

This 2022 policy evaluation of House Bill 08-1384 explores the continually low (<60% vs. >90%) participation rate associated with the Teaching and Learning Conditions Colorado (TLCC) Survey and the state's overall alignment with the policy goal to reduce educator turnover and related student achievement gaps. In its almost 14-year history, nearly half of public educators have not participated in the survey, and in a state where student achievement gaps have been a particular problem. Through an intrinsic case study (Stake, 1995) and a pragmatic lens (Patton, 2015), interviews were conducted with eight superintendents and three non-heads of K-12 systems from across Colorado to understand the lack of lack engagement better. The inquiries explored

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their readiness for working conditions data, background in workplace leadership, experience with the TLCC, and what they think is needed for their current culture and that of future leaders to significantly improve. Questions grounded in the studies of Child Trends (Soloman, et al., 2020) and FutureEd (Jordan & Hamilton, 2020), and Reichheld's (2003) employee Net Promoter Score of enthusiastic loyalty offered an in-depth understanding of the survey's lack of value and the corresponding alignment of the state to the policy goal. The evaluation theoretical framework of Theodoulou and Kofinis (2004) was applied to the analysis of the interview data (2004). Finally, the analysis was intended to support the significantly improved implementation of the TLCC through the state's increased alignment to its policy goal and to add to the limited research associated with "TELL" surveys nationwide. These initiatives are dependent on valid instruments and breakthrough partnerships between state education departments, leaders in the field, and leadership preparation programs to achieve transformational results over the long term. The research question that guided this study was: Based on the TLCC's continually low participation rate (<60%) and the policy goal of reducing educator turnover, how do system authorities representing K-12 communities across Colorado perceive the survey, its administration, and what underlies their attitude?

AN INTRODUCTION TO THE POLICY

In 2008, the Colorado House passed Bill 08-1384 concerning the improved retention of quality educators. In addition to providing stipends for nationally board-certified teachers and the creation of an international teacher exchange program, the act required the Department of Education to administer a biennial teaching and learning conditions survey of all public school educators in the state and make the results available to the public. In the words of the policy,

> *The teaching and learning conditions under which teachers practice their profession, though often overlooked, are essential elements of student achievement and teacher retention. These conditions must be systematically studied and addressed for Colorado to develop a critical mass of teachers who are well-prepared to teach and who will remain in the hardest-to-staff schools long enough to make a significant difference for students and their families.*

HB08-1384 is absent any corresponding capacity-building element (e.g., a partnership with the state's principal preparation programs or other leadership development authorities) to prepare K-12 leaders for the level of vulnerability necessary to use the public survey data to achieve long-term continuous improvement (2008).

The policy's passage followed a recommendation from the Alliance for Quality Teaching, a Colorado-based nonprofit that focused on quality teacher issues by engaging in research and policy advocacy. Their 2008 "Shining the Light II" study stated that teacher quality and increasing teacher retention were key to reducing Colorado achievement gaps. The report noted that the achievement gap was a particular problem in Colorado, and overall, there are few examples of significant improvement. The attrition rate in schools with an "unsatisfactory" school accountability rating (SAR) was more than double that of "average" schools. The group's report also stated that it cost Colorado districts approximately $10,000 to hire and train each new teacher (Endahl, 2008).

Colorado's first survey in 2009, called the Teaching, Empowering, Leading, and Learning (TELL) was based on North Carolina's example. Since 2001, the TELL has been replicated across

over twenty states (NCTWCS, 2022). Colorado's current TLCC school survey (including education support staff as of 2022) provides feedback on school and teacher leadership, instructional practices and support, professional development, facilities and resources, managing student conduct, time for collaborative instructional planning, facilities and resources, community support and involvement, and other supports. Third-party vendor Cambridge Education is contracted to host the survey online and produce each summary report of the findings. As of 2022, districts and schools must have at least 50% participation and at least five respondents to have access to their results and for the data to be published online. The survey service is operated through a statewide collaborative that includes the Colorado Education Association, Colorado Education Initiative, Colorado Association of School Boards, Colorado Association of School Executives, Colorado League of Charter Schools, Colorado Rural Schools Alliance, and representatives from school districts, universities, and researchers (TLCC, 2022). Participation in Colorado's TELL or TLCC has never reached 60%. There was no available information on the validity of the instrument, for example, whether high scores are significantly associated with low or reduced rates of teacher turnover. Only anecdotal data are available on how the results are being used by schools and districts, and superintendents and charter school directors are not specifically included in the continual improvement planning process (L. Meddler, personal conversation, June 23, 2021; L. Steffen, personal conversation, July 8, 2022).

Teaching and Learning Conditions and Related Improvement Planning

Research across the nation continues to document that improving teacher working conditions is strongly connected to improved student achievement (Daugherty, 2012; Hirsch, 2001; Ingersoll, 1999; Mobley, 1982; Murname et al., 1991; Price, 1977). For example, findings have shown that teachers' voice or authority is critical in making effective school and district improvement decisions. A study from 2011 to 2015 of approximately 900,000 respondents, 25,000 schools, and 16 states is that of the TELL survey project by Ingersoll and others. Their findings showed that students who go to schools where their teachers have a leadership role in decision-making perform substantially better on state tests. The data also suggested that faculty voice and control related to student behavior and discipline decisions were more consequential for student academic achievement than teacher authority related to selecting textbooks, choosing grading practices, and devising one's classroom teaching techniques. In summary, the data emphasizes the importance of teachers having a voice in creating the culture, climate, and ethos of their schools. Teacher authority in school improvement planning was also found to be significantly related to student academic achievement (Ingersoll et al., 2018).

Regarding the process of using teacher authority and working conditions data in school improvement planning, Meyers and VanGronigen found short-cycle and manageable task-oriented plans produced at least once each semester to be essential based on a review of hundreds of school improvement plans. By focusing on the small, over the big, and treating the plan as a "living" document that requires collaboration between teachers and leaders, the school can respond more quickly to real-time issues (Meyers & VanGronigen, 2021). Hanover Research explains how to go from the big to the small and distribute leadership authority through small school improvement groups based on their findings from a review of best practices literature and expert interviews on effective school improvement models (2014).

Lastly, the Teacher Voice Report shares four years of survey findings from 8,000 school staff on the terms necessary for effective school improvement planning and distributed leadership. The Eight Conditions are Belonging, Heroes, Sense of Accomplishment, Fun & Excitement,

Curiosity & Creativity, Spirit of Adventure, Leadership & Responsibility, and Confidence to Take Action. The presence or absence of these particulars in a school can depend in large part on how authority and power are exercised and distributed (Quaglia, 2015).

Administrative Accountability and Control; A Professional Form of Work Organization

In response to decades of relatively flat academic growth and record disinterest in the profession, international authority Andreas Schleicher recommended to U.S. education officials in 2018 that the nation move on from administrative accountability to a professional form of work organization where accountability comes from within in alignment with high-performing countries (NCEE, 2016; NCSL, 2016; Schleicher, 2018a; Schleicher, 2018b). Bowdoin College education chair Doris Santoro defines the need in more personal terms based on 10 years of interviews with K-12 public educators across the country. She has found that almost all teachers have moral reasons for getting into the profession. However, systemic pressures, such as top-down initiatives or punitive evaluation systems, can deplete their autonomy. As a result, they may feel they can no longer tap into what makes their work morally good, be frustrated or ashamed of their work, and ultimately, feel no longer capable of being good teachers (Santoro & Berliner, 2018). Her recommendation is very similar to Schleicher's, that schools must develop a strong core (as opposed to top) through a focus on authentic learning communities, where members share the same professional values.

To examine the general culture of the world's leading K-12 systems, those that excel in fostering quality and equity of learning opportunities for all, is to discover two drivers. The first is student academic resilience. As measured through the survey portion of the 2018 Program for International Student Assessment (PISA), students who disagreed or strongly disagreed with the statement: "Your intelligence is something about you that you can't change very much" scored 58 points higher in reading than students who agreed or strongly agreed with the statement, after accounting for students 'and schools 'socio-economic profile. US students scored comparatively high in growth mindset but average to low on other aspects of student academic resilience including perceptions of parent emotional support, the school's disciplinary environment, and beliefs in their own abilities. The second driver was transformational leadership. In most education systems examined by OECD, the likelihood of academic resilience among disadvantaged students was higher in schools with a more stable body of teachers and a leadership style more focused on clarifying the mission and directing teachers toward strategic goals and results, i.e., transformational leadership (OECD, 2018).

In closing, "professional accountability" refers to systems in which teachers are accountable not so much to administrative authorities at the top but instead to their fellow teachers and principals, primarily. Michael Fullan, an expert in transitioning compliance-oriented K-12 systems to systems of continuous improvement, has noted that programs do not scale; it is culture that scales. Culture is the hallmark of effective leadership (Schleicher, 2018b). Robert Kegan, a specialist in the field of related adult development, refers to this environment as one where the bottom line and the growth of all employees are seen as interdependent. "A growth-oriented culture [or culture of continuous improvement] enables people to value their growing edge and to experience themselves as still valuable even as they are screwing up, potentially even more valuable, if they can overcome [their] limitations, they are exposing" (Flaxman, et al., 2019; Kegan, et al., 2016). Lastly, the employee Net Promoter Score (eNPS) of enthusiastic loyalty is a common metric among organizations committed to professional accountability (Reichheld, 2003).

TEACHING AND LEARNING CONDITIONS SURVEY EVALUATIVE STUDIES

There are very few published studies on the effective use of school climate and/or culture surveys. Of the two that guided this study was the Child Trends' partnership from 2016 to 2020 with a group of public district schools and charter schools in Washington, DC. The project revealed five strategies that authorities can use when providing data to schools to ensure that their teams can use the information for decision-making including 1) reporting data promptly and in a format that supports data interpretation, 2) providing data-focused consultation or technical assistance to schools, along with training on data interpretation and data-informed decision making, 3) build buy-in for data use by ensuring that data are high-quality and reflect the needs of the school community, 4) engage multiple stakeholders in the review of the data, and 5) emphasize the utility of school climate data for improvement rather than for accountability (Soloman, et al., 2020). The second study concerned the Every Student Succeeds Act (ESSA), regarding states that chose to gauge school climate (and student engagement) as their School Quality and Student Success indicator. The analysis by Future Ed produced the following recommendations that state and local education agencies can take to ensure that climate data are used appropriately and lead to improved learning opportunities for students. 1) Weigh the trade-offs of accountability measures, 2) monitor survey effects over time, 3) support educators' use of climate data to inform practice, and 4) create conditions that produce high-quality survey results (Jordan & Hamilton, 2020). These findings from Child Trends and FutureEd were used to focus on the extent to which the state's implementation of the TLCC is aligned with its policy goal.

In closing, while none of the above literature references were found to be inspirational, the intention was for the disparate and shallow points to be, in their entirety, in alignment with the transformative goal of the policy. The assumption is that if Colorado can develop a good instrument, trusted by teachers and leaders, and get people to take the survey, schools can use the resultant data to drive change, i.e., less teacher attrition and student achievement gaps.

THEORETICAL FRAMEWORK

Upon an investigation of policy evaluation instruments, the theory of Theodoulou and Kofinis (2004) was chosen as the necessary framework. The model aligned with the purpose of evaluating the administration process to which Colorado has used. Theoretical frameworks are applied in qualitative inquiry to serve as the foundation of established knowledge, to offer logical explanations for the relationships observed, and to reveal nuanced understandings of a phenomenon (Anfara & Mertz, 2014).

The purpose of a policy analysis is to determine to what extent an implemented program or service is doing what it is supposed to. The process can determine whether the effects are intended or unintended and whether the results are positive or negative for the target population and society as a whole. Theodoulou and Kofinis (2004) have identified the four most used policy evaluation types as 1) process, 2) outcome, 3) impact, and 4) cost-benefit (analysis). The TLCC analysis concerned a process evaluation, or how well a policy or program is being administered. It is often used by program managers to determine what can be done to improve the implementation and/or delivery of the service or program.

POLICY PROCESS EVALUATION

- Determine why a program or policy is performing at current levels.

- Identify any problems.
- Develop solutions to the problems.
- Improve program performance by recommending how solutions should be implemented and evaluated once carried out.

Special attention is paid to the common impediments to effective policy implementation including clarity of goals; quality of information intelligence, or constant feedback on how well the implementation is progressing; and finally, how well the intelligence is being used to engage key stakeholders in the continual improvement process (Theodoulou & Kofinis, 2004).

METHOD

RESEARCH DESIGN

An intrinsic case study design (Stake, 1995) was grounded in the policy evaluation framework of Theodoulou & Kofinis, 2004 and the teaching and learning conditions survey evaluative studies of Child Trends (2020) and FutureEd (2020) to explore the historically low (<60%) educator participation rate associated with the TLCC and the state's overall alignment with its policy goal. The intrinsic approach was ideal as it seeks to capture the richness and complexity of the case (Stake, 1995). This study focused on the stories and experiences of K-12 leaders for which the TLCC was intended. A pragmatic lens was applied in order to focus on the solutions and practical implications that resulted from this policy evaluation (Patton, 2015). Therefore, attending to context was foundational to the research design, data collection, data analysis, and interpretations. Based on the TLCC's continually low participation rate (<60%) and the policy goal of reducing educator turnover, how do leaders representing K-12 communities across Colorado perceive the survey, its administration, and what underlies their attitude?

PARTICIPANTS

Each of the state's 8 education regions were represented by at least one interviewee including the Metro Area, North Central, Northeast, Northwest, Pikes Peak, Southeast, Southwest, and West Central. Two representatives were included from each of the two metropolitan regions, Pikes Peak and Denver, and a representative of one of the larger charter school communities in the state was also interviewed. Of the 11 different populations represented, six were considered by the state as urban, three as rural, and one as small rural, which had an enrollment of fewer than 250 students. The largest community had an enrollment exceeding 50,000 students. Regarding poverty, one of the communities had a free and reduced lunch rate above 75%, five between 50-75%, and two below 25%. Based on the 2022 TLCC statewide participation rate of 52%, three communities were selected to represent participation rates above 70%, three between 50% and 70%, and five below 50%. The 11 leaders included five women and six men, and all were White except one. Three had five or fewer years of experience in the role of superintendent or "non-head" while the others were very experienced in their roles including two who had retired and come back on an interim basis. Three were also adjunct instructors in principal preparation programs and all but two were career educators. Four had a PhD in educational leadership; one was highly trained in project leadership and understanding performance problems, and at least one had significant military experience. Of the three non-heads who represented the largest communities in the study, two were considered relative culture specialists including one in employee and customer engagement and the other in continuous improvement. All participants were recruited by email and/or phone including two who were acquaintances of the researcher.

DATA COLLECTION

Per Institutional Review Board approval, all participants were provided with a consent form detailing the purpose of the study, interview procedures, and safeguards to protect confidentiality. One set of 11 interviews averaging 50 minutes in length was administered one-on-one through web conferencing and digitally recorded. An interview protocol was designed and grounded by similar survey evaluative studies of Child Trends (2020) and FutureEd (2020), and the employee Net Promoter Score (eNPS) (Reichheld, 2003) of enthusiastic loyalty, to explore the historically low educator participation rate associated with the state 'implementation of TLCC and the Colorado's overall alignment with its policy goal to reduce teacher turnover and related student achievement gaps. Queries focused on each leader's background in working conditions data and culture leadership, their experience with the TLCC, and what is needed for their current culture and that of future leaders to significantly improve. As a pragmatic lens was employed, substantial effort occurred to understand the impact of the TLCC on the target population through the perspective of each leader; thus, building rapport with the participants was important to ensure they felt listened to and valued (Patton, 2015). Upon completion of all interviews, the recordings were transcribed by a third-party service and permanently deleted once reviewed and cleaned.

REFLEXIVITY AND POSITIONALITY

Before data analysis, I engaged individually and collectively with colleagues in the process of reflexivity in which experiences, beliefs, values, and assumptions on the ways state-based school improvement strategies are used in P-12 education to support the performance of faculty, staff, and administrators (Watt, 2007). Reflexivity is essential in qualitative research because it forces the researcher to consider their own bias through analytical reflection and dialogue based on their "situatedness" within the research. The theoretical basis of the pragmatic lens was revisited during the reflexivity process to ensure practical implications were foundational to how the interview transcripts were assessed and meanings interpreted (Patton, 2015). Per the guidance of Lincoln and Guba (1985), the social-historical-political positionality of the researcher was made transparent, as it directly influenced the administration of the study as well as the principal findings and interpretations. I am an educator, leader, and consultant who has served racially and ethnically diverse, poor, middle-class, wealthy, rural, urban, and international communities. I have demonstrated a commitment to transforming educational leadership from lines of research to service undertakings that advocate for policies and practices that reinforce improved rates of student academic resilience, family involvement, community support, and educator enthusiasm. I see great value in a sustainable school improvement strategy as both a matter of equal opportunity and pragmatic human capital ends. Therefore, the data were approached largely from an insider perspective; I needed to remain open to other possibilities for why engagement in the TLCC had been continually low. The application of reflexivity and positionality was ingrained to establish prominence on the participants 'experiences and points of view rather than on my perspective.

DATA COLLECTION

The interview data were analyzed using Stake's (1995) four-step deductive data analysis process of direct interpretation, categorical aggregation, pattern recognition, and naturalistic generalizations. A structured coding protocol was first designed using the policy evaluation framework of Theodoulou and Kofinis (2004) focusing on the common impediments to effective implementation, such as clarity of goals; the quality of information intelligence

(constant feedback on how well the implementation of the service is progressing), and how well the intelligence is being used to engage key stakeholders in the continual improvement process. Through the application of Stake's first step, an independent review of the interview transcripts was conducted to identify the value of the TLCC survey service to each leader. This process enabled me to draw direct interpretations from the data before discussing preliminary themes. In the second step, I accomplished categorial aggregation by synthesizing the overarching concepts drawn from the transcripts in the first step. This stage clearly revealed a very mixed appreciation of the TLCC and the process by which the state was administering it. Following Stake's (1995) third step of pattern recognition, precise content was developed through grouping associated data, developing codes, and refining the identified themes. This process enabled me to determine common contextual experiences that influenced corresponding TLCC values to the different leaders. For instance, none of the leaders in the study referenced the state asking for their help in improving the TLCC or how it is perceived. In the fourth step, naturalistic generalizations occurred by evaluating the themes to ensure they represented the entirety of the data and could be applied broadly (Stake, 1995). At the conclusion of this step, four policy process evaluation (Theodoulou and Kofinis, 2004) themes were identified through a pragmatic lens: (1) TLCC's continually failing (<60%) participation rate reflects a passive administration; (2) the problem is that the TLCC does not appear to be on a continuous improvement path; (3) the solution is for the state to follow the best practice example of North Carolina's Survey Service, and overall, to become a champion of the policy goal behind the TLCC; and more specifically, (4) through a robust TLCC advisory committee, establish a sustainable, mission-driven collaborative with educational leadership programs, available model communities, and "specialists" in the field that is focused on key performance indicators (KPIs).

TRUSTWORTHINESS

Multiple authentication strategies ensured the findings were trustworthy by attending to issues of credibility, transferability, dependability, and confirmability (Lincoln & Guba, 1985). To address credibility, cross-case synthesis was utilized throughout the data analysis process to examine whether the themes were cases of similar or different perspectives of the participants, and the conceptualization procedures employed were made explicit (Hayes, 1997*).* To reach transferability, thick, rich descriptions were utilized with participant quotes so readers could decide applicability to their circumstances (Lincoln & Guba, 1985). Bracketing through reflexivity and stating my orientation as the researcher bolstered the trustworthiness of the findings.

LIMITATIONS

Only individuals with access to the TLCC survey were invited to report their views and experiences (Lincoln & Guba, 1985). While I indicated no penalty for choosing not to participate, participants may have felt compelled or uncomfortable declining to engage. The study purposefully attended to expose researcher bias through reflexivity and positionality, although I cannot entirely absolve myself from its potential in the findings and interpretations. I am a career educator, leader, and consultant in K-12 education. I believe strongly in the benefits of teaching and learning conditions data and their important role in sustainable school improvement; therefore, the data were approached largely from an insider perspective. I needed to remain open to other possibilities for why engagement in the TLCC had been continually low. This stance was important to maintain throughout the data collection and analysis processes.

FINDINGS

Ten of the leaders were well acquainted with the TLCC survey. Yet, none referenced having been asked before about their opinion of it or how it was being administered. Thus, they found the solicitation of their feedback on the state's service and their system's alignment with the goal of the policy to be unique. Another distinctive aspect was the voices of those in the rural communities. The Student-Centered Accountability Program (SCAP) appears to be fulfilling a significant need in their schools for a comprehensive evaluation of quality and effectiveness, peer support, and a focus on continuous improvement. Finally, deductive data analysis strategies established by Stake (1995) resulted in four themes following the process evaluation of the TLCC service and the overall alignment of the state to the policy goal: (a) TLCC's continually low (<60%) participation rate reflects a passive administration; (b) the problem is that the TLCC does not appear to be on a continuous improvement path; (c) the solution is for the state to follow the best practice example of North Carolina's Survey Service, and overall, to become a champion of the policy goal behind the TLCC; and more specifically, (d) through a robust TLCC advisory committee establishing a mission-driven collaborative between the state, educational leadership programs, model communities, and "specialists" in the field**.**

THE ADMINISTRATION OF THE TLCC HAS BEEN PASSIVE

As to why the service has been performing as it has, here are the explanations from the sample of 11 leaders for their communities' different levels of survey participation. The three representatives with rates above 70% included a superintendent who had been just hired and was not yet familiar with the state's survey. The next was the superintendent and principal of a small rural district of fewer than 250 students which had completed a modified version of the TLCC as part of their Student-Centered Accountability Project (SCAP) through the University of Colorado Denver. The third representative in the above 70% participation group was the non-head of an urban district and one of three involved in the study who was also an adjunct instructor in principal leadership. They spoke about the related leadership of their teachers' association. "[The association] provides some kind of incentive. They really encourage people to take it. They like to see the results, just like we do." This sentiment was exceptional among the 11 leaders and based on the entirety of their comments, appeared to speak more to the culture (values) of their community than to the impact of the state's approach to administering the survey. The system leader also spoke of personally using the data along with other sources for triangulation purposes to better understand different issues when needed.

Triangulation was also referenced by two of the three leaders in the next group with participation rates between 50% and 70%. The first, an urban superintendent and adjunct instructor, felt the TLCC could be convenient for leaders but was not currently being used to transform systems and related turnover rates:

> *As a superintendent, if you're looking for something to give you a better sense of things moving forward, you can find it. But from my knowledge of its use [by leaders in the state], the data is not yet being used to inform a decision at a critical or statistical level, for example, to understand the importance of relationships and how they impact [retention rates and achievement gaps].*

The next representative in the 50-70% rate group, another urban superintendent, and adjunct leadership instructor said, "I think it's a fair snapshot of how people are seeing their teaching and learning conditions and how they feel organizations are either responsive or not."

They had an internal survey, met regularly with their teachers' association, and when able, used the TLCC as another data point. The third in the group served a rural district and one of the better-off communities represented in the study. They were one of the most consistently positive respondents, though their district's rate of participation did not reflect the same level of enthusiasm. "[The TLCC is] a helpful tool for me to get feedback from staff. I find the comparison to other schools in the district as well as other districts in the state very helpful. It has been the most comprehensive tool we've used." No leader in this group with participation rates between 50% and 70% referenced the use of incentives or the active leadership of their teachers' association concerning their communities' levels of TLCC engagement.

The final five members of the study represented participation rates below 50% and included three leaders from high-need (50-75% free/reduced lunch) communities. First, a non-head from a large system spoke about how their lack of participation reflected their organization's choice to focus on their own internal instrument. "My general impression is that [the TLCC] is probably a great survey. It just hasn't ever felt like something we need to do because we're already doing a lot." The next four representatives all expressed significant frustration with the measure, particularly with its administration including a leader of a rural and the highest need (75-100% free/reduced lunch) community represented in the study. As another member of the collaborative SCAP program, they summed up their impression of the TLCC as just "another gotcha [from the state]. I don't trust it all." The next leader was from an urban community that had an internal survey and said the following:

> *You're the first person who's ever asked me about [the TLCC], yet it keeps coming out … The purpose is unclear in my mind. Is the purpose [i.e., the publicly accessible results] to shame schools or is it really to help students achieve and improve conditions for staff? If the latter is the case, then how do we share it in a supportive versus competitive way?... It feels like [the state] is just checking a box. Yes, we got feedback. Teachers are not happy…whatever the outcome…It is the way we have always done it.*

The next participant, from a suburban community who also had their own internal survey, spoke of how the TLCC was distributed through the teachers 'association and how this has led from their experience to some not receiving access. "I think [distributing the survey through the association instead of the principal] is contributing to some of the distrust [in the TLCC]. I think it's a missed opportunity for communities to really gain invaluable information." They also expressed significant concern about the possibility of where the board could tie their complete evaluation as superintendent to the results instead of to multiple measures as in the case of their teachers and principals. The final representative from the below 50% participation group was a non-head and overall, one of the most focused voices in the group on how to increase participation in the survey and related educator retention rates.

> *I think [the TLCC] is a well-intentioned, poorly executed survey. It represents the sort of disconnect that exists between the State Department of Education and the LEAs. They're asking for the LEAs to administer the survey, and the people don't trust what [the state is] going to do with the data. They don't see any real results related to the data. Also, if you reach the minimum 50% participation rate, the results are publicly available and while [the TLCC] may not be intended to be used*

> *punitively, it feels a little punitive if many of your teachers answer that they hate working right now.*

Of the representative sample of 11 communities, only two leaders consistently spoke positively about the Teaching and Learning Conditions Colorado (TLCC) survey, and no one referenced significant efforts from the state to improve their attitude. The collective perspective appeared to match the participation rate of 52%. As to why the state's biennial service was not better valued, the analysis of the feedback revealed a survey that was being passively administered. In the words of one leader, "It feels like they see it as this is the way we have always done it, and the [statewide] participation rate has always been the same."

THE TLCC DOES NOT APPEAR TO BE ON A CONTINUOUS IMPROVEMENT PATH

Based on the early interview questions specific to understanding each leader's background and organization around working conditions data and associated leadership, the opportunity to significantly increase the value of the TLCC service appears to be well within the state's reach assuming the desire to share ownership of the instrument with its end-users, the leaders. First are that of the non-heads of two of the largest communities represented in the study and of whom both had culture-specific roles. "My work is really just helping schools figure out how to meaningfully incorporate the data into their processes," and "I'm the person who has been responsible for doing the district-level analysis of our employee data." Next, are that of two urban superintendents and one urban non-head. "I would say we've spent more time talking about working conditions as a district over the last couple of years, than ever." "[The focus on the well-being of our people] is about a third of our strategic plan. We spend a lot of time making sure we're taking care of and making sense for our folks," said another. "In addition to surveys, sometimes I use focus groups. I won't be in the room if I want them to not feel they are being pressured to answer in a certain way," said the third and one of the adjunct leadership instructors in the study. Next, are comments from three rural superintendents. "I think [the results from the last survey] were truthful and honest, and I think that's how [the staff] responded," said one. The next spoke of how through the SCAP process, "culture is our number one priority." Finally, one of the newest to the role of superintendent spoke about how they use the TLCC with principals like they previously used student perception data as a principal with teachers.

> *If I had folks that were hard to coach, didn't believe me, or you know I wasn't making a connection with, the data really opened necessary conversations and opportunities for them to improve. I use the TLCC the same way with principals.*

While the above comments of the 11 leaders aligned with the original purpose of the policy behind the TLCC, to reduce educator turnover, the reason for the state's survey service was unclear to many and/or distrusted. For example, assuming the state's vision was for it to be increasingly used by P-12 leaders in their efforts to reduce educator turnover, zero participants referenced the state asking for their feedback on how well they thought the TLCC was being implemented. As with any measurement service, for the instrument to become an invaluable source of intelligence, the voice of the customer needs to be used to fuel its rise in value. Instead, many of the system leaders questioned the overall approach of the state and its alignment with the greater goal of the policy. In the words of one with a third of their strategic plan focused on educator retention, "I think anytime you get something done to you there's a little bit of resistance, versus if you can

have a part at the table, and if the approach continues, resistance can build up." An adjunct instructor and past superintendent of the year also said the following:

> *I don't think the TLCC is on a continuous improvement path, which is why I really appreciate your asking what would give it value. I think asking what is the end-user is a good place to start because if it's going to be a value, let's get the voice of the customer in here.*

In policy terms, the problem with the TLCC involves the common impediments to successful policy administration: insufficient clarity of goals, information intelligence, and strategic planning (Theodoulou and Kofinis, 2004). Any solution moving forward assumes the TLCC is on a path to continuous improvement.

Follow North Carolina's Practice, and Become a Champion of the TLCC Policy Goal

One suggestion to significantly and, more importantly, continually improve the value of the TLCC is to explore the contrasting participation rate associated with North Carolina's survey service. Their state's Teacher Working Conditions Survey and system of administration are currently producing a participation rate of 93%. The value of their service to schools and districts follows a long-term focus on continuous improvement. The system has been facilitated for years through a robust advisory committee whose job has been to ensure each biennial survey is increasingly worthy of their educators' twenty minutes and valuable to their leaders (and leadership trainers) as a retention tool. Their 26-member committee includes teachers and principals of the year, a school counselor, superintendents, a charter schools' representative, two representatives of each professional association, interagency partners, advisors from the state Superintendent's and Governor's offices, and is facilitated by the two members of the state's education department most responsible for its example [of shared leadership to districts]. The survey has become so valuable that communities increasingly use it internally on the off year the state is not administering it. The committee's focus today is primarily on the improved use of social media to increase the positive energy around the instrument and the improved fundraising of prizes to better celebrate its resulting participation rates. Like Colorado, North Carolina is a local control state, its results are shared publicly online, they have the same allocated budget for their survey, it is run through a third-party vendor, and the measure is opened in the spring with the results being shared approximately six weeks later in early June. In contrast to Colorado, education support staff are not included, they are not an open enrollment state, do not allow unions, only require a minimum 40% participation rate for the data to be accessible compared to Colorado's 50%, their survey access codes are distributed by each school's working conditions representative, approved by the principal (e.g., the improvement team's chair or the secretary), and their measure has been statistically evaluated. It is a reliable instrument for use in predicting educator retention (NCTWCS, 2022; A. Montanari, personal conversation, June 30, 2022). On a final note regarding the use of "suggestion" (versus "solution") at the beginning of this section, while the quality of North Carolina's implementation practice and instrument appear related to their phenomenal response rate, there was no exploration of how exactly their survey data was being used (or not) at the local level nor whether there is consistent evidence that a high level of engagement has led to improvements in teacher retention and student success.

The next opportunity for Colorado succeeds an analysis of final feedback from the participants on the current state of their cultures concerning the transformative goal of the original policy, to reduce turnover and related student achievement gaps. Current teaching and learning conditions, predominantly speaking, are associated with the nation's system of administrative accountability and control. To change this way of doing things and associated outcomes is a disruptive goal. It requires a system of continuous improvement that every leader must be familiar with. For example, focusing on clarifying the mission and directing the community toward strategic goals and results, i.e., transformational leadership; or sustainably speaking, the innovative implementation of a professional form of work organization where accountability comes from within, i.e., the better K-12 systems in the world (NCEE, 2016; NCSL, 2016; Schleicher, 2018a; Schleicher, 2018b). Unfortunately, the policy goal runs in direct conflict with how the TLCC has been administered and how most administrators in the country were raised to manage their schools. When the leaders were asked where their community was on the continuum between administrative accountability and control, and a "vibrant professional learning community," most saw their systems as "in the middle" or "balanced," and depending on the size, varying based on the needs (F/R lunch) of each school. Overall, though, their descriptions reflected systems that reinforced the role of the school as the source of knowledge, and of the student as the passive recipient of school services. There were two exceptions. The first was from the rural leader of a more affluent community who described their system as "high in autonomy but moving towards standards-based grading." The other was the interim leader of an urban district who said their community was "much more about management and compliance than leadership and creativity." They went on to say the following:

> *We select principals and teachers because of their creativity, but as soon as we hire them, we expect compliance. And I think that's a sad thing to say because we have some creative people in a lot of different ways, and we're not tapping into that resource. I think that's where we get bogged down, you know, what do we take off the plate for people to have space to think?*

Next, when the leaders were asked how they think (excluding salary) their employees would rate their schools or district as a place to work on a 10-point scale, most said a "6" or "7." The ratings averaged in the "detractor" range, meaning overall, they collectively viewed their cultures as significantly at risk of losing people (Reichheld, 2003). Finally, when asked what they see as the difference between their current culture and that of a very positive ("9-10") environment, they referenced the following. "Three people leaving," and "people being accountable through relationships to each other, including students and parents," said two rural leaders. "Professional accountability and more appreciation;" "retaining principals, and more planning time for teachers;" "work-life balance, and more counselors, social workers;" "a focus on a positive culture and working through problems openly;" and "a strong plan of action," said leaders of five urban communities. "It's not possible, there are too many restrictions in place" and "more time is needed for teachers and principals to address the number of competing requirements systematized to meet the needs of the imaginary average child," said two relative culture specialists from the largest communities represented in the study. The transformational leader in the group based on their history and interview spoke of the importance in their new district of "getting people to believe in the greater purpose of becoming a great place to work." They went on to say:

> *I've got to do that with my administrative and principal teams. I've got to make them believe you're working towards the best thing we can be. And then it just spreads; that's what it's going to take … You don't send your team out there saying you're going to get beat. I've seen principals do that.*

Overall, the majority of the "how to improve conditions" responses were consistent with that of a professional form of work organization or transformational leadership.

At the end of each interview, leaders were asked what preparation programs can do to train future leaders on how to create very positive cultures and the dominant voice concerned the importance of being service and relationship oriented. Many referenced the importance of feedback. "Leaders need to learn how to ask for and receive feedback," said one of the culture specialists. "Leaders need to receive an analysis of '"me,'" and "they need to know themselves, their strengths and weaknesses," said two of the leadership instructors in the group. The rural leader of the highest-need community in the study was more specific. "Leaders need to be accountable to teachers, parents, and students; absent the personal investment, the [reciprocal] accountability will not be there." One of the newest to the role of superintendent spoke of the importance of observing "the process of creating a safe environment around listening to feedback in the whole group, and how to follow up accordingly." The other relative culture specialist in the group talked about understanding human or adult development. "To develop the authority and related performance of your staff, you have to think about them as needing differentiation in the same way your students need it." Finally, two leaders' responses stood out from the group; both were from women. The first was from a newer superintendent. They used to see a third of their teachers leave every year but this year even despite COVID, they had their highest retention rate ever.

> *We no longer see people as replaceable. We see them [internally] as the customer … It took time to change the culture to where we are all here to be supportive of each other, to be service-oriented … Every person is valued equally. It doesn't matter if you're the bus driver, the physics teacher, or the principal. Everyone.*

She also spoke of how important the hiring process is to the culture. "When I hire, I don't care about your content mastery. I care if you get people, and you love our kids. We can teach you how to teach math." The next response came from the most experienced leader in the group and one of the adjunct instructors. First, she talked about her general approach as a leader after many years, which recently attracted recognition from her district's teachers 'association. "If you can be open and talk about, we're all about continuous improvement; we all have places we want to do better, and [through walking the talk] you create this climate and culture of continuous improvement, it's well received."

As to what leadership instructors like herself can do to better support future leaders, she said the following:

> *[Preparation programs] need more of a focus on how to create a climate and culture for learning and a good working environment where people are anxious to come to school and anxious to recruit others to come to our district.*

The responses to what is needed in future leaders concerned the importance of being accountable and using feedback to be increasingly aware and of service. The comments of the last two leaders stood out as they spoke about the process and importance of creating a culture around

shared values and/or collective growth. In closing, the eleven leaders know their current cultures are not in alignment with the goal of the policy, to increasingly reduce turnover and related achievement gaps but their insight into what is needed aligns with the research. In summary, "a strong plan of action" is needed to make the transformative goal of the 2008 state policy within reach.

THROUGH A ROBUST TLCC ADVISORY COMMITTEE ESTABLISH A MISSION-DRIVEN COLLABORATIVE

Below follows the final element of the policy framework that guided this analysis, to recommend how solutions should be implemented and evaluated once carried out. To begin, the TLCC's alignment to its policy goal has yet to be statistically evaluated, or at least the results have not been shared with the public. If the obstacle is a lack of adequate participation, a robust advisory committee like North Carolina's survey service should be able to help. But this assumes it is continuously facilitated in an evidence-based manner, focused on clarifying the purpose of the TLCC and directing members toward strategic goals and results, i.e., transformational leadership. As to the clarity necessary to attract the committee's focus and corresponding levels of survey participation after years of low engagement and related distrust, the shared leadership team may need to include the active presence of the Governor and the Education Commissioner like North Carolina's launch decades ago, to make clear the greater vision of the survey data and the related charge of the committee. For instance, it is to be increasingly used by schools and districts to achieve long-term continuous improvement and, as referenced by the leaders, by principal leadership programs to show their students how to methodically create very positive, growth-oriented cultures. The organization of the committee and the way it is facilitated should allow trust and related participation in the TLCC to increase significantly.

Next, structural support may be necessary to ensure that the momentum of the mission-driven group is sustainable over the long term. For instance, for (a) those already in the field who have not been taught how to methodically create a culture of continuous improvement including leaders with understandable [survey] resentment of more performance data being available to the public or (b) leadership instructors who have only ever known administrative accountability and control, the Governor and Commissioner may need to spearhead the effort to recruit sponsors, foundations, business groups, etc. and "specialists," i.e. proven growth culture leaders, to allow adequate support to be increasingly available to interested leaders. As to the alignment of future leaders to the goal of the policy, incentives along with personal encouragement from the Governor, Commissioner, and education-focused business groups may be needed to motivate preparatory programs to acquire their own cultures of continuous improvement. This incentive may be worthwhile when compared to the strategy of using guest speakers from or field trips to model school and/or district communities to prepare graduates to serve their future communities accordingly. Instructors can use the direct experience of their work organization to show their prospects how culture can be created and momentum, sustained.

For the purpose of evaluation, these growth-oriented preparatory programs can also have end-user-centered relationships with their model communities and specialists in the field. This high level of interdependence is essential to enable the hand-off of the new leader from the program to the specialist (where applicable) to support their increased independence. "Levels," meaning key performance indicators (KPIs), for example, their school's rates of educator enthusiasm, family involvement, and student progress. Finally, based on feedback from those involved in the study, the specialists in the field and the representative voices on the TLCC advisory committee

need to be respected members of the different community types across the state including small rural, rural, and urban districts, and charter schools. In the case of the specialists, they must be willing to become a member of the community through regular on-site visits. Said a veteran, rural leader, "I can't remember the last time someone from the state was out here. But the regional liaison has been an awesome resource. We love [them]. [They] don't act like big brother."

In closing, in addition to increasingly efficient educational leadership programs and the growing availability of partner specialists in the field for new leaders, the value of those at the top starting with the Commissioner of Education (and/or the Governor) having the presence of mind to openly model the collective growth process cannot be overstated, e.g., making transparent their blind spots and derailers and what they are doing to continue to improve. The culture, whether it be growth or compliance-oriented, follows the values of the leader and/or the organization's core beliefs. For example, if the department can post or even include at board meetings, KPI reports including internal levels of employee enthusiasm and external levels of satisfaction with their services, one can naturally expect districts to slowly follow their values and make the shift from compliance to service.

DISCUSSION

The purpose of this research study was to understand the chronically low level of participation associated with the TLCC and the greater alignment of the state to the transformational goal of the policy, to reduce teacher turnover and related student achievement gaps, from the perspective of its intended end-users. The advisory committee-led process of increasingly aligning the system of the state with the goal of the policy coincides with the literature on high-performing K-12 systems associated with a leadership style focused on clarifying the mission and directing members toward strategic goals and results, i.e., transformational leadership (NCEE, 2016; NCSL, 2016; Schleicher, 2018a; Schleicher, 2018b). In addition, including leaders as active members of a robust TLCC advisory committee consistent with North Carolina's best practice, and supporting leaders to create cultures of continuous improvement corresponds with significant "TELL" research that indicates that students perform better in communities where educators are included in improvement planning and in the process of creating the culture of the school (Ingersoll, 2018). Next, growth-oriented cultures relate to the importance of schools developing a moral center through a focus on authentic learning communities, where people share the same core professional values (Flaxman, et al., 2019; Kegan, et al., 2016; Santoro & Berliner, 2018; Schleicher, 2018b). Finally, findings from similar survey evaluative studies from Child Trends and FutureEd align with the general mission of the "collaborative," to ensure that schools are able to use the TLCC data for decision-making by providing data-focused consultation or technical assistance, along with training on data interpretation and data-informed decision making; building buy-in for data use by ensuring that data are high-quality and reflect the needs of the school community; supporting leaders to engage multiple stakeholders in the review of data; and emphasizing the utility of school climate data for improvement, rather than for accountability (Jordan & Hamilton, 2020; Soloman, et al., 2020).

Finally, the comparative lack of progress by the TLCC does not appear at first glance to be due to a lack of capacity by the state. The department of education through the State of Colorado has its own internal survey and uses it bi-annually along with "pulses" in between for systematic employee retention processes. The state's coordinator of related efforts said the Department is sharing what they are hearing with their people, celebrating the positives, and where needed,

putting action plans into place. They are also utilizing "stay interviews" to uncover flight risk situations where an individual is becoming disengaged and at risk of leaving.

In closing, the policy evaluation framework of Theodoulou and Kofinis (2004) was a useful tool for determining what can be done to improve the implementation of the TLCC including aspects of delivery. The common impediments to effective policy implementation were consistent with the case of the TLCC.

Practical Implications

This policy evaluation illuminates critical implications for other states with "TELL" policies, as it brings to light the greater importance beyond the survey, of departments of education acting as effective models of the continual improvement process. As an example, while the TLCC service and its transformative policy goal were the focus of this study, the need for a service and growth-oriented approach may apply to other policy goals the department is responsible for leading. To be more specific, not all school communities are aware of the importance of being service-oriented and tracking "early indicators" of performance such as the potential case of the state collecting cyclic satisfaction data on the TLCC service in the future. Absent such a positive early indicator of related service effectiveness, the department cannot reasonably expect a later increase in the TLCC participation rate, and ultimately, absent a significant participation rate (and a reliable instrument), one cannot expect a corresponding impact on teaching and learning conditions. In summary, absent from being service-oriented and proficiently using early indicators of performance, the greater system will remain stuck, associated with flat overall academic growth and record disinterest in the profession.

Future Research

As a follow-up to this study focused on system leaders as the end-user, it would be interesting to hear from rank-and-file teachers about how they think they are affected by the use (or lack of use) of the TLCC survey. Future exploration is also warranted on state departments of education that have implemented internal systems of continuous improvement and its corresponding impact on internal rates of employee enthusiasm, satisfaction with their programs and services, and the proliferation of similar internal systems across their school communities and colleges of education. Additional research is needed on the impact of implementing specific professional learning communities for state coordinators of specific services such as that of the TELL-type survey, now in existence across over 20 states. Finally, exploration is needed on educational leadership programs that are methodically teaching and/or modeling how to create and sustain cultures of continuous improvement.

Conclusion

Through a pragmatic lens (Patton, 2015), this intrinsic case study (Stake, 1995) provides a rich understanding of the participation rate associated with the TLCC from the perspective of leaders of school communities for whom the service was intended. The TLCC service, assuming a robust advisory committee, can become a powerful champion of improved teaching and learning conditions statewide when organized around the transformational goal of its policy to reduce teacher turnover and related achievement gaps. Finally, a service and growth-oriented approach is needed at the core of public education in the United States. Missions defined through strong core beliefs used in combination with early indicators of performance, for example, levels of educator enthusiasm, family involvement, student academic resilience, and related leadership can together

be transformative to long-term rates of educator retention and student achievement. The discipline is common among the best K-12 systems in the world.

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