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***New England College Journal of Applied Educational Research* (*NECJAER*)**

98 Bridge Street Henniker, New Hampshire 03242

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The *New England College Journal of Applied Educational Research* (*NECJAER*) is an open access journal that aims to give authors a platform to publish their ideas, work, and research for the benefit of educators and their students, PreK–Institutions of Higher Education. The purpose of this journal is to help educators advance the cause of making education equitable for all students.

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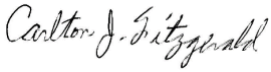
Message From the Editor

In a recent interview, David Brooks stated, “we have created two different Americas,” people with a high school diploma and those with a university/college diploma. According to Brooks, that difference has caused a “cultural divide” in which people have become angry about how they have seen the system of elitism in our nation and around the world develop. To begin to deal with part of this issue, universities with large endowments are now offering tuition-free entrance for any student whose parents make less than $200,000 per year and who is prepared for their institutions. Of course, with acceptance rates of 5% or less, many people see their offers as being shallow. Maybe even worse is the fact that our public schools are as or more segregated than during MLK’s fight for equality. So, the question appears to me to be, “So, what are educators going to do to make education equitable?” We hear so many people state that our educational system is outdated and inequitable but the system appears to continue down the

same tracks we have ridden for the 75 years of my life. John Hattie, in an interviewed, stated that he believes that, in spite of impediments to education, most teachers are doing great work to get the majority of their students to learn in their classes. Maybe, it is time for educators to lead the way to more equity in our schools and in our societies. Perhaps, if we remember how important teachers, instructors, professors, deans, etc. are for the success of our students, we will recruit, invest in, and grow educators whom we honor and support so they will create systems of education centered on helping all of our students reach their potentials.

Hopefully, the projects and research accomplished by educators will continue to encourage teachers and students around the world.

Thank you for all that you do for your students and their families.



Carlton J. Fitzgerald, EdD

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Teaching All Students: The Use of Self-Paced, Mastery-Based, Blended Learning to Reach All Learners

Sheri Mistretta, CAGS

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Abstract

Our methods to reach all students are no longer effective for the student body before us. Many students are struggling with stress, inattention in class, and absences from school. A significant number of our students are struggling to get to and stay in school. In addition to these issues, students are struggling to find relevance in their education. Students used to depend on their teachers to impart information to them that they would need to function in college, their careers, and society. Now, with all the answers conveniently located in their pockets, students need teachers to teach them how to ask the right questions. I have come to believe our classrooms need to be flexible and welcoming places where students can work at their own pace, whether due to difficulties with learning, paying attention, or getting to school. In this action research project, I implemented a self-paced, mastery-based, blended-learning process with my students and attempted to give each student work designed for their specific academic needs while also trying to build relationships with students in small groups and one-on-one interactions. Data showed: (a) time out of class was reduced from 12% to 7%, (b) students completed more schoolwork and achieved higher grades, (c) students indicated work was at their appropriate level, and (d) 90% of students reported enjoying class more.

Keywords: blended learning, mastery-based learning, self-paced learning, inclusionary teaching, positive learning environment

The current popular methods of attempting to reach struggling students include differentiating the curriculum, using visuals and multiple means of presentation and assessment,

using technology, scaffolding instruction, building a positive learning environment, and making learning meaningful to the real world and students' futures (Kampden, 2023). In exploring the most recent methods of teaching all students, including our most underserved and most vulnerable populations, models of blended learning, mastery learning, and self-paced learning all look like promising interventions. According to Kampden (2023), students today need a reason to engage in an activity; they need to see value in what they are learning or doing. Many of our students are facing adult challenges at heretofore unseen levels, including home and food insecurity, working during school hours to support their families, and the mental health challenges and gaps in learning that go with these issues (Stockman, 2023).

The makeup of the generation of students we are teaching is continually evolving and changing. If teachers want to reach all students, we must also evolve and change with our students. Students and teachers now live in an age where answers to common questions can be easily found on a device in their pocket. Students do not depend on teachers to impart knowledge in the way they used to. The need to memorize information to have it at your fingertips is also no longer necessary. With the advent of artificial intelligence, tools are commonplace and accessible to all, and the need to ask the right questions is more important than the need to come up with answers. Students in 2025 need to be taught how to think and problem solve more than they need to be taught random facts. I believe teachers need a system to engage all of the students that come from varying backgrounds, ability levels, educational levels, and family structures, and who have varying abilities to engage in the curriculum.

Literature Review

According to Kampden (2023), to help all students be successful in schools, including our most underserved and most vulnerable populations, educators should explore models of blended learning, mastery learning, and self-paced learning. The purpose of this literature review is to look at how schools and teachers can produce and implement a high rigor curriculum, as measured by student grades, work completion, attendance, and student

satisfaction data, for all students, including the most vulnerable students (e.g., ELL students, students who have mental health struggles, learning disabilities, physical disabilities, or ADHD issues, students who have attendance issues). At the same time, schools must maintain the financial investment and staff time investment at a realistic level for our budgets and teachers.

The overall themes I explore in this literature review include: (a) models of blended learning; (b) efficacy and outcomes of blended learning; (c) important elements of an effective blended-learning model; (d) implementation of blended learning; (e) barriers to success for blended-learning models

Models of Blended Learning

There are several models and names that are used synonymously for blended learning like “flipped classroom,” “hybrid learning,” and “remote learning.” These models differ from blended learning, which is the thoughtful integration of technology into face-to-face learning (Vine et al., 2016). The image many administrators get, when they think of blended learning, is rows of students staring at a laptop. But blended learning is not meant to be the same as remote learning or online learning (Vine et al., 2016). Staker and Horn (2012) identified four major models of blended learning:

1. The first blended learning model is the flipped-classroom, and any type of station rotation set-up within a classroom, where students move at a set pace through any number of physical or electronic stations.
2. The “flex” model is a model of independent learning, where teachers provide tutoring or small group instruction only as needed, not on a preplanned basis.
3. In the self-blend model, students decide which elements to take in the classroom in person and which to complete independently on-line.
4. In an enriched virtual model, students move at their own pace through virtual learning; this can be compared to a flipped classroom model without the set pace.

Efficacy and Outcomes of Blended Learning

Research has shown varying levels of success between modest and exponential gains in the area of knowledge acquisition and content mastery for blended learning (Dehghanzadeh et al., 2019; Yan et al., 2022). Much of this variation can be accounted for based on the elements included in the specific blended learning plan. For instance, gamifying learning was found to be successful in a large-scale study (Dehghanzadeh et al., 2019). Immediate feedback and immediate intervention when problems arose were also found to be key elements for successful learning (Yan et al., 2022).

The largest growth area across all the literature, regardless of methodology, was in the area of autonomy and student attitudes to learning (Gault & Cuevas, 2022). Across all the studies considered, a high percentage of students were found to like the blended learning model. Blended learning was also noted to reach some of the more difficult to reach students, such as newcomers to the United States and students with special education needs (Mutya & Masuhay, 2023). According to Mutya and Masuhay (2023) these students were able to achieve mastery of content at a higher level using self-paced learning.

In a study of 182 students, across 12 different classrooms who took part in the blended learning model, were found to have mastered a science curriculum content as measured by summative assessment scores (Mutya & Masuhay, 2023). Of the 182 students, only three scored under 80% in the course, and 107 students scored over 90%. The remainder of the students scored between the level of 80% and 90%. Students not only achieved at higher levels when it came to assessment but also were noted as being more engaged in the curriculum (Mutya & Masuhay, 2023).

Other studies did not find the same jump in grades and mastery of content, but when Gault and Cuevas (2022) surveyed their 88 student participants, they reported increased confidence in the subject matter. Over 80% of the students reported feeling more organized, and 87% of students reported feeling more engaged. Grades for these students were slightly

higher than the grades of a control group that participated in a traditional classroom model. The other important thing to remember is that there is evidence that when attitudes and confidence rise, grades rise in the long-term (Bazelais et al., 2022). To be noted, data in this study were taken from a single 8-week period, not a full academic year of learning. This is a serious limitation considering the teachers and students were new to the methodology and technology at the beginning of the 8 weeks (Gault & Cuevas, 2022).

In a small study of eight students over the course of 10 weeks that focused on vocabulary acquisition, every student in the study had a higher test score on a poststudy test, and all students were out of the failing range, though the gain for most students was modest (Katasila & Poonpon, 2022). A pre and posttest was used to measure both the achievement gains of the students and student attitudes toward both the curriculum and their confidence in mastering the curriculum. Content related pretest scores ranged from 53 to 77, while posttest scores ranged from 60 to 87. Additionally, every student reported increased confidence and feeling more proficient using the vocabulary they had now mastered. All students also reported that they enjoyed the blended learning model more than the traditional classroom model of lecturing (Katasila & Poonpon, 2022).

Ataizi and Aksak Kömür (2021) detailed a study of 11th graders who were learning English writing through a blended learning model. This study found a hugely positive outcome in students acquiring writing skills through this method (Ataizi & Aksak Kömür, 2021). Ninety-two percent of the students participating in this study had not used the blended learning method before; the fact that they made such gains in content with so little background in the methodology was very encouraging. Overall, students most liked the flexibility, their ability to control when they moved to new content, and they found the writing activities to be more enjoyable using this method. Both student attitudes toward the content and their actual

knowledge acquisition were found to be very positively affected in this study (Ataizi & Aksak Kömür, 2021).

Student responses about blended learning, in a study by Vine et al. (2016), was largely positive, especially in how they perceived knowledge acquisition. Seventy-seven percent of students felt as though they learned more through this method (Vine et al., 2016). However, when it came to feeling satisfied with the course, this fell to about 47% positive and another 37% neutral, with the remaining 14% disliking the format. Some students in general appeared to be neutral about this intervention, but their grades, knowledge, and confidence all increased during the study (Vine et al., 2016).

Elements of an Effective Blended Learning Model

Şengel, E. & Aktaş (2022) focused on inquiry-based learning and felt that the three most important elements of a blended learning model are social presence, teaching presence, and cognitive presence. In other words, students felt connected to teachers, peers, and the content. Affirming these results, a two-part study looked at two different models of blended learning in the mastering of a STEM curriculum (Bazelais et al., 2022). The results of this study were interesting as they may account for why many other studies have had such mixed results about blended learning. In the first part of the study a new instructional framework was implemented along with the implementation of blended learning. Test scores went up under this condition in comparison with a control group. In part two, blended learning was implemented without a specific instructional framework, and the test scores were the same as the control group (Bazelais et al., 2022). The results really pointed out that the model of blended learning makes a tremendous difference in outcomes for students. It should be noted that in both blended learning groups, students reported enjoying the courses more and feeling more confident about their abilities with the curriculum. The instructional framework specifically implemented two-stage quizzes into the curriculum, students were given short 10–12-minute quizzes followed by 10 minutes of peer feedback and discussion. Students' performances under this study condition

had significantly higher test scores than the second blended group and both control groups (Bazelais et al., 2022). It would seem that the quizzes, peer feedback, and discussion may have helped students feel connected to not just the content, but also their teachers and peers. Simply employing any system of blended learning does not necessarily lead to success, other elements must also be present (Gault & Cuevas, 2022).

In a dissertation examining the implementation of the Modern Classroom model of blended learning, both test scores and student reports of their feelings about learning were examined in a group of 9th grade students in ELA classes (Dunn, 2023). The Modern Classroom Methodology, as delineated by the Modern Classroom Project (Wolf et al., 2020), is a blended learning and mastery learning model, where students do not move to new material until the current content has been mastered, as measured by an independent project or exit ticket. Teacher lectures were eliminated in this model and replaced with short videos. Surveys were administered at the beginning and mid-point of the school year. Self-expressed student responses indicated generally feeling less anxiety and greater positive classroom behavioral outcomes after implementing the Modern Classroom model. They also noted feeling as though technology was being used to students' advantage, students had time to complete their classwork, and teachers had an easier time with lesson planning. Teachers also felt greater growth professionally over the course of the first semester. Students reported greater resiliency and higher frustration tolerance with difficult content, felt more engaged, and felt appropriately challenged. When students were asked if they wanted to take more courses taught with the Modern Classroom methodology, 84% stated that they preferred this model, 10% stating they would like a more hybrid approach, and 6% wanted to go back to a traditional classroom model (Dunn, 2023).

The Modern Classroom Project commissioned Johns Hopkins University (Wolf et al., 2020) to look at the same group of 281 9th grade ELA students and compared the results of honors and college prep students across several domains. In the case of content mastery as

measured by a summative exam, a significant difference between the Modern Classroom group and the control group was not noted. Of course, it is difficult to make significant gains if the students already have high scores. However, student engagement was found to be greater in both honors and CP students in the Modern Classroom model of learning. Students also reported more autonomy with new content. Additionally, Modern Classroom students had significantly more positive feelings about their teachers and their relationships with their teachers (Wolf et al., 2020).

Jung et al. (2022) summarized research on many models of schema-based instructional design, summarizing data from over 600 sources and drawing many conclusions about effective instructional designs for learning. The authors posited that current self-paced and online learning curricula focus on quality content but are ignoring how humans learn and how to engage the learner. When there is not a live instructor, the learner must be able to make meaningful connections to what they already know and must be able to grasp the new information without too high of a cognitive load (Jung et al., 2022). Using schema-based designs to automate, activate, and create hierarchies of current knowledge makes the new information graspable and more engaging to the learner. The study concluded that schema-based design is critical for self-paced learning. By guiding students in schema activation, the students are then able to draw conclusions and add new information to their current knowledge, as opposed to simply memorizing new information for the short term, and then forgetting this fragmented knowledge quickly after a test. This study suggested direct prior knowledge analysis before teaching new content (Jung et al., 2022).

Poleschuk et al. (2023) studied children of families that have either immigrated to Italy or are seeking asylum in Italy and must now learn the Italian language. This study analyzed some successful elements of self-paced learning for children trying to acquire Italian using self-paced learning. The first element was gamifying learning. For the in-class portion of the blended learning model, peers were often paired heterogeneously, where one peer could support

another peer's learning. One of the successes in this study was to use the remote learning to reinforce in class learning. Instead of starting with video learning, the video portion of the learning was in the middle of the blended learning model. This study found that students gained vocabulary faster, were more confident using the new vocabulary, and were overall more satisfied with learning in this manner. This model was most effective with the students that are most critical to reach including newcomers to the country and students with disabilities. Students were able to start learning right away at their own level, instead of wasting academic time in classes where they did not yet understand the language (Poleschuk et al., 2023).

Bautista (2015) looked at the academic results of 68 students in chemistry that used a self-paced learning model that emphasized teachers as facilitators while students directed their own learning. Students made their own plan of information acquisition and adjusted the plan as they went along with the help of the teacher/facilitator as needed. The students' acquisition of information and motivation to learn were both studied through pre and posttests and through questionnaires. The blended learning design in this study included videos as complementary and supplementary materials, peer-tutoring, teacher lectures, laboratory activities, and frequent check-ins and feedback from the teacher. This study also took into consideration the fact that children naturally learn socially and emphasized the acquisition of knowledge through others that knew more, such as peers, mentors, and teachers. Using these methods and blended learning, student motivation and confidence grew exponentially. Of note in this study however, the impact on lower ability students was not as great as that on higher ability students (Bautista, 2015).

In a study of a large group of 9th graders across eight schools in Thailand that compared blended learning to a control group, the blended learning group showed tremendous growth compared to the control group, and also showed secondary gains such as having more fun with the content when in school and greater autonomy in learning (Dehghanzadeh et al., 2019). The blended learning program included gamified elements such as leader boards, prizes, ranking,

tasks (missions), and points. The gamification was used to increase engagement and motivation in learning the new content, and it was shown to be highly effective. Elements of learning were rebranded to be more appealing. In this study, tests were called “fighting monsters,” writing papers was called “crafting,” and presentation skills were now “quests.” Gamifying elements of learning could be a very important element to add to a blended learning pedagogy (Dehghanzadeh et al., 2019).

Implementation Considerations

The importance of professional development and precourse training for teachers was noted across the literature. In a study by Şengel, E. and Aktaş (2022), inefficiency of a poorly applied model was warned against, noting that professional development must be specific (Şengel, E. & Aktaş, 2022). This study detailed elements that did, and did not, effect learner motivation. For instance, workload was not found to have any effect on learner motivation. Positive effects were found from teachers that had more experience with technology and teachers that had more positive beliefs about the efficacy of the method. This study confirmed once again that although students had a more positive experience with the blended learning course and felt more confident, their actual gain as far as knowledge or grades was either neutral or only slightly positively affected. The authors noted about academic gains in this study that exams were online and multiple choice only, which could have had a deleterious effect on the outcomes for some learners. This study did confirm the need to help teachers have a positive attitude about implementing blended learning (Şengel, E. & Aktaş, 2022).

Moore et al. (2017) outlined a four-course professional development opportunity that taught teachers how to use technology effectively in the classroom, while also using their in-person instruction more effectively in light of the introduction of the new model. The study emphasized the need for professional development to be active learning and not passive, and the authors carefully laid out the scope and sequence of their course for others to replicate. Teachers in this study also continued their opportunities for support through PLCs for the

remainder of the school year. The model aimed to not only teach the technology and new in-person teaching methods, but also change teacher attitudes toward blended learning. Course One introduced the tools, and then the next three courses were tailored to the teachers completing work for their classes in real time (Moore et al., 2017).

In another study with a different professional development model, four 9th grade teachers designed the online component of their classes after an 8-week professional development course in blended learning (Wayer et al., 2015). All four teachers taught in different areas and included a physical education class. The study showed that although all four teachers took the exact same professional development course, they enacted blended learning in extremely different ways and with very different results. This outcome emphasized that the professional development must be carefully targeted to a particular model for teachers to understand and implement the model and elements of that model correctly. The study concluded that if blended learning is done correctly, it clearly can increase student engagement and enhance learning (Wayer et al., 2015).

Possible Barriers to Success to Consider

Professional development focusing not just on the mechanics of blended learning, but on the model and elements of an effective blended learning environment and teacher attitudes toward blended learning, must be implemented for the intervention to be effective (Poleschuk et al., 2023). Other studies found that without specific professional development, teachers used differing methods of blended learning and were met with widely varying results (Mutya & Musuhay, 2023). However, other barriers also exist when it comes to implementing a large-scale blended learning program.

Yan et al. (2022), clearly laid out a number of barriers to learning using self-paced learning models and solutions to those barriers. One of the first barriers to self-paced education is the requirement of high self-regulation and high intrinsic motivation. This is key information in deciding how much of the learning should be remote. The other two barriers mentioned were a

lack of immediate feedback and a lack of proactive intervention. Immediate feedback, proactive intervention for struggling learners, and methods of helping students stay motivated, must be built into the design. Using schema design is one way to help with motivation while removing the cognitive load (Jung et al., 2022). Focus on mastery learning also will assist with the number of learners who will struggle by giving all students time to assimilate the content of one lesson before moving on to the next (Yan et al., 2022).

Barriers arise at every level of a school when implementing a new pedagogy including administrators, teachers, and support staff. In a study by Vine et al. (2016), some of the challenges that were encountered by teachers included: (a) Feeling there were time constraints, and teachers could not make the online modules that they wanted, they felt student grades suffered, and they felt their courses might become generic (Vine et al., 2016). (b) Teachers also perceived that some students felt their workload was increased. On the other hand, teachers also noted benefits: (a) Teachers felt they could spend more time with their students, individually and in small groups. (b) Teachers also noted that students came to the lessons with a level of knowledge from the video and this allowed their work to be deeper and more meaningful (Vine et al., 2016).

Conclusions

Engaging learners in today's world requires different tools and methods than education has previously employed. A significant number of students today are facing disruptions in their education, mental health challenges, housing and food insecurity, and high rates of absenteeism (Stockman, 2023). A standard paced curriculum is not designed to meet the needs of these learners, learners that may or may not be emotionally or physically present and ready to learn on a daily basis. Mastery-based blended learning with carefully included curriculum elements and meticulous staff professional development is a worthwhile method to explore to solve the intrinsic problems of reaching today's students.

Methodology

For a 4-week period from April 8 to May 8, 2024, I taught a high school math class using the Modern Classroom methodology, which is a self-paced, mastery-based, blended-learning model. Just before starting this action research project, I became certified in the Modern Classroom method. I wrote and implemented all of the content and collected data from:

1. Each student's final grade at the end of the 4-week study, or mastery data.
2. Attendance data, including missed classes and time out of class for bathroom or water passes.
3. Student engagement, as measured by the quantity of work completed and missing work.
4. Weekly Exit Ticket Questions (given on Fridays):
    a. Did you enjoy class this week?
    b. Was the work too easy, just right, too hard?
    c. Would you want to take more classes taught this way?

Intervention data were compared with two other discreet 4-week periods, one selected from each second and third quarter. Students' intervention data was compared with their own data from previous quarters to look for changes during the intervention phase.

Setting and Participants

This study was comprised of 10 students in their high school math class at an urban high school in Massachusetts. There were seven male and three female students in this class, all between the ages of 16 and 17. The regular classroom teacher, who is dual-certified in math and special education, was present during the duration of the study to support students as needed.

Data Collection Tools and Processes

Grades and work completion were logged in the school's normal grading software. Grades and attendance data were logged daily as applicable. Attendance was tracked both by

regular class attendance data, and by the electronic hall pass system the school customarily uses, which logs students' passes including the amount of time they were out of class. These metrics from the intervention period were compared with two other discreet time periods for the same students. Additionally, students completed a weekly exit ticket to collect data about the pacing and content of the class and student's feelings about the class.

Results

Results are presented below in tables broken out by individual student, as well as aggregate data presented for the group as a whole. Individual results and aggregate results have been analyzed to determine the efficacy of the intervention. Survey results are also broken out by both individual students and group metrics (see Tables 1–4).

Out of Class Data

The first metric I looked at was the time out of class. The "class cuts" columns represent the number of times the student was in school, but did not attend class. The "out of class" columns represent the percentage of time the student was out of class (including cuts) and could be for reasons such as getting water or using the restroom (see Table 1). As can be seen from data in Table 1, the number of class cuts fell from an average of 1.5 to an average of 0.4, and the time out of class fell from 12.4% to 7.1%.

Table 1

Out of Class Data

Student	Q2 cuts	Q3 cuts	Q4 cuts	Q2 out of class	Q3 out of class	Q4 out of class
1	0	0	0	0	0	0
2	5	6	2	8%	7%	7%
3	9	7	2	40%	38%	28%
4	0	0	0	48%	42%	22%

Student	Q2 cuts	Q3 cuts	Q4 cuts	Q2 out of class	Q3 out of class	Q4 out of class
5	0	0	0	5%	4%	4%
6	0	0	0	0	0	0
7	1	1	0	14%	16%	7%
8	0	0	0	9%	8%	3%
9	0	0	0	0	0	0
10	0	0	0	0	0	0
Aggregate	1.5	1.4	0.4	12.4%	11.5%	7.1%

Work Completion Rates

Work completion data are the percentage of work the student completed in reference to the amount of work assigned to the student (see Table 2). The amount of work completed increased slightly from the control data, from an average of 83.45 in Quarters 2 and 3 to 85.5 during the intervention period of the study.

Table 2

Completed Work

Student	Q2 % work completed	Q3 % work completed	Q4% work completed
1	98	96	95
2	100	92	95
3	71	66	80
4	68	80	78
5	92	96	95
6	68	65	75
7	65	65	75
8	82	77	75
9	98	96	95
10	98	96	95
Aggregate	84.0	82.9	85.5

Percentage of Mastery

The mastery data is based on the students' grade for the work they completed. This percentage only accounts for the grade the student received on completed work and does not include any "0" grades given for work not attempted (see Table 3). Mastery, or student grades, also climbed slightly, but moved out of the C range and into the B range. The overall average grade rose from 77.65 to 80.5 during the study. Four students had lower averages during the study (students 2, 5, 8, and 9), and six students had higher averages during the study (students 1, 3, 4, 6, 7, and 10).

Table 3

Mastery

Student	Q2 % Mastery	Q3 % Mastery	Q4 % Mastery
1	88	90	90
2	92	91	90
3	64	58	75
4	58	76	75
5	84	90	80
6	63	61	70
7	53	61	70
8	80	72	70
9	91	95	90
10	92	94	95
Aggregate	76.5	78.8	80.5

Student Survey Data

Survey data were collected at the end of each week of the project and was presented as an anonymous exit ticket. To be sure all students completed the survey, students showed the researcher their screen that said "survey submitted" before leaving class (see Table 4). By the end of the intervention period, 90% of students enjoyed the class and wanted to continue on with this system of teaching and learning, and 70% of students felt like the work was the right

level for them. Data indicated that in the first week, four of 10 students enjoyed the class, and during weeks three and four, nine of the 10 students enjoyed the class. Data also indicated that each week more students felt the work was just right for them (2, 5, 6, & 7). Nine of the 10 students indicated in weeks three and four that they would like to continue to work in this fashion.

Table 4

Student Ratings

Question	Week One		Week Two		Week Three		Week Four	
	Yes	No	Yes	No	Yes	No	Yes	No
Did you enjoy the way the class was run this week?	4	6	7	3	9	1	9	1
Would you want to continue to learn this way?	7	3	8	2	9	1	9	1

Question	Week One			Week Two			Week Three			Week Four		
	Too easy	Just right	Too hard	Too easy	Just right	Too hard	Too easy	Just right	Too hard	Too easy	Just right	Too hard
How was the work?	0	2	8	1	5	4	0	6	4	1	7	2

Discussion

Our urban district is currently facing a student attendance and content mastery crisis. Many different attempts have been made to reengage students, including offering incentives for attendance, hiring a team of reengagement specialists specifically for the purpose of going to student homes and trying to reengage them, and even employing punitive actions, such as the

loss of the privilege of attending the prom or other activities if absences were too high. None of these interventions have solved the problem. Research data indicate that the system used in this study may be one way to reengage students through making their learning more accessible, self-paced, and mastery-based. I have come to believe, if students can return from an absence knowing they can get right back on track in all their classes without penalty or embarrassment, they are far more likely to reengage. Once they are reengaged, if school is generally more enjoyable, and less daunting or frightening, students are more likely to then remain engaged.

The results of this study showed that the amount of time out of class was greatly reduced. In just 4 weeks it fell from 12% to 7%, and the students that missed the most class before employing mastery-based learning, increased their class attendance by nearly 50%. Not only did students attend class more regularly, but they completed more work and received higher grades, although by a small margin. One could extrapolate that with more time with this method, likely the statistics would improve further since when students are in class more often, they are going to complete more work and therefore master more work. By the fourth week of the study, 90% of the students in class felt the work was at the right level for them, as opposed to just 20% at the beginning of the study. Students also reported enjoying class more, with 90% reporting that they would enjoy taking more classes employing this method.

Limitations

Some of the findings could possibly be skewed for a couple of reasons. First of all, I am a new teacher to these students. To get more precise results would have required their regular teacher carrying out the new teaching method. Being an entirely different teacher, some of my results could be affected by my relationship status with this group of students. Secondly, my method of classroom management is different than that of other teachers. All teachers have their own style of management, and this might affect the results of any teaching system in a positive or negative way, depending on the students. A third factor is that this system employed project-based learning as opposed to the worksheets and paper and pencil assessments the

students were previously using. Therefore, the actual work used to compare the mastery and work completion data were not precisely comparable. Finally, the study was conducted over a short time period of 4 weeks with a small sample size of 10 students that were all the same age. More time and a larger sample size would be required to get valid data across our entire school population.

Conclusions and Recommendations

Even considering the limitations for this study, the system definitely proved itself to either maintain or improve students' ability to complete and master work. The statistics for how much students enjoyed the class, felt confident in their ability to successfully complete the work, and their attendance data, improved dramatically. Therefore, this system of teaching would be well worth a much larger trial in classes of different content areas with students of differing ages, academic abilities, and behavioral abilities. This system appears to be a promising intervention to the attendance crisis our school is currently facing.

This study showcased that self-paced, mastery-based learning has great potential to help solve the attendance crisis in our district. Further research across content with students of varying ages and abilities is warranted to prove the efficacy of the system and make an educated decision about a full district roll-out of this type of teaching and learning. There would be significant cost in the form of not only money, but in the investment of time from every level of the district to make mastery-based learning a reality. The next logical step I would recommend would be to offer professional development options to any interested staff to learn how to employ this method in their classroom and then give these staff members simple tools to take data about the successes and failures they and their students experienced. These staff members could then go on to be the leaders in a system-wide change should these data prove that this would be advantageous for our district.

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Trauma, Attachment, Educators, and Ted Lasso: The Importance of Relationships and Connection

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Abstract

The TV show *Ted Lasso* provided a unique and insightful lens into the importance of developing trust and relationships between teachers and students. This article underscores the importance of developing relationships and attachment in classrooms, particularly with students of trauma and various mental health challenges. I explore specific moments within the show that drew connections between Ted Lasso's personality, coaching style, and attachment style to those that exist within the classroom. Teachers can adopt these strategies to foster safe, supportive, and trauma-informed environments for their students while developing positive connections and trust. This article provides a look into how Ted Lasso builds connections through the employment of core counseling techniques such as empathy, patience, tone, cadence, and consistency to build connections. This article demonstrates that educators can utilize similar techniques to build trust with students who may struggle due to trauma or mental health issues. I examine the importance of developing trust and positive relationships with students that are crucial for social and emotional regulation and academic success. Schools must provide teachers with knowledge, tools, and training to better address the growing and complex emotional needs of students. By integrating core counseling concepts into practice, teachers will be better positioned to meet student needs. This article suggests that, like Ted Lasso, a blend of kindness, insight, and emotional intelligence, can provide teachers with skills to transform their classrooms to foster trust, understanding, and a trauma-informed approach to teaching and building relationships.

Keywords: relationships, student-teacher connections, attachment, trauma, trust, ACEs

Educators are tasked with a complex, rewarding, and difficult job. Their job is to provide an education to all students and help prepare their students for success in the present and preparation for future success. By sharing knowledge and skills that students can take with them in one way, shape, or form, educators are meeting those tasks each and every day. Whether educators are working in private or public educational settings, in elementary, secondary, or higher education, the difficulty, complexity, and responsibility are equally as great. As noted, the role that educators play, on a basic level, is to provide students with learning opportunities with the intent of helping them transfer that knowledge to future tasks. There are many qualities, that I am sure could be debated, that an educator must have in order to stand with students and provide the knowledge they need. However, the question has to be asked, not of what the educator can provide to students, but what has to be present in the student for an educator to be successful in their ability to reach and engage with a student and have the student learn?

Garner (2007) discussed cognitions that are needed in order for a student to learn. Garner illustrated that cognitive structures need to be present such as “comparative thinking structures, symbolic representation structures, and logical reasoning structures” (p. 2). Garner talked about cognitive structures being used to organize information and to analyze patterns to identify relationships and asked the very question posed at the beginning of this article, what is needed for a student to learn? The goal of this article is to advocate for another concept to be added to the skill sets described by Garner and be in the forefront in the minds of educators. That is to provide educators with the strategies and knowledge about what students need to learn and to further make the case for four other components equally important to learning and classroom engagement: trust, attachment, relationships, and connection. Naturally, a key to success for teachers and their students is the ability of educators to implement effective classroom strategies for building the four components.

Before I get to the inspiration for this article, I feel that it is important to start with an observation. It appears that the power of positive attachment and the development of relationships and trust with students is often underestimated. Each educator, I believe, understands that these concepts are important, but some do not necessarily understand the degree to which these are critical to not only child development, but also to that of academic growth. Attachment, relationships, trust, and connections help students grow and learn. Specifically, through the lens of child development, relationships and attachment are critical to the life cycle and development of a child in that attachments developed in infancy, assist in determining attachment styles and relationships through the individual's entire life cycle (Beebe & Lachmann, 2014). To illustrate this point and to get into the inspiration for this article, I will take a step back several months prior to my sitting in front of the computer to put these ideas together.

Inspiration for My Article

It was not long ago that I found myself needing to decompress and practice some "self-care" after a really long week. As the definition of a difficult week is subjective and may differ from person-to-person or situation-to-situation, for myself as a mental health clinician in a private practice and a school mental health counselor for a public school, this particular week was one of those weeks filled with client and student difficulties, 504 and IEP meetings, and continued work on a doctoral dissertation. In my quest to "unplug" from the world for a bit, I did what so many people do in this situation. Rather than going outside for a walk or taking in the beauty of mother nature, I found myself engaging in that age old activity of watching television. With the type of week that I had experienced, my goal was to find a movie or a show to watch that would allow me to completely detach from the world around me, for at least a short time. Lying in bed, I continued to hit the buttons on the remote searching for something to watch. As I navigated through the usual streaming services and live television, I stumbled onto Apple TV,

the streaming service owned by Apple Incorporated. I had gone back and forth until I happened to stumble upon the show, *Ted Lasso*.

I want to preface what the rest of this article will relay with an acknowledgment. I understand that with movies and shows there is a lot of work that goes into the script, increasing the understanding that there are significant differences between real life and imagination. As with any show, I envisioned several screenwriters sitting around a table, looking at story boards, talking back and forth with each other with a primary focus on gaining as much of an audience as they can get to increase profit, advertising, and the hope for future seasons and possible awards. They pre-determine the premise of the show, the character development, the characteristics and personality of the main characters, and everything the character will say (with the exception of extemporaneous and ad-libbed phrases). Ted Lasso stars actor Jason Sudeikis and follows his titular character, Ted Lasso, who is an American football coach from the mid-west of the United States who is offered and accepts a position to lead and coach a struggling British football (soccer) team in England. Expecting a simple comedy, much like Sudeikis' other comedic works, like the movies *Horrible Bosses*, *We're the Millers,* and *Hall Pass*, I resigned myself to the fact that this would be a show that I could plainly and simply "binge-watch" with a little laugh in between and would allow me that disconnection from the stress of the week that I was seeking.

How mistaken I was since, after two episodes, I was quickly thrown out of the realm of entertainment and locked into critical thought, drawing connections between the show and the experiences of educators and students in schools. As each episode progressed, by the end of the weekend, I had successfully watched all three seasons and drew connection after connection to the work that is being done in schools, and what we can do better as educators. The show became a testament to the power of connection, belonging, leadership, and attachment with many of the concepts being relatable to students, learning, and education. To better understand the connection between Ted Lasso and education, I feel it is incredibly

important, first, to describe my impression and perception of Ted as a character to include his relationship style and how he interacts with the other characters in the show.

Ted is surrounded by an entire cast of characters some with overwhelming eccentricities while others appear to be less eccentric and more normalized. Ted is able to consistently be himself and holds onto his values, and at some points, shows the difficulties in coming to terms with his past and his experiences. Simply put, one of the most important qualities about Ted is that he is human. In being human, I do not mean this in terms of Ted being of a particular species, but human in his capacity to feel. Ted understands that he does not know everything, especially as it relates to British football. Despite this lack of knowledge, he looks past the differences between American football and British football and returns to the basics of being human and understanding the needs, possibilities, and potential of others. In understanding this, he sees the potential and capabilities to succeed in the people around him and looks at ways that the individual can positively impact the group and, vice-versa, the group on the individual. This is evidenced by Ted's relationship with the team's equipment manager whom he affectionately calls, "Nate the great." Although there have been articles written about *Ted Lasso* and the combination of both comedy and drama, one of the most significant takeaways from the show is Teds' ability to radically accept the moment, work through adverse events with resiliency, accept people for who they are, meet people where they are at emotionally, and show immense loyalty to his team and co-workers. Although amazing in his capacity to show an unwavering ability to rise to the occasion for the people around him, Ted also struggles with his own mental wellness and his own relationships.

Ted experienced the death of his father due to suicide at a young age as well as other experiences in his life that ultimately helped shape who he has become. These experiences have affected his relationships with others and, at times, his capacity to be present and mindful in the moment, as when he begins to suffer from panic attacks. Two things that Ted does well is his constant reflection regarding his bias and worldview and to seek out ways to channel biases

for his personal evolution and to further assist others. In subsequent seasons, Ted's sense of humor is found to psychologically be a defense mechanism to combat uncomfortable feelings and situations that he does not wish to acknowledge or confront. With all of Ted's qualities, there is one trait that Ted possesses that provided me with the most insight. This is Ted's ability to connect with others in various situations, especially his relationships with the more complicated characters in the show. Ted has remained consistent and patient in his approach, even when discounted by others in his attempts to connect. Ted's vast potential to feel empathy and to assist others in being the best versions of themselves through the power of connection and attachment became the mainstay of the show for me.

Oftentimes and like Ted, through worldviews, bias, a lack of knowledge and confidence, educators may feel unable to reach some of those more difficult students due to student mental illness or trauma. To meet the needs of these students, educators, like Ted, can work with individuals on their potential through developing positive connections and mental wellness. They can do this by not only understanding trauma, but by also developing some core counseling principles and effective strategies to develop rapport, connection, and attachment with some of the most difficult students while also recognizing their own relationship with trauma and adverse circumstances (Bhatnagar & Many, 2022, p. 520). This is where the intersection of trauma and education meets and outlines the critical role that educators play in minimizing the effects and sometimes the reversal of the ill effects of student experienced trauma and adverse experiences. Paramount to foundational understanding of educators meeting the social, emotional, and mental health needs of students, is understanding trauma and adverse childhood experiences (ACEs) on student attachment and relationship development and the implications they have on student learning and engagement.

Trauma

When a child experiences trauma, the autonomic nervous system becomes compromised. McCorry (2007) described the division of the autonomic nervous system in two

parts, the sympathetic nervous system which activates the fight, flight, freeze, and fawn response, and the parasympathetic nervous system that acts to calm after danger or when the adverse experience expires. In children, when there has been prolonged exposure to trauma or adverse experiences, the child remains in a constant state of fight, flight, freeze, or fawn and is not able to calm themselves bringing about a lack of learning, engagement, relationships, and potential future medical issues such as substance abuse, obesity, depression, and suicidality (Ross et al., 2020). To put this into plain terms, the sympathetic nervous system handles the stress response for the brain through activation of the limbic system consisting of the Amygdala and Hippocampus and the parasympathetic nervous system consisting of the Vagus Nerve serving to calm the nervous system when taxed. When children experience enhanced and prolonged periods of trauma and adverse experiences, especially during the periods of early childhood development without proper mitigation, the trauma and experiences become a part of the child's DNA and can become embedded into a child's biology (Garner & Yogman, 2021). There have been several studies that examined trauma in children and the effects that trauma plays on the developing mind, but few are more common and spoken about than the adverse childhood experiences (ACE) study (Centers for Disease Control and Prevention, 2023) and the Adolescent and Behavior Survey (ABES) study (Centers for Disease Control and Prevention, 2023).

In the 1990's, Kaiser Permanente and the Centers for Disease Control and Prevention (CDC) studied the effects of trauma on children. Known as the CDC-Kaiser Permanente adverse childhood experiences (ACE) study (Centers for Disease Control and Prevention, 2023), the researchers studied roughly 17,300 respondents who were adults at the time of the study, and asked about their childhood experiences. The ACE study examined respondents' childhood experiences with abuse, neglect, poverty, parental death, parental divorce, parental incarceration, familial mental health issues, and substance use. What this study concluded was that the more negative or adverse experiences a person had or the higher the ACEs score, the

higher the likelihood that the child would display both psychological and physiological issues later in life, to include significantly lower ages of mortality. In students, according to Sacks and Murphey (2018), the prevalence of students with 3 or more ACEs was very high estimated at 1 in 10 for most states with some states showing much higher at 1 in 7. As a result of ACEs, students with 3 or more ACEs are 3 times more likely to experience academic failure, 5 times more likely to exhibit attendance issues, and 6 times more likely to exhibit behavior problems (Sacks & Murphey, 2018).

In 2021, the CDC received federal funding through the Corona Virus Aid Relief and Economic Security (CARES) Act providing emergency money to companies, citizens, industries, and corporations. With this money, the CDC sought to study the effects of COVID-19 on high school students. As a result of the study, the Centers for Disease Control and Prevention (2023) found that 1 in 3 high school students suffered from mental health issues in the wake of COVID-19. Although the Adolescent Behaviors and Experiences Survey (ABES) study was generated to examine the effects of COVID-19 on students, the study indicated the trauma caused by the entire set of experiences of that time was having very negative effects on the mental health of millions of young Americans. Another study completed by the CDC, the Youth Risk Behavior Survey (YRBS), produced a larger and more systemic issue than did the ABES study. Arguably, both studies indicated a significant issue with child, adolescent, and teen mental health. The CDC (2023) reported that data from the YRBS indicated 18% of high school students reported having a plan to die by suicide. The ABES study (CDC, 2023) data indicated that when students felt connected, they exhibited better mental health and that there was a positive correlation between connection and relationships to that of mental health.

In Ted Lasso, there is a time where Ted begins to experience panic attacks. The more stress that Ted was put under to win games and certain triggering events, the more pronounced the panic attacks became. This eventually led to his seeking help through the team doctor, Sharon. During these sessions, Ted escapes and avoids the pain and acceptance of his past

trauma through the use of humor. In sessions, Ted also begins to exhibit anger towards Dr. Sharon, as he is displacing and projecting his anger towards the doctor and not looking inward at himself. Through empathy, gentle challenging, and allowing Ted the space to feel safe in expressing his feelings, there was finally an emotional breakthrough.

Like students who have experienced adverse events and trauma, educators need to be in a position to provide empathy and a safe space for students to not only be physically safe, but to feel emotionally safe. As traumatic events compound within a child, felt-safety, described by Purvis et al. (2013), as the state in which a child feels capable of expressing and advocating for their needs, decreases and leaves the child unable to respond to sometimes even the most menial tasks. In order to feel safe and emotionally regulate, it is important to understand what happens to the body with experienced trauma and stress, which like Ted's panic attacks, the stress may manifest in emotional and behavioral challenges inside of the classroom. When a traumatic experience occurs, the limbic system becomes activated and sends a signal to the hypothalamic-pituitary-adrenal axis (HPA-axis). The brain tells the adrenal glands, a part of the endocrine system that there is a problem, and the adrenal glands produce cortisol. Cortisol acts, in generic terms, as the alarm system for the body and the brain. Cortisol plays a large role in how our bodies regulate different things and through the hypothalamus and pituitary glands, which are both located in the brain, not only assists with emotional regulation but also assists the human body in keeping inflammation down when and if needed, increases blood sugar, controls the sleep/wake cycle for individuals, and controls blood pressure (Bernard et al., 2015). When the stressor is over or the stressful or traumatic event has ended, cortisol levels in a child will decrease and return the body and emotional state back to its normal operating baseline.

In a child who experiences compounding traumatic events, that child's hypothalamus-pituitary-adrenal (HPA) axis responds to this stress along with the limbic system to produce the required cortisol in response to the stress of the event, but does not return to their baseline levels (Bernard et al., 2015). Simply put, if the brain is in a state of constant stress which

individuals who have experienced trauma and ACEs are, the alarm that is activated under the stress response, remains on and fully activated. This can lead to many different health problems such as obesity, difficulty sleeping, heart disease, but also creates psychological problems such as anxiety, depression, relational issues, and attachment issues within children that can affect their learning and overall academics (Bernard et al., 2015).

Attachment, Connection, and Childhood Development

In *Ted Lasso*, Ted has a strong connection and a strong attachment to his assistant coach, Coach Beard. Ted further connects to the other members of his coaching staff in a little group that he and Coach Beard affectionately called the Diamond Dogs. In this group, the members of the Diamond Dogs are able to express a problem or issue and receive feedback from the other members as to a possible solution. Ted's connection to his staff and willingness to provide the nurturing environment to the members of the team allow them to learn, grow, and maximize their potential for success.

With this in mind, we have to ask what it means to connect with someone. Many of us may describe connection through traditional definitions, while others may use the psychological term of having a "sense of connection" to someone. Martino et al. (2017) defined connection as a "feeling a part of something larger than yourself, feeling close to another person or group, feeling welcomed and understood" (p. 468). Many may simply define connection as a friendship, someone whom one can commiserate with, or a person with whom many interests are shared.

However, connection and attachment go deeper. In his experiments in the 1950's, Harlow (1958) studied the effects of attachment on monkeys. Harlow constructed two metallic monkeys, 1 constructed with fur that provided only warmth and comfort, and another wire monkey with no fur but food. What Harlow concluded was that the baby monkey would stay and remain with the furry monkey for comfort and nurture, although the monkey would leave the comfort of the metallic monkey covered in fur for the monkey that had food, the baby, once

finished eating, would go back to the furry metallic monkey. This experiment illustrated the importance of a nurturing adult or caregiver in a child's life.

Bowlby (1982) studied the concept of attachment and developed the attachment theory. In his theory, Bowlby defined attachment in children in 4 stages. He described the first stage as the pre-attachment stage in which a baby, aged birth to 3 months, would cry and the caregiver would respond. In his second stage, Bowlby described a child aged 6 weeks to 7 months as the indiscriminate stage in which the preference of a primary caregiver, usually a mother, is developed to meet the child's needs and trust is developed. The third stage, the discriminate stage, Bowlby described as a child, aged 7 to 11 months will have an established preference for one caregiver over another and will react by crying when the caregiver is not around and have increased anxiety around strangers. Bowlby described the fourth stage as the multiple attachment stage in which children 9 months or more begin to seek bonds with caregivers other than the primary parent or caregiver such as siblings, grandparents, and friends of parents. These stages when applied to the stages of lifecycle development provide a comprehensive and robust understanding of what can happen when healthy attachment is not met.

Erikson and Erikson (1998) discussed the different stages that a person goes through within their developmental trajectory. According to the Eriksons, there are 8 stages of development with different conflicts that a person needs to successfully meet and complete in order to progress to the next developmental stage. The stages were defined as 0–1 year, 1–3 years, 3–6 years, 7–11 years, 12–18 years, 19–29 years, 30–64 years, and 65 years plus (Erikson & Erikson, 1998). The conflicts that are associated with these ages are trust vs. mistrust, autonomy vs. shame and doubt, initiative vs. guilt, industry vs. inferiority, identity vs. confusion, intimacy vs. isolation, generativity vs. stagnation, and integrity vs. despair (Erikson, & Erikson, 1998). They theorized, as an example, that a child in the autonomy vs. shame or doubt stage, should they not develop a sense of independence and begin to ask themselves if they can do something by themselves or if they need the assistance of someone else, will not be

able to move onto the next stage of initiative vs. guilt, or asking themselves if they can do this and whether or not that this is going to create a sense of guilt if they are unsuccessful in their task (Erikson & Erikson, 1998). In looking at the stages of development along with the theory of attachment, it is easy to understand how a child who has not been nurtured, shown affection, or had their basic needs met, will not develop trust, and they themselves will not be able to show affection and may struggle to develop a healthy attachment style.

Attachment Styles

Remember when I described Ted as having his own issues that he is trying to work through? Well, Ted demonstrates an attachment style that neglects his own desires and tends to cater to others' needs. One of the things that Ted does when he first meets his boss and the team owner Rebecca, which at first glance appears to be a nice and friendly gesture, is he begins to bring her freshly cooked English biscuits to work every day. However, when put into the context of Ted and his attachment style and relationships, Ted is simply seeking the approval of someone and seeking security and consistency that was not provided to Ted as a child where he had his needs met inconsistently, otherwise known as a preoccupied attachment in adults or an anxious ambivalent style in children. Bowlby (1982) not only discussed the importance of attachment on a child and their development, but also put a description to 4 childhood and 4 adult attachment styles that each individual may possess depending on circumstances.

Bowlby (1982) described the four childhood attachment styles as secure, disorganized, anxious avoidant, and anxious ambivalent attachment styles. In adults, they may present as secure, fearful avoidant, dismissive, and pre-occupied attachment styles. What Bowlby theorized in describing these attachment styles is that secure children produce secure adults, disorganized children produce fearful avoidant adults, anxious avoidant children produce dismissive adults, and anxious ambivalent children make preoccupied attachment styles in adults. In other words, what we experience in childhood affects how we are as adults.

Attachment was not only examined by Bowlby but also Lawrence (2023) who looked at attachment and specifically identified and examined the bond with educators.

In their writing, Lawrence (2023) outlined the importance of educational attachment bonding as a way to influence and improve the relationship between teacher and student. Lawrence (2023) further examined the significant roles that teachers can play in nurturing and supporting students through positive connections and in an environment where the student can feel safe, valued, and have a sense of belonging. The importance of the concept of educational attachment bonding is underscored by educators factoring into 6 out of the 8 stages theorized by Erikson (Erikson & Erikson, 1998). Whether it be pre-school or at an institution of higher learning, educators are in the position to provide the care, concern, and empathy that many students do not have access to, due to maladaptive attachment styles that are formed as a result of trauma and adverse experiences. In order to provide students with the level of care they need, I believe it is incumbent upon us to also understand our own adult attachment styles, how our past experiences affect the way we teach, and, arguably most importantly, the ways in which we are able connect with students, develop trust, and mitigate the effects of ACEs and trauma. There are strategies that educators can take that will assist in developing those relationships.

Effective Educator Strategies

In one episode of *Ted Lasso*, Ted's boss Rebecca is giving a eulogy at the funeral of her father. Rebecca had a complex relationship with her parents and during the eulogy, Rebecca finds it difficult to find words to continue the eulogy and begins to sing "Never Gonna Die You Up" by British singer Rick Astley. Ted, who appears to be the consummate empath and does not let people struggle on their own, sometimes at a detriment to himself, also begins to sing leading to the entire church sanctuary singing along with Rebecca. Ted exhibited the core counseling skill of empathy. Empathy is when we put ourselves into the emotional state of the other person and feel, as much as we can feel, what the other person is feeling. Showing

empathy is arguably one of the first and most basic ways to begin to develop attachment and trust with a student. However, this is not the only counseling competency that translates well into a classroom for educators. As educators, one of the most important counseling theories is that of the person-centered approach.

Carl Rogers (1957) founded the person-centered therapeutic modality which looked at the building blocks of the therapist and client relationship. Rogers described six conditions that need to be met for the therapeutic relationship to be successful. The six conditions include: (a) psychological contact between the therapist and the client, (b) the incongruence of the client, (c) the congruence of the therapist, (d) unconditional positive regard as the complete and supportive acceptance of an individual regardless of what they say, what they do, or their experiences, (e) empathy regarding the clients perception and worldview, and (f) the client's perception of the therapist being congruent and showing the client that they care (Rogers, 1957). Educators can utilize core counseling techniques to assist in developing a positive relationship and trust with students. Many teachers may feel when looking at a person-centered approach, that if meeting a child with a soft tone, a slow cadence, and empathy that this means that there are no consequences being applied. As a person-centered modality, this technique does not mean you cannot challenge or hold a student accountable, it simply means that on a basic level, that someone is showing care and giving attention to another. This includes an educator providing validation of a feeling such as, "I am so sorry that you are working through that and you have every right to be upset," or, "This is a hard assignment and I can understand why you would be anxious when first looking at this assignment." Showing care, validation, and empathy are the hallmarks to building and maintaining relationships between educators and their students.

In contrast, as mentioned briefly, that challenging and holding someone accountable is a part of the effective strategies that educators can use to build trust and relationships with students. Purvis et al. (2013), in their development of the trauma-informed intervention Trust-

Based Relational Interventions (TBRI), suggested that through connection, which utilizes empathy, congruence, touch, eye contact, and levels of engagement as a foundation, trust can be built with children who experience trauma with those counseling competencies having a positive effect on their developmental trajectory and minimizing the long-term effects of trauma of the student. Purvis et al. (2013) described the necessity for caregivers, which includes teachers, to set and maintain boundaries, consistency, and natural consequences for actions that children may take. Many of the strategies that educators can use to develop relationships and attachment with students align with core counseling concepts of eye contact, mirroring a student, tone of voice, cadence of voice, active listening, and playful engagement.

Beebe and Lachmann (2014) discussed the importance of eye-contact and mirroring as they studied the relationship between infants and their mothers. In their study, Beebe and Lachmann put mothers and their infants into a laboratory room and asked them to play with one another without the use of toys. The researchers studied the eye contact and facial expressions between the two as they played then introduced separation between the two. They studied the play, separation, and reunification between them to establish the attachment connection and style. What Beebe and Lachmann found in their study was that through eye-contact, along with playfulness and other forms of communication, the child presented with a more secure attachment style. Beebe and Lachmann surmised that when eye-contact is made between a mother and child, a husband and wife, boyfriend and girlfriend, and teacher and student, it communicates that I am with you, I am joined with you, and I am connected to you (p. 21).

Muhlberger et al. (2011) further examined not just the role of eye-contact, but the impact of facial and non-verbal expressions on individuals. What the authors noted was that when the facial expression or non-verbal presentation was angry, the response of the other individual was also angry. In contrast, when the facial and nonverbal expression was happy, it assisted in providing the same and matching facial and non-verbal expression in the individual. The importance of showing students that their teachers are connected with them through eye-

contact, mirroring, and other non-verbal forms of communication expresses to a student that has experienced trauma or ACEs, that you, the educator, are available for so much more than simply academics. The teacher is showing that they are there to meet emotional and social needs of the students as well. As important as eye-contact is, equally important is that of the tone, volume, and cadence of voice when working with students who have experienced trauma or ACEs.

In *Ted Lasso*, Ted's voice, for the most part and along with his quirkiness is inviting and open. The tone, cadence, and volume between two people can set the stage for the rest of their communication between one another. The power of voice cannot be underestimated and the cadence, tone, and volume can match the situation and can provide both structure and nurture (Finset & Piccolo, 2011). Mogel (2018) examined the role of voice in the development of a child and that with appropriate voice and words, children learn and grow both socially and emotionally. Using the power of lullabies as a starting point, Mogel examined infants in a hospital setting and studied brain development and heart rate between children who were sung to as opposed to those who were not. Mogel found that when the babies were sung to, the brain grew larger and faster and that the infants heart rate and breathing patterns were also regulated and steadied. If the power of voice, tone, and cadence can be so impactful to infants and the physiological effects that soft tones can play on regulation, imagine briefly what impact this can have on a student who has experienced trauma and ACEs.

As an example, an educator is interacting with a student, who moments prior, had an argument with their friend. The student begins to kick their locker, crying, and is yelling at their friend. Although in the moment, the educator may need to raise their voice to get the student's attention, the goal would be that as the student's voice increases in volume, the educator's voice would get softer in volume and slower in cadence. As the student begins to increase the cadence of their speech, the educator would continue with a slow cadence and soft tone of their speech. In this situation, the tone that the educator takes is one of nurture and understanding

and by controlling the tone, volume, and cadence of voice, the teacher is not only de-escalating the student, but is also role-modeling adaptive social behavior.

As discussed previously, core counseling competencies are there to assist a clinical counselor or therapist to develop an alliance with a student that is not unlike the alliance between a teacher and a student. Within this relationship of nurture and safety, the concept of playful engagement assists in maintaining the rapport between the teacher and the student and allows for both to examine the safety and trust of the relationship through fun.

Playful engagement encompasses a wide variety of techniques that can increase laughter, increase connection, and provide a safe and secure environment that can also assist in desensitizing the effects of trauma and ACEs. Purvis et al. (2013) discussed ways that individuals can interact through games, playful tones of voice, joking, and fun in-class activities that can be used to produce trust and build up relationships. Play and playful engagement is a great way to move past some of the obstacles that may be present between even the most resistant children and students. Play assists in building communication and at times allows for the play to take the place of words (Kaduson & Schaefer, 2006, p. 10). To further illustrate this point, Kaduson and Schaefer (2006) discussed the concept of abreaction, which they defined as the reliving of the traumatic event and the emotions surrounding the event. They explained how structured play and playful engagement can assist students and children in being able to work through these feelings and experiences when they have the difficulty in finding the words to talk about them. Students who have had experiences with trauma and ACEs often times have experienced fractures in relationships and attachment and through the application of playful tones, games, and genuine playful interactions, trust and relationships can be re-structured and developed. Obviously, teachers are not therapists, so they should not try to apply therapy. But, when students are having a difficult time, structured play along with other core counseling techniques can help students change their emotions.

Conclusion

In *Ted Lasso*, there is an episode where Rebecca's ex-husband Rupert walks into a bar and eventually, Ted and Rupert engage in a game of darts. It was decided that whomever wins the game will be able to decide the starting line-up for the team. As the game moves along, Ted finds himself in a position where he needs at least a triple twenty to win. In darts, a triple 20 is the dart hitting the inner circle for 20. Ted throws the first dart and hits his first twenty. As he throws his second dart, he begins to tell Rupert that he was always bullied in school and was always underestimated. Ted continues to describe a moment when he had driven his son to school and observed a quote by Walt Whitman that says, "Be curious, not judgmental." Ted proceeds to throw the second dart and gets the 2nd twenty point that he needs. Down to his last dart, Ted continues to tell Rupert that all of the people that used to make fun of him and belittle him, were judgmental and never held a curiosity about someone else. Ted says, "if they were curious, they'd ask questions" (Sudeikis, et al., 2020). As Ted throws the third dart, he hits the bullseye, winning the match, and states to Rupert that had he been more curious rather than judgmental, he would have known that Ted played darts in a league since he was a teenager.

Looking Beyond Behaviors

As educators, there are times when behaviors are observed of a student by a teacher that are often mislabeled (Pas & Bradshaw, 2014). Pas and Bradshaw (2014) argued that many educators lack the knowledge and training to differentiate between behavior and a trauma or crisis response. This at times can be difficult, since many behavior problems are the result of crisis or trauma. As educators, we need to be like Ted Lasso, and we need to learn to be more curious and less judgmental. Asking ourselves what the crux of the behavior may be or even asking students what they may need in the moment, is an important step in the right direction. Utilizing core counseling skills and a person-centered approach to education can assist in understanding what students may need and where their deficits may exist. Asking questions is

the key to student success, but also asking one more important question, “Who can I ask for help?”

Professional Learning Communities (PLCs) Can Help

Many educators participate in professional learning communities (PLCs). These professional development meetings can help educators, because they are based on the elements of adult learning (Merriam, 2004). Knowles (1984) discussed andragogy as a teaching and learning process to work with adult learners who are different from children and adolescents. Knowles (1984) explained that there are four key differences that are important for adult learning. These differences include: (a) Adults want to be treated as mature people. Adults want and need to be more involved in the planning and assessment of processes in the learning. (b) Adults’ experiences are important and should be the basis for learning activities. (c) Adults want to learn concepts and skills that have an immediate impact on their jobs and/or personal lives. (d) Adult learners want more problem-centered, more realistic learning rather than curriculum-oriented learning. PLCs are developed by educators for educators, and when run effectively, employ all of the elements of andragogy in the process.

What teachers learn and how they learn it is sometimes not only ours to take in, but to also share with a common goal and mission in mind. The sharing of that knowledge, especially relating to the student experiences and their ability to work through trauma is in the power of collective efficacy. Bandura (1995) and Parker (1994) examined the ways that the knowledge of one person can affect and impact the confidence of the group. Learning with one another and imparting knowledge to one another, through mechanisms such as PLCs, can make a difference in student success. Bandura (1995) estimated that the effects of collective efficacy and working together as a group have a deep impact on teachers and that impact results in more student success.

Final Thoughts

For the question of who we can ask for help? One crucial answer is each other. In PLCs educators gain the time needed to share their knowledge, skills, and talents to learn together how to be more effective with all students. If one educator has a great relationship with a student and another educator struggles to build a relationship, both educators can support one another. As educators, there is a common mission to provide the best education and experience for students. When we apply the core counseling competencies and effective strategies we have reviewed in this article, the classroom experiences and relationships is where abused and neglected students can find safety, security, trust, and their voices. Ted Lasso demonstrated, if educators ask questions and not judge, we can change each student's developmental trajectory. When we, as educators, are human and allow ourselves to feel and demonstrate empathy, we can assist students in healing. When we, as educators, acknowledge our bias and worldviews and depend on one another, we can more effectively meet students' social and emotional needs. This is the connection between trauma, attachment, relationships, and caring classrooms; and this is connection between us and Ted Lasso.

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Promoting Educational Equity with Teacher Mentor Programs

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Abstract

The United States is experiencing a critical teacher shortage impacting public schools in all regions. Unfortunately, high teacher attrition rates can contribute to educational inequity for students, creating situations in which some students receive a higher quality education than others. Unfortunately, teacher attrition tends to be most prevalent in low-income, high-minority schools and districts, exacerbating the issue of equity for these already marginalized communities. However, school administrators and teacher leaders may be able to increase teacher retention using research-based teacher mentor programs, which provide support for new teachers and empower veteran educators. When we develop and implement new teacher mentor programs that support veteran teachers as they seek to assist and empower our newest teachers, we may also help our veteran teachers feel their work and efforts make a positive difference. As a result, veteran teachers may feel energized to be positive forces in their schools. In the end, the design and implementation of such programs may increase job satisfaction and retention for all teachers who are involved. These ideas served as the motivation for a district administrator and me as we began our work to create, implement, assess, and refine a teacher mentor program in our district for the school year 2024-2025. In the summer of 2025, after several rounds of data collection, I will report on the effectiveness of the program results and make recommendations.

Keywords: educational equity, job satisfaction, teacher mentoring, teacher retention, teacher empowerment

Within the last decade, low teacher retention rates have contributed to what is now a critical national teacher shortage (Darling-Hammond, 2022). In 2017–2018, more than 100,000 teaching positions were left vacant and since then, more than 40 states have reported annual shortages in high-needs areas, such as math, science, and special education (Darling-Hammond, 2022). Between 2020 and 2022, the total number of educators working in public education decreased from 10.6 million to 10 million, a loss of 600,000 (Walker, 2022), and, as of December 2022, the teacher attrition rate was 16% (Nguyen & Kremer, 2022). More recently, in February 2023, more than three quarters of the country was in a teacher shortage (Jones, 2023). Sutcher et al. (2016) said it best when they wrote, “The teaching workforce continues to be a leaky bucket, losing hundreds of thousands of teachers each year—the majority of them before retirement age” (para. 7). As a nation, it is becoming more common for teachers to not only leave their positions, but the profession entirely (Jones, 2023).

When large numbers of teachers leave their positions, all students are negatively impacted (Kaufman & Diliberti, 2021). Some impacts include the loss of institutional knowledge, the hiring of underqualified teachers, bigger class sizes (Ronfeldt et al., 2013; Sorensen & Ladd, 2020), and the undermining of student achievement (Guha et al., 2016). However, when teachers leave their positions, students who are “the most disadvantaged . . . often confront the highest rates of teacher turnover,” (Williams et al., 2022, p. 2) because turnover rates tend to be higher in rural and urban schools with low socioeconomic status and/or a high percentage of underrepresented populations (Ingersoll et al., 2018). Typically, schools in the poorest communities are the ones most hurt by teacher shortages (Ravitch, 2020). Although poor teacher retention rates negatively impact all students, those who are most significantly impacted are those who are members of marginalized communities. The educational inequity lies here.

The Need to Increase Teacher Job Satisfaction

There are many reasons teachers choose to leave their position or the profession entirely, but low job satisfaction may be a prevalent cause. It might be plausible to argue that if

school districts want to retain teachers, administrators, and other school personnel, district leadership must work to increase teacher job satisfaction. To do this, administrators can provide teachers with autonomy (Dilekci, 2022; Fradkin-Hayslip, 2021; Mangin, 2021; Rosenholtz & Simpson, 1990; Urick, 2020), support them with meaningful professional development and growth opportunities (Cirocki et al., 2023; Rajeswaran et al., 2023; Tan, 2018), provide opportunities for them to support one another (Ladd, 2011), and find ways to empower teachers (Moultroup, 2024). While there are many strategies for increasing each of these elements of job satisfaction, which in turn may increase teacher retention rates, there seems to be one that some states have used with success—research-based teacher mentor programs (Fischer et al., 2022).

State-Mandated Teacher Retention Programs

In December 2022, Fischer et al. created a database that displayed 40 individual state profiles with reports on teacher retention data (10 states were not able to successfully collect, analyze, and report data). The researchers included the number of teachers who stayed in their position or remained employed in their district in a different position, as well as reasons teachers provided for leaving their positions. They also provided detailed information regarding each state's mandated teacher retention programs.

In total, 49 states (all but New Hampshire) employ some sort of required teacher retention and/or recruitment program (Fischer et al., 2022). Some states use only one program, but many require school districts to use several strategies for recruiting and retaining teachers. Programs and mandates range drastically from state to state, and include elements such as incentives for high school students to enter the education field, teacher mentor programs, minimum requirements for teacher planning time, teacher evaluation protocols, advanced teacher licensure, minimum teacher pay, scholarships and grants to recruit and keep teachers in underserved schools and/or shortage areas, loan forgiveness, additional compensation for teachers in shortage areas and underserved schools, and financial incentives for teachers of

color (Fischer et al.). Although state policy makers mandate teacher recruitment and retention strategies, many states are still seeing a drop in teacher retention. In fact, national research has shown 23% of teachers left their role in the 2022–2023 school year, and 29% of teachers in high-poverty schools did the same (Education Resource Strategies, 2024). Regardless of the implementation of these programs, states are still losing teachers at alarming rates.

Three states, however, according to Fischer et al. (2022), are finding success with maintaining high percentages of teacher retention and/or improving their teacher retention rates—Georgia, Kansas, and Maryland. When examining what these states have in common, it is clear they each have a two- or three-year required teacher mentor program (Fischer et al., 2022) that includes rigorous standards each district must meet and maintain. Perhaps, based on this observation, teacher job satisfaction and retention rates could be increased through the design and implementation of robust teacher mentor programs.

While each of the three states' program is different in its design and implementation, there are clear expectations and accountability for district leaders, school administrators, and teacher mentors. More specifically, in Georgia, some requirements include the establishment of a vision, mission, and goal for the teacher mentor program; setting specific criteria for recruitment and selection of mentors; and mentor participation in ongoing training. In addition, administrators and mentors are held accountable through regular data collection and analysis regarding the effectiveness of the program; communication of the established goals, vision, and mission; and adherence to a set of guidelines for mentor selection (Georgia Department of Education, 2024). Based on Georgia's teacher retention rate, it may be necessary for state governments to adopt some of these teacher mentor program requirements and accountability measures, especially if we want to increase the rate at which teachers remain in their positions and/or districts nation-wide.

Using Teacher Mentor Programs to Increase Teacher Job Satisfaction

The establishment or revision of a teacher mentor program may positively impact all teachers, not just those who are new to the profession. For new teachers, it is critical to have "robust mentoring and support programs" (Williams et. al. 2022, p. 91) that help to provide them with systematic support (Radford, 2017). These types of mentor programs, when proven to be helpful, can positively impact teacher self-efficacy, which may then increase the likelihood that newly hired teachers will stay in the profession longer (Han, 2023; Ingersoll & Strong, 2011).

As an additional benefit, mentor programs may also increase job satisfaction for veteran teachers who serve as mentors (McGee et al., 2023), likely because their participation in such programs strengthens their sense of empowerment and helps them improve their own practice (Guha et al., 2016). Also, if mentor teachers are given decision-making power when designing and implementing their mentor programs, this shared leadership approach may make it more likely for them to stay in their positions (Urick, 2020). Through intentional collaboration, administrators and teacher leaders may find themselves in a situation in which retention rates increase for veteran staff as well as their newest teachers,

Teacher Mentor Program Design and Implementation

At the start of the 2024–2025 school year, one district administrator and redesigned and began to implement a new teacher mentor program in our rural school district in New Hampshire. First, school administrators selected competent teacher mentors from the pool of candidates in each school building. They searched for and hired outstanding professionals who are in good standing, have demonstrated effectiveness as a teacher, and have either attended or will attend a district-approved mentor training program. Once mentors were hired, the district's curriculum coordinator and I developed and began to provide initial and ongoing training for mentors and administrators regarding the topics of adult learning theory and peer coaching models. Using this knowledge, teacher mentors and administrators began to collaborate to create and implement a teacher mentor program that includes a vision, mission

statement, and goals; the process for pairing mentors and mentees; agendas for monthly mentor/mentee meetings; mentor/mentee classroom observations; mentor accountability procedures; the role of administrators in teacher mentoring; support for mentors; design of data collection tools; data collection, analysis, and reporting; and any other program features decided upon by the group. As part of the process, and to assess the effectiveness of the program for mentors and mentees, teacher leaders and district administrators will collect and analyze data throughout this school year, using the mentor-designed data collection tools, which include input from both mentors and mentees. At this point in time, it is difficult to know what the data collection tool and process will look like because we are in the process of finalizing the tools. However, the data will be used to inform revisions to the teacher mentor program during the school year and for the following year, with the idea that some changes may need to be made to mentor training and any other ongoing systems within the program.

Future Reflections

It is the hope of this teacher leader that the mentor program design will have positive impacts on all those involved. First, ideally, teacher mentors will be empowered by being a part of the decision-making process. It is possible that this level of involvement for mentors may help them feel committed to the program and ensuring its success, resulting in consistent and meaningful revisions of the program to meet the needs of all educators involved. In addition, mentees should feel valued since the data collection tool will ask for their input regarding the program's effectiveness and changes that need to be made for future mentees. Lastly, and maybe most importantly, mentees might feel supported throughout their transition to a new teaching position. Ideally, the implementation of our program may boost teacher retention rates for those at all experience levels and, as a result, increase educational equity for students. My goal is to write a follow-up article regarding the data, the mentor program's level of effectiveness, any other pertinent knowledge that was gained as part of this process, and recommendations for implementing successful teacher mentor programs.

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Multilingual Learner Program Instructional Document Content Analysis in a New Hampshire Public School

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Abstract

Multilingual learners (MLL) are a large and growing group of disadvantaged students in the United States public education system who come from refugee and immigrant backgrounds and require linguistic instruction, in addition to content instruction. MLLs are entitled to language instruction, and school districts receive additional funding for these services under the Office of English Language Acquisition. However, data and documentation of the quantity and quality of the linguistic additive instructional services have yet to be defined in educational policy. Through this exploratory document analysis study, the data discovered in 30 MLL documentation files in a public education setting were found to be scarce and disjointed. While the files contained a predominant amount of summative assessment data on English language proficiency, there were limited instructional data documenting the quality and quantity of the additive instructional experiences. The findings suggest the need for clearer directives on MLL data documentation and enhanced data documentation variety beyond demographic and summative data sets. Enacted instructional data was amongst the documentation greatly absent from the MLL files, leaving much to ponder regarding the instructional services received by MLLs in public educational settings. Without this data, how can accurate decisions be made about student programming?

Keywords: multilingual learners (MLL), Every Student Succeeds Act, Title III, additive instructional settings, equal access, equity, MLL documentation, data-driven decision making

Current research has determined multilingual learners (MLLs) as one of the most underserved populations of students in the United States educational system today (Fowler & Brown, 2018; Wiseman & Bell, 2021). With the growing population of MLLs (National Center of Educational Statistics [NCES], 2023), quality, research-based decisions for educating these students are needed more than ever before (Wiseman & Bell, 2021). The Title III, Language Instruction for English Learners and Immigrant Students program, from Every Student Succeeds Act, attempts to serve MLLs, but even this federally-mandated accountability program has struggled to provide educational data of Title III students (Wiseman & Bell,2021). This often means that English language educators lack the necessary assessment data and behavioral data to show student progress in learning and development (Fowler & Brown, 2018; Wiseman & Bell, 2021) and to make educated and appropriate instructional decisions (Dodman et al., 2021). Despite the legislation and drive for equitable education, there is still limited research on documentation for MLLs in general education settings and additive instructional settings (Fowler & Brown, 2018; Wiseman & Bell, 2021). Furthermore, without data evidence, the educational system lacks the ability to differentiate opportunities to learn (OTL) for a diverse group of learners (Kurz, 2018), especially in Title III additive instructional settings (Fowler & Brown, 2018; Wiseman & Bell, 2021).

MLLs have the right to a fair education, including the right to learn and equitable access, despite a linguistic barrier (Education Law Center, 2022). Yet, the racial/ethnic achievement gap is evident in state standardized assessment data, and mitigating the negative racial-ethnic achievement trend is on the minds of countless constituents, state educational agencies, school districts, administrators, teachers, and families (Wiseman & Bell, 2021). To paint a clear picture, the first questions frequently asked are, “What is working well?” and “What could be better?” However, the responses fall short without the existence of enacted MLL data. Data make the perceptual landscape lush (Finn, 2022). While not a new concept, individualized language plans (ILPs) have emerged as a data tool, the “*IEP of* multilingual learner programs (MLPs),” but the

regulations around these plans have been varied, unclear, or not widespread (Thompson & Rodriguez-Mojica, 2023).

At this stage in the research, MLL documentation is generally defined as the documents compiled and organized from an MLL's educational setting to be used in a meaningful way to guide instruction and create reports on the data collected on the effectiveness for the betterment of the students. While some districts provide vague lists of which documents should be collected in MLL files, I wanted to explore if this document guidance was being followed or if files are missing key components for data-driven decision making (Mandinach et al., 2006]. The United States educational system needs better educational documentation, data, and instructional accountability for MLLs (Wiseman & Bell, 2021).

Literature Review

National achievement data are worrisome across the field of education, especially for culturally and linguistically diverse students (Fowler & Brown, 2018). According to Wiseman and Bell (2021), standardized assessments offer the only educational insight available for multilingual learners in most states. On a national level, achievement data demonstrated a significant racial-ethnic achievement gap (Fowler & Brown, 2018). And yet, so little is known regarding the education of multilingual learners, due to the lack of additive instructional servicing data available for this underserved group of students. The achievement gap for culturally, linguistically, and ethnically diverse students has posed a great concern for multiple decades (Beecher & Sweeny, 2008; Fowler & Brown, 2018).

For many decades, traditional methods of data collection have been used to document services provided by MLL educators. The most common form of traditional data collection has been paper-and-pencil methods, such as records of schedules, attendance, and possibly even servicing notes. Some MLL educators have kept minimal evidence documenting MLL service monitoring. In the cases where an educator has kept detailed paper records, their bookshelves are often filled with binders full of pages of notes of servicing data (Leone, 2023). If a district is

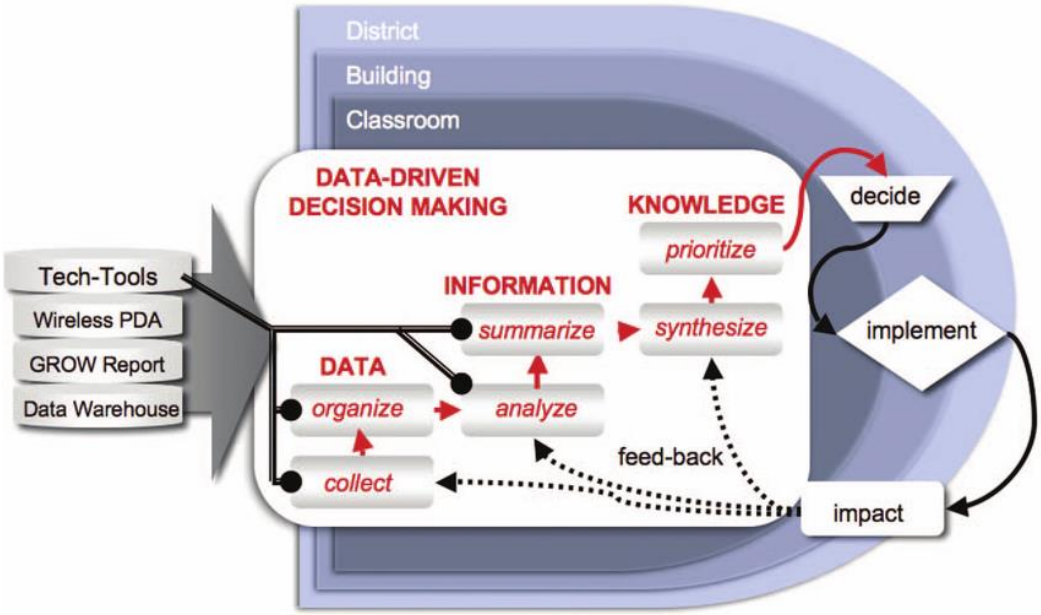
audited for funding compliance or an administrator needed information on a student's total servicing time, reporting is going to be incredibly challenging even with the most organized system.

Heiskanen et al. (2019) researched how educators created and used sequential pedagogical documents for children with special educational needs and found four patterns of support documentation: missing, repetitious, disorganized, or explicit. Explicit was the ideal category of documentation. Only 13% of the documents reviewed were explicit examples where "support was evaluated and developed systematically" (Heiskanen et al., 2019, p. 333). Of the support records, 87% were lacking—imprecise, vague, incoherent, or nonexistent, which made it impossible to interpret the student data correctly or trust the analytics determined from the data calculations using these records. I believe this is likely the case with examples of MLL data as well.

Data-driven decision-making (DDDM) is a process of identifying data, collecting it to be analyzed and interpreted, and using it to set goals to improve educational experiences (Mandinach & Schildkamp, 2021a). According to the DDDM conceptual framework in Figure 1, data come from many modes, methods, and sources (Mandinach et al., 2006). The *data* enter as raw, unaltered form and through analysis, *information* is assigned meaning within a context (Mandinach et al., 2006). Lastly, turning data to *knowledge* allows for effective instructional planning and future implications. After the information progresses through these three components (i.e., data, information, and knowledge), decisions are made, implemented, and assessed for impact, which leads to the feedback loop with further information to use in subsequent DDDM processes. Using the DDDM framework fosters a culture of continuous growth focused on student learning compared to a culture of compliance regarding student learning (Dodman et al., 2021). The MLL documentation within student data files is in the *data* section of the DDDM process displayed in Figure 1.

Figure 1

Data-Driven Decision-Making Framework



Note: Based on information from Mandinach et al., 2006.

Data Literature

Educational data literature is vast. Kurz (2018) addressed the lack of data in student subgroups as “the missing link” (p. 1) between knowledge and quality educational decisions. According to Buzhardt et al. (2020), DDDM is how educators use student data to inform educational decisions, and it is an essential component of a multi-tiered system of support approach, which is driven “from formative progress-monitoring measures of students’ growth in the school curriculum” (p. 75). Meaningful data are imperative, complex (Mandinach & Schildkamp, 2021a; Mandinach & Schildkamp, 2021b), and inform insight that drives decisions that enhance learning (Fernando, 2020). Fowler and Brown (2018) described the intended purpose and use of data:

> The purpose of collecting, disaggregating, and consuming data is to better improve teaching and learning practices for students. This cannot be done in a way that does not

> take into account the learning needs of students, which is why data should begin to inform the conversations around equitable outcomes for students based on the student's relationship with the teacher, the educational system, and their learning processes. (p. 24)

Data variety make the perceptual landscape lush and are essential to the process of turning data into useful knowledge (Finn, 2022).

According to Fitzpatrick and Margolin (2004), data usually fall into 4 categories: achievement data, demographic data, program data, and perceptual data. Achievement data are the most universal measure when considering data influencing educational policy and decisions (Dodman et al., 2021; Portz & Beauchamp, 2022). Unfortunately, the only universally recognized and required documented MLL educational data used nationally are yearly English language proficiency assessment achievement test scores (Fowler & Brown, 2018). Without adequate and varied data and metrics available, the process of asking questions to guide data-informed decisions cannot occur effectively (Shaked, 2010).

MLL Data Documentation Literature

According to Wiseman and Bell (2021), educational data for MLLs are usually "anecdotal, limited in scope, or related to population size rather than disaggregate-able experiences" (p. 2). Furthermore, language proficiency data are the only educational data available on MLPs and MLLs (Wiseman & Bell, 2021). The lack of empirical, publicly available, systematically collected, disaggregated data makes it impossible to conduct cross-national analyses, limiting policymakers' ability to make equitable, data-driven decisions (Wiseman & Bell, 2021). Accountability structures tangibly increase student scores (Fowler & Brown, 2018). However, the specific academic and linguistic needs of this subgroup have never been identified due to the lack of data (Wiseman & Bell, 2021).

MLL data are centered around a single yearly achievement data score (Fowler & Brown, 2018). A single standardized assessment does not provide enough metrics to demonstrate

progress monitoring or equitable accountability to this underserved population (Fowler & Brown, 2018; Wiseman & Bell, 2021). As such, the question becomes: What is the most effective way to standardize the documentation of the instructional services received by the complex, growing subgroup of MLLs? Over the decades, some traditional documentation methods have been used to document student services (Ruf, 2012). The most common form of traditional documentation is paper-and-pencil methods (Ruf, 2012). Some educators keep very minimal evidence of documentation and MLL service monitoring (Wiseman & Bell, 2021). Traditional documentation methods are archaic, nonuniform, and difficult to transition the data to reports for audits on compliance (Fowler & Brown, 2018).

MLL data files, frequently called cumulative folders, are the documentation center for student data and progress monitoring. According to Law and Eckes (2016), when systemizing a documentation process, a district should decide who the audience will be and how documents will be used. The primary goals of student cumulative folders are to offer a combination of data varieties to show students' strengths and weaknesses for student instructional development and future use by other educators (Law & Eckes, 2016). Lawrence Public Schools (2013) in Lawrence, Massachusetts and the Texas Education Agency (2020) included the following documents in their districts' MLL cumulative folders:

- Home language survey
- Assessment and placement portfolio
- Signed parent notification letter
- Initial entry assessment
- Student schedule and Sheltered English Immersion Program (SEI) placement (Lawrence Public School only)
- MLL student support plan
- Annual English proficiency scores
- State test scores (with student's success plan if scores need improvement)

While some school districts have developed MLL cumulative folder documentation lists or national directives on MLL, documentations have yet to be found (Fowler & Brown, 2018; Wiseman & Bell, 2021). Cumulative folders are required to be kept and maintained for five years after a student graduates or leaves the school district (Lawrence Public Schools, 2013).

The Teaching English to Speakers of Other Languages (TESOL) International Association is a professional community acknowledged worldwide for ML learning opportunities, research, standards, and advocacy. The TESOL Principles of Exemplary Teaching of English Learners includes both knowledge of students (TESOL, 2023a) and monitoring and assessing English language proficiency growth (TESOL, 2023b). These standards are encouraged to "provide teachers with the knowledge to make informed decisions to improve instruction" (TESOL, 2023c, p. 7). *Principle One: Know Your Learners* encourages educators to obtain data on MLLs linguistic and academic backgrounds (TESOL, 2023a), and *Principle Five: Monitor and Assess Student Language Development* suggests teachers should maintain records to monitor errors, utilize formative assessments, and take a collaborative approach to the shared responsibility of educating MLLs, called School-Wide English Learning (TESOL, 2023b). These principles are best practices for the English language development (ELD) field, but the enactment of these standards has yet to be represented in the ELD literature on data documentation.

A thorough examination of existing research revealed no uniform documentation standards for MLL folders have been discovered (Boyle et al., 2010; Carney, 2020; Wiseman & Bell, 2021). Even though data has proven to be a valuable tool for influencing quality decision-making (Boudett et al., 2015; Ikemoto & Marsh, 2007; Mandinach et al., 2006) and the TESOL International Association identified monitoring and assessing student language development as one of their six principles of exemplary ML teaching (TESOL, 2023c). As of 2023, instructional data collection has rarely occurred in MLPs; where it did, the data lacked explicitness and overall coherence across the field (Fowler & Brown, 2018; Leone, 2023;

Wiseman & Bell, 2021). For this reason, an empirical rationale for the present study exists to examine the contents of MLP data files. Due to the time constraints for this study and my ability to gain permission to access files, I decided, with my administrator's support, to review files in one New Hampshire public school.

Methodology

There has been a growing need for a synchronized mode and method of MLL data collection across education (Leone, 2023). Situated in the grounded theory methodology (Charmaz, 2014), the purpose of this document analysis study was to explore the evidence and quality of MLL data. Due to time constraints and availability of access, in this study I examined records at one New Hampshire school. The findings of this study provided, for this school, insight into what documents MLL files currently include and do not include, and this can help direct future discussions and guidance on what documents MLL folders should include. The results in this study might also generate interest in reviewing the data from other schools in our state and other states.

Research Questions and Hypothesis

The primary research questions that guided this study were:

1. What is the range of formats used for documenting data collection for English as a second language instruction?
2. What is the quality of data collection for English as a second language instructional documentation?

Based on prior research demonstrating disunity in MLL data collection (Leone, 2023), I hypothesized that MLL documentation would lack tools (formats) and precision (quality) for documenting additive instructional scenarios.

Methods

The exploratory qualitative document analysis design (Bowen, 2009; Bretschneider et al., 2017) involves inference based on the formats and quality of data collection for multilingual

learners in additive instructional settings in a New Hampshire public school. The principal investigator (i.e., the author) selected 30 MLL document files to be coded for evidence of progress monitoring. Documents likely found in MLL files include demographic information, program permissions, attendance records, progress monitoring records, instructional data, and assessments. The type of materials used were the focus of the data collection. There was no connection to the student data. The data collection was a one-time action that took approximately 30 minutes for each file. Bowen (2009) described document analysis as a "systematic procedure for reviewing or evaluating documents . . . to elicit meaning, gain understanding, and develop empirical knowledge" (p. 27).

This review followed grounded theory methodology (Charmaz, 2014) to explore the contents of the MLL files. While the field of MLL does not provide specific guidelines for data collection, analyzation, and reporting (Leone, 2023), grounded theory is a research strategy to explore the existing documents on instructional data for learners in MLL programs included in the files starting with a blank slate (Charmaz, 2014). Once the initial list was created, focus coding was used to narrow down and organize the original list of codes. By allowing the data to initially guide the development of the codes, the final data are more closely connected to the codes and hence, the findings.

Participants

The study featured 30 files of MLL administrative records (n = 30) from a New Hampshire school. A pool of over 80 potential student files was available, but only 30 were physically chosen. In this way, all documents were chosen based on study compliance of being enrolled as an MLL participant.

Data Collection Instrument

Bowen (2009) explained that document analytics use the process of "finding, selecting, appraising, and synthesizing data contained in documents" (p. 28). The analysis methodology for the format of data present used grounded theory ontology and coding. After this initial list of

codes was created, the second level of coding focused on the format, quantity, and quality of documents collected in the file (Saldaña, 2021).

As MLL files do not currently have uniformity, guidance, or direction (Leone, 2023), the analysis of the quality was modeled after the special education file research of Heiskanen et al. (2019). Heiskanen et al. examined how 172 educational sequential care plans were examined for patterns of descriptions for support measures. The documentation practices were determined to be: missing, repetitious, disorganized, and explicit (Heiskanen et al., 2019). Table 1 displays the definitions for each category.

Table 1

Type of Document Quality

Missing	Description of support were lacking entirely
Repetitious	Illustrates a plan for support; descriptions are brief, nonspecific, and repeated almost identically from one recording to another
Disorganized	Support is described in a precise and unambiguous manner, yet not as a systematic feature as the linguistic features in the other patterns are, as the support can be unambiguous and general
Explicit	Support is evaluated and developed systematically

Data Analysis

The data were organized, cleaned, and sorted into four data sheets: Attendance, Instructional Data, Formative Assessments, and Summative Assessments. Since the expectation in schools usually require all important information to be present in all files of students, my analysis focused on what information was present and what information was not

present. The review of the files showed that all categories of information were missing in some files.

Findings

The following sections outline the findings of the data analysis. Examining the visual representation in Figure 2, the larger the word's depiction, the more frequently that document was in the files. Twenty-seven (90.00%) of the files included WIDA Screener, the tool used to assess whether or not students are EL eligible, and all 30 (100.00%) of the files contained WIDA ACCESS, assessments used to assess EL progress. Two other types of documents found in the files included 19 (63.33%) Individualized Language Plans and 11(36.67%) Designated Accommodations. Additionally, three (10.00%) of the files included progress reports.

Figure 2

Frequency of Document Format

These data indicate that important information was missing in files. These data indicate that the fact that there are no explicit guidelines relating to what information should be in each file has led to missed information that educators should have to make important decisions about EL students. In other words, how can educators make clear and accurate instructional decisions

with incomplete data? For example, 90% of the files reviewed were missing progress report data that must be available for accurate planning for teachers and students.

The data, as displayed in Table 2, give a clear picture of what files in this study contained and what was missing in EL files. The data show that 30 (100.00%) of the files contained WIDA ACCESS as a summative assessment; 27 (90.00%) of the reviewed files had a WIDA SCREENER to determine EL eligibility; 19 (63.33%) of the files contained an Individualized Language Plan; 11 (36.67%) of the files contained designated supports and accommodations; 10.00% of the files contained progress reports.

Table 2

Frequency of Document Formats

	Designated Supports & Accommodations	WIDA SCREENER	WIDA ACCESS	Individualized Language Plan	Progress Report
Present	11	27	30	19	3
%	36.66%	90.00%	100.00%	63.33%	10.00%

When examining the quality of instructional data documents, as displayed in Table 3, they were missing from all 30 (100.00%) MLL files. Conversely, Table 3 also shows that instructional data was explicitly outlined in 18 (60.00%) of the MLL files. Instructional data was explicitly described in the Individualized Language Plans (ILPs), but in examining this document further, there were only a series of goals and instructional group plans. The ILPs did not have an element of enacted data. The other 12 (40.00%) of the MLL documents were missing instructional data. Table 3 also displays the summative assessment documents present in the MLL files. Summative assessment documents were present and explicit in all 30 (100.00%) of MLL files. The WIDA ACCESS language proficiency score reports were the mode of all 30

(100.00%) of the summative assessments. Formative documents were missing in 28 (93.33%) of the files, and in the two files (6.67%) that contained formative data, they were disorganized.

Table 3

Quality of Documents

Document Types	Data Types	Missing	Repetitious	Disorganized	Explicit
Attendance Document	*n*	30	0	0	0
	%	100.00%	0.00%	0.00%	0.00%
Instructional Data*	*n*	12	0	0	18
	%	40.00%	0.00%	0.00%	60.00%
Formative Documents	*n*	28	0	2	0
	%	93.33%	0.00%	6.67%	0.00%
Summative Documents	*n*	0	0	0	30
	%	0.00%	0.00%	0.00%	100%

Note: *****Instructional data contained 0 enacted data.

Interpretations & Recommendations

The data findings highlighted some important interpretive conclusions which can guide recommendations. First, the only document format that was collected frequently and consistently in the folders was summative assessments (*n* = 100%). Summative assessments included the nationally required annual language proficiency assessment and a language proficiency screener. Summative data is considered achievement data from Fitzpatrick and Margolin's (2004) data categories (achievement data, demographic data, program data, and perceptual data). While achievement data is very influential in decisions of educational policy

(Dodman et al., 2021; Portz & Beauchamp, 2022), the lack of data variety counteracts the recommendations presented in research literature on effective data use (Finn, 2022). The emphasis on more data variety is substantial in the literature (Finn, 2022; Vail, 2022; Wiseman & Bell, 2021), and this study supports the interpretation that a more varied spectrum of MLL data in documentation would be greatly beneficial.

Some directives could be useful in MLL education for greater uniformity, compliance, and accountability. The cumulative folders that were analyzed had a variety of documents, which leads to the conclusion that teachers are unsure which documents should be included in an effective cumulative folder. Teachers should receive professional development (PD) on data efficacy and data-driven decision-making (DDDM) to help them process the importance and usage of data documents. By utilizing quality and specific PD experiences, ELD teachers would likely document and analyze more data (Gesel et al., 2021; Kennedy, 2016), feel greater data efficacy (Dunn et al., 2013), and better use data and findings to inform instruction (Dodman et al., 2023). PD is a highly effective strategy for engaging data practices (Kennedy, 2016; Schnellert, 2020) and would likely have a positive effect if implemented on MLP in New Hampshire.

Consistent with earlier findings of the limited existence of process data in MLL data (Leone, 2023), instructional data was the least common type of data documented in MLPs, missing in 90% of the files. In three of the cumulative folders (10.00%), a progress report was present. Enacted instructional data is documentation of instructional practices that occurred in the past and can be recorded as factual (Kurz, 2018; Rowan et al., 2004). Enacted instructional data documents were missing from all 30 MLL files (100.00%). My review of the data found that cumulative files of older students tended to include more instructional documents and formative documents, meaning that files of older students were more likely to include beneficial documentation. Since this was a small sample, this concept needs more research. Individualized Language Plans (ILP) were found in 60.00% of the data files outlining a series of

goals and instructional group plans, but these plans do not account for what *actually* happened to teach these goals effectively. As stated, the ILP does not have an element of enacted data. Enacted instructional data could be a missing link in MLL documentation for effective DDDM.

The concept of enacted instructional data documentation is not widespread as best practice yet, as many teachers still consider a lesson plan before instruction to be instructional documentation. I would ask these teachers to consider how often lessons change with minimal notice. According to Rowen et al. (2004), enacted curriculum refers to the actual daily experiential operations of the intended curriculum and the instructional decisions made based on the process. The space of misalignment between the intended curriculum (lesson plans) and the enacted curriculum devalues lesson plans as instruction documentation.

Finn (2022) suggested the importance of an effective data system in educational systems and the reluctance of some educators who view data as the means to results-based accountability, which was described by educators as “embarrassing, punitive, and a rejection of professionalism” (p. 13), and not a ripe environment for quality DDDM. However, this mindset is inconsistent with the present findings and research literature, and more specific data directives might be one answer to increasing the documentation of data in MLP. Based on these findings, I synopsize with the following recommendations:

- MLL documentation needs to be varied and inclusive of instructional process data
- Enacted instructional documentation (e.g., progress monitoring, enacted instructional progress) is a useful component of a cumulative folder and could be used more regularly and consistently
- Professional Development could assist with teachers’ data efficacy for better documentation and processing

Conclusions

This qualitative document analysis study explored the MLL documentation in a New

Hampshire public school. The findings from this study begin the exploration into understanding the types of MLL data documentation that exist and the quality of this documentation. The compilation of the present findings and research literature provides a cross-sectional snapshot of the MLL documentation practices of ELD educators in New Hampshire and evidence of the need for richer data documentation in the MLL subgroup (Fowler & Brown, 2018; Garver, 2022; Wiseman & Bell, 2021). With more professional development on documentation and data literacy, educators and administrators can: (a) gain great insight by examining their current data collection and analyzation practices for MLLs in their educational care, (b) consider the findings of the present study to determine the importance of documentation for MLP and use this to improve current practices and increase accountability, and (c) consider creating a norm for quantity and quality of documentation in their current practices. To reach these goals, future research on ELD data collection and analyzation across the United States, the uniformity of MLP documentation data practices, and the influence of Federal ESSA Title III programming, should be completed.

Further study with a larger participant pool within the MLL population would benefit the research literature on data collection practices in the MLL field. However, from this relatively small sampling, conclusions can already be detected about the inconsistency of data documentation within MLL files. Not only would further research prove of high worth, but directives on the national or state level would also bring clarity to the benefits and expectations around data collection within the MLL field. Considering the literature regarding MLL cumulative folder contents (Law & Eckes, 2016; Lawrence Public Schools, 2013; Texas Education Agency, 2020) and ELD educator reports of collecting data more frequently than suggested by this research (Leone, 2023), there is evidence that the lack of uniformity in MLP data practices greatly affects the limited use of data documentation in the field.

Based on the findings from the present study, I can affirm three recommendations to improve MLL documentation. First, MLL documentation needs to be varied and inclusive of

instructional process data. More specific data directives from educational leaders might be one answer to increasing the documentation of data in MLP. Namvar and Intezari (2021) found that data documentation too often lacked explicitness. Vail (2022), Garver (2022), and Finn (2022) reported that local education agencies and state education agencies failed to provide direction on DDDM. Second, enacted instructional documentation (e.g., progress monitoring, enacted instructional progress) is a useful component of a cumulative folder and should be used more regularly and consistently in MLP documentation. Third, PD could assist with teachers' data efficacy for better documentation, as research shows that PD experiences on MLL data documentation were extremely limited (Leone, 2023).

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Expanding Higher-Order Thinking Skills Through Academically Productive Talk in the Middle School Science Classroom

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Abstract

In this small, mixed methods pilot study twenty-three 5th graders and two 6th graders from a large, urban middle school in the Northeast United States were given Accountable Talk (AT) sentence stems to use during a series of academically productive talk (APT) in their science classrooms over a 2-week period in the Spring of 2024. The goal of the study was to assess whether and how ATP, the independent variable, might lead to higher-order thinking (HOT), the dependent variable, an area of great focus within our school district and something which I believe is essential for success in life. I observed and recorded student discussions, and later evaluated the data using a higher-order thinking coding tool. Students were also given a CER-type (claim, evidence, reasoning) assessment at the conclusion of the intervention, which was compared against a similar assessment given to them in October 2023. The observed participants and two participating teachers were interviewed at the end of the study to triangulate quantitative results. While the study yielded modest quantitative results, a connection was made between the quality of the questions asked by the teachers and students' use of HOT in their discussions and their CERs. The 6th grade students demonstrated higher rates of HOT versus the 5th grade students, who had received less robust discussion questions, though the 5th students made more progress during the study than did the 6th grade students. From the results of this pilot study, I have recommended continued research into the important connection between student academically productive talk and higher-order thinking in our school.

Keywords: accountable talk (AT), higher-order thinking (HOT), academically productive talk (APT), claim, evidence, reasoning (CER) thinking, academic conversations

From my experiences as a teacher, I have come to believe academically productive talk (APT) and higher-order thinking (HOT) are both essential for student academic success. As a K–12 educator for 20+ years, I am passionate about student growth and achievement and eager to learn about effective strategies in the classroom. I am now an instructional coach at a Massachusetts public middle school, that has begun to emphasize the use of APT and HOT. However, our school and district have not yet reviewed the research or validity behind the tools we are investigating in regards to positive academic outcomes. Through researching student discourse and HOT as part of this study, I now appreciate just how critical APT and HOT really are. Prior research studies have indicated APT leads to better academic outcomes for students (Applebee et al., 2003; Aranda et al., 2020; Michaels & O'Connor, 2012; Osborne, 2010; Soysal, 2021; Soysal & Soysal, 2022). Further, there are multiple research studies showing APT *leads* to HOT in students (Perra et al., 2016; Soysal, 2021; Soysal & Soysal, 2022).

I believe students in the school district in which I work would benefit from educators that more deeply understand the value of APT and HOT skills and *how* to use and develop both in the classroom. However, the impact of APT and HOT go far beyond our city's public schools. All students deserve to experience engaging, challenging classes every day. Teachers who have their students argue compelling academic questions would certainly elevate the rigor of any classroom and instill higher-order thinking skills in young people (Perra et al., 2016; Soysal, 2021).

In this experimental design, mixed methods pilot study, students in 5th and 6th grade science classes at a large, urban middle school in the Northeast United States engaged for one to two weeks in purposeful, academically productive talk using an accountable talk protocol with an emphasis on building, sharing, and responding to arguments about topics aligned to a current science standard. Students discussed compelling questions that lent themselves to lively interactions and HOT. I observed and recorded a few students in each class multiple times over the course of the two weeks and coded student utterances for instances of HOT. At the

end of the intervention, students completed a claim, evidence, reasoning written response (CER) on the same topic they discussed. This data was compared against a preintervention CER from earlier in the school year, which had already been graded. Following the intervention, I also interviewed the same students I observed to learn what the experience of engaging in regular classroom APT was like for them. I also interviewed the two teachers whose classes I observed to hear their thoughts on the impacts of the intervention in their classes. All data were used to triangulate my research questions around whether APT leads to increased HOT (verbally and in writing) in middle school science students. Research questions for this study included: 1. In what ways does academically productive talk (APT) in the science classroom relate to higher-order thinking (HOT) for middle school students in an urban school environment? 2. In what ways do compelling, higher order thinking questions, in the science classroom, relate to the quantity and quality of higher order thinking (HOT) for middle school students in an urban school environment?

Important Terminology

Academically Productive Talk (APT)

Academically productive talk is a process in which teachers encourage and support all students to think deeply and critically, articulate their reasoning, and listen with purpose in order to more deeply understand and integrate their learning. This is accomplished by structuring discussions that help students to articulate their thinking, exposing students to different points of view, asking students to respond to questions or challenges to their ideas, and revealing areas where more investigation might be necessary (Michaels & O'Connor, 2012; Shwartz et al., 2009).

Accountable Talk (AT)

Accountable talk (a form of ATP) refers to classroom discussions that are scaffolded by the teacher to allow students to engage in focused, coherent, and deep conceptual understanding with each other. Students are motivated to participate and eager to share their

thinking with others. AT includes accountability to the community by showing respect and listening to students' peers, accountability to accurate knowledge—sharing evidence-based ideas, and accountability to rigorous thinking or the ability to accurately create and defend argumentative claims (Michaels et al., 2013).

Higher-Order Thinking (HOT)

Higher order thinking (HOT) goes beyond rote memorizing and the retelling of facts. HOT requires students to take what they have learned and do something with it, such as deeply analyzing the concept, connecting or applying it to a new situation or idea, evaluating its reliability or creating a new solution. According to the Hess Cognitive Rigor Matrix (CRM), the highest form of HOT in the math-sciences is the ability to synthesize information across multiple sources and/or to create or design a model to solve a practical or abstract situation (Hess, 2013).

Claim, Evidence, Reasoning (CER)

Claim, evidence, and reasoning (CER) refer to creating an accurate *claim* (i.e., an argument or a position on a topic based on sound *evidence*). Further, students must show the connection between their claim and evidence with *reasoning*. The ability to do these three steps is an example of higher order thinking as defined by Hess (2913)—to analyze and draw conclusions from data, citing evidence.

Accountable Talk Stems

Accountable Talk Stems are sentence stems or frames teachers frequently provide to students as they begin to engage in AT conversations. Common stems might include, "I agree with you because . . ." "I disagree because . . ." "I used to think this but now think that because . . ." These stems or frames can be helpful in holding students accountable to the core purposes of accountable talk when they are first starting out, but can be discontinued once students use them with fidelity on their own (Michaels & O'Connor, 2012).

Compelling Higher Order Questions

Compelling HOT questions are those that elicit higher order thinking and engagement from students. They are usually open-ended questions with no one right or wrong answer. Questions on controversial, ethical, and/or debatable topics are also compelling, students want to answer them. Some examples of compelling HOT questions include: (a) Do you think people in a poor community in India were justified in stealing fresh water from the neighboring wealthy community when they had no access to clean water? (b) Could scientists bring dinosaurs back to life and if so, how would they do this, and if they could, should they? These questions require students to apply their background knowledge, build a claim using evidence and reasoning, and potentially to engage in a back-and-forth APT discussion with their peers who may have a different position (Stanley, 2020).

Literature Review

According to The New Teacher Project (TNTP, 2018), the majority of U.S. students do not currently feel engaged or excited by their studies in grades 6–12 classrooms. The authors of TNTP (2018) reported classrooms are lacking regular student-centered activities such as discussions and arguments and truly cognitively demanding work that leads to HOT. Numerous studies, including major meta-analyses, have demonstrated the importance of classroom discourse around compelling questions and rigorous work as having a significant positive impact on student academic performance (Hattie, 2023). These and other studies have shown a connection between academically productive talk and higher-order thinking (Perra et al, 2016; Soysal, 2021; Soysal & Soysal, 2022). Science education, in particular, has been taught in a manner whereby the teacher knows all and gives unequivocal content to students (Osborne, 2010). Fortunately, this is changing with the adoption of Next Generation Science Standards in schools throughout the United States, including in Massachusetts [Massachusetts Department of Elementary and Secondary Education (MA DESE), 2016]. The present emphasis in science education has students doing the work of scientists and learning through inquiry and discussion.

This is encouraging, as much prior and current research ties student success in science to academically productive talk and work that elicits higher-order thinking (Osborne, 2010; Soysal, 2021). Another tangential benefit of APT is it tends to improve the culture of a classroom (Howell et al., 2011).

The Urgency of Higher-Order Thinking Skills (HOT)

According to the authors of this groundbreaking, massive study on student academic achievement in the United States (TNTP, 2018), only 17% of students met grade-level standards, while successfully mastering 71% of their schoolwork. The discrepancy lies in the quality of *content* and *instruction* many students, particularly students of color, those learning English (multilingual learners), and low-income students, receive day-to-day in school (TNTP, 2018). Their mixed-methods study was conducted in a variety of different school districts around the country representing a wide-mix of student demographics from elite charter schools to failing schools on the verge of being shut down. The researchers reviewed student data (grades 3–12), observed thousands of classrooms, and had students evaluate their own level of engagement throughout the school day. They also interviewed and surveyed students and teachers. TNTP (2018) found the key indicators of a high-quality academic experience included: (a) consistent opportunities to work on grade-appropriate assignments, (b) strong-instruction that allows students to do most of the thinking, (c) a sense of deep engagement in what students are learning, and (d) teachers who hold high expectations for students.

Across all classrooms TNTP (2018) observed, teachers were only offering students grade-appropriate work 26% of the time. Further, teachers on average allowed students to do the cognitive heavy-lifting in class for about 29 out of every 180 hours of core academic instruction. Additionally, half of the 2,000 students, who rated their level of engagement throughout the school day, experienced something in class that was both engaging and worthwhile. The researchers also reported, that number decreased as students went up in grade (TNTP, 2018). The long-term impacts of this lack of rigor and engagement effected more

than low test scores. I believe students' livelihoods and futures are at stake; to me, this research indicated students simply cannot wait for engaging, challenging instruction and content.

The TNTP (2018) team laid out underlying reasons for these shortcomings in grade-level appropriate work and cognitive rigor. These issues are nationwide, not just in my school district or state. However, the bright side to this study, and the hope for CAMS, is the fact that educators can make shifts in their assignments, instruction, and engagement strategies, and increase their expectations of students. From the evidence in this literature review, I have developed a recommendation for further development of the system in our school to attempt to close the achievement gap by using student academically productive talk (APT) to engender HOT.

A focus on developing students' critical thinking skills is evidence-based as noted by Stanley (2020) in, *Promoting Rigor Through Higher Level Questioning*. Stanley wrote, "Using higher level questions in your classroom improves student achievement, builds understanding and retention of learning, increases student engagement, asks students to think for themselves, and teaches valuable 21st-century skills" (p. 13). Stanley also cited John Hattie's (2008) meta-analysis work that found a strong connection between student academic achievement and cognitively demanding work in the classroom. For example, cognitive task analysis, classroom discussions, evaluations and reflections, problem-solving teaching, and questioning all have an effect size well above .40, which makes them visibly significant. Hattie termed any effect size above .40 as being visible to the teacher in the classroom. Like TNTP (2023), Stanley (2020) wrote how little teachers engaged students in HOT and HOT questions in the classroom.

What Is Lacking in Science Education Today

Many researchers have written about the need for APT and HOT within science education. For example, Osborne (2010) argued science education was lacking in *argumentative discourse*. According to Osborne, "Critique is not, therefore, some peripheral feature of science, but rather it is core to its practice, and without argument and evaluation, the

construction of reliable knowledge would be impossible" (p. 464). I believe, in conjunction with Osborne, students need to do the work of scientists and question and argue viewpoints, rather than learn a list of facts. Osborne noted several research studies showing students who participated in discourse or debate about science topics first, performed better on assessments of these topics. They noted the work of coming up with a logical argument called upon higher-order thinking skills.

Osborne (2010) wrote, "Argumentation in science education requires students to construct and evaluate scientific arguments to reason scientifically" (p. 465). Osborne's biggest point was argumentation is important in science classrooms and that it leads to HOT. Osbourne also talked about how science is often taught as a "monolith of facts" (p. 464), and this is not ideal or close to the real work in which scientists engage. They noted good *discussions* in the science classroom did not happen organically; they needed to be carefully structured by teachers. They ended by suggesting this is an area ripe for further investigation.

Many authors also described how classroom discussions are often one-sided and fall short of building HOT. Applebee et al. (2003), Michaels and O'Connor (2012), Shwartz et al., (2009), and Soysal (2021) all noted how the typical IRE format where a teacher initiates (I) a question to the entire classroom, a student responds (R), and the teacher evaluates (E) their response as to whether it was correct or not, does not lead to a rich discussion or higher-order thinking. Soysal (2021) explained when teachers want and seek out predetermined answers and establish single answers through evaluating and knowledge providing moves, there are fewer opportunities for students to make authentic intellectual contributions to classroom discussions. This IRE format happens all too often in many classrooms, including in science classes. According to Shwartz et al. (2009), science is social and *discussions* are one of the best ways to help students learn and construct understanding. Michaels and O'Connor (2012) wrote about how *accountable talk*, a form of APT, can and should be interwoven into the

science classroom. They noted the use of evidence-based argumentation is important, such as the ability to play with ideas and change them when new evidence is presented.

HOT and APT discussions are also advocated for by the Massachusetts Department of Elementary and Secondary Education. The 2016 *Massachusetts Curriculum Frameworks for Science and Technology/Engineering Grades Pre-Kindergarten to 12* include nine guiding principles underlying all strong science content and instruction. Four of the Massachusetts science principles align directly with the Next Generation Science Standards. These include:

1. Guiding Principle 1 (Relevance): An effective science and technology/engineering program develops students' ability to apply their knowledge and skills to analyze and explain the world around them.
2. Guiding Principle 3 (Rigor): experimentation, design, and analytical problem solving are central to an effective science and technology/engineering program.
3. Guiding Principle 4 (Rigor): An effective science and technology/engineering program provides opportunities for students to collaborate in scientific and technological endeavors and communicate their ideas.
4. Guiding Principle 5 (Rigor): An effective science and technology/engineering program conveys high academic expectations for all students. (National Research Council, 2015, pp. 14–17)

The Next Generation Science Standards shifted science education from learning a series of facts from textbooks to hands-on, inquiry-based learning by students with a big emphasis on APT (National Research Council, 2015).

The Benefits of Academically Productive Talk (APT) and Higher-Order Thinking (HOT)

Many articles and other sources have gone into great detail about the benefits of APT and HOT. Some of those benefits have already been noted. Every research study I reviewed found a positive association between APT and student achievement (Applebee et al., 2003; Aranda et al., 2020; Osborne, 2010; Soysal, 2021; Soysal and Soysal, 2022).

Michaels and O'Connor (2012) summarized the myriad of benefits from APT. Specifically, APT provided a window into student thinking, boosted memory, led to richer associations, supported language development, encouraged deeper reasoning, including reasoning with evidence, and supported students' social development and social skills (Michaels & O'Connor, 2012). Michaels and O'Connor noted some of the unique features to science talk: (a) science discussions are focused on generating community-validated explanations of the natural world, using data and models as evidence or tools in developing ideas; (b) logical reasoning is central to scientific thinking; any credible theory must be concerned about and deal with contradictory evidence. Scientists must be willing to change their minds; (c) although scientists revolve their work in the specifics of their data, the ultimate goal is to generalize and create expanded explanations or theories.

Howell et al. (2011) conducted a research study where they interviewed middle school students about what they liked and did not like about academic talk in the classroom. Howell et al. discussed using accountable talk (AT) in an 8th grade social studies classroom. Howell et al. concluded:

> Findings indicated that students reported a better understanding of the content presented, a strong sense of community in the classroom, and an opportunity to develop an appreciation for the diversity of classmates' backgrounds, experiences, knowledge, and beliefs leading to a deeper, broader look at the social studies content presented. (p. 47)

Perra et al. (2016) authored a chapter in a book on best practices for bilingual learners (MLs). Their chapter on dialogic reasoning (DR), a form of APT, discussed the language development benefits of DR, particularly for MLs. Like Howell et al. (2011) article, Perra et al. noted how APT can also create a community of learners and improve relationships among students.

Connecting APT, HOT, & the Importance of Compelling Questions

Most of the articles and other sources identified in this literature review made a connection between APT and HOT. Articles defined HOT in a variety of ways. Michaels and O'Connor (2012) defined APT as:

> Everyone can hear and understand what is being said, so that every single student is part of the conversation. The conversation is focused, coherent, rigorous, and leads to deep conceptual understanding. Students are motivated to participate and want to go public with their thinking, feeling like they have a stake in the conversation. Conversation is not just for good talkers; everyone has a right and responsibility to contribute. The teacher guides students in practicing new ways of talking, reasoning, and collaborating with one another. (p. 1)

Perra et al., (2016), wrote, "Talk is a key social and cognitive tool that shapes reasoning and meaning making during different literacy practices" (p. 121). The authors use the term "interthinking" (Mercer et al., 2000, as cited in Perra et al., 2016) in regard to dialogic reasoning and HOT development. This same chapter also noted the importance of having a "big question" (Perra et al., 2016, p. 127) to drive the discussion, an important point in a few of the pieces I read and one I included in my research study.

Soysal (2021) conducted a few more recent studies in Turkey on APT and HOT. In their 2021 article, they developed an explanation about the importance of higher-order thinking in the science classroom. They noted such core components of critical thinking as: decision-making, inference, advanced clarification, analysis, evaluation, and explanation (and these are intertwined with scientific inquiry). This study concluded legitimating, challenging, monitoring, and evidencing are required to scaffold HOT. Like Osborne (2010), Soysal noted the importance of questioning, judging, or *arguing* in science discussions. Further, authors have noted argument construction, analysis, and evaluation are fundamental elements of critical thinking (Facione 1990; Golding, 2011; Siegel, 1988, as cited in Soysal, 2021).

Shwartz et al. (2009) explained teachers must pose good questions. Shwartz et al. stated, “Teachers should pose questions that push students to think more deeply about what they have observed, experienced, or read” (p. 45). Students need opportunities to question each other and think aloud with peers as they try to understand phenomena, etc. In this article the authors suggested brainstorming as a good way to make guesses (inquiry) at the start of a unit, from there, students talk with each other to come to a consensus on the cause of the phenomenon through a synthesizing discussion, and sensemaking is where students solidify their guesses and go deeper. They might challenge each other’s guesses with argumentation. Sensemaking may follow an experiment or investigation of some kind.

In Soysal and Soysal’s 2022 study, the authors noted open-ended questions elicited more HOT from students and led to better peer discussions. Like the other study by Soysal (2021), this one suggested the level of the teacher’s questions matters, and cognitively-demanding questions, such as requesting students to comment on others’ propositions yield HOT. In fact, student HOT was dependent on the quality of the teacher's questions. Eliciting questions encouraged the most student intellectual contributions to classroom discourse. When the teacher used peer-led evaluation questions (legitimating) they also got HOT from students. The study also mentioned that part of the legitimating process involved making students’ conceptual inconsistencies public.

Stanley’s (2020) book is all about the creation of higher-order thinking through the development of compelling questions. Compelling questions are open-ended and usually center around a highly charged topic, such as an ethical issue. I drew from this book while working with my science teachers to design questions for small group, classroom discussions and for the pre and post HOT assessments.

Methodology

This pilot study was a mixed-methods, experimental design research pilot study (Creswell & Guetterman, 2019) using a time series design approach. The use of the time series

design prevented any threats to internal validity, such as selection errors, due to my not being able to randomly select student cohorts (science classes) to control or treatment groups. It also prevented threats to external validity, such as interaction of selection and treatment groups, as all students received the treatment. My participants included 23 5th graders and two 6th graders. This pilot study was created with the understanding this was the beginning of our process to study the use of academic productive talk (APT) and higher-order thinking (HOT) skills in our science classrooms.

My hypotheses for this study and included:

- Use of compelling, higher-order thinking questions in middle school science classrooms will lead to *longer* academically productive *discussions* among students.
- Use of an Accountable Talk (AT) protocol with an emphasis on building, stating, and responding to arguments will lead to *longer* APT among students in middle school science classrooms.
- Use of APT and compelling HOT questions in middle school science classrooms will lead to more *HOT utterances* during student discussions.
- Use of HOT questions and an AT protocol over an extended period of time (at least 2 weeks with use almost every time the class meets) will lead to *higher performance* (including more evidence of HOT) on a CER-type assessment of the topic or standard being taught (Posttest).

I also developed three secondary research questions for postintervention interviews with student focus groups and teachers that included:

- In what ways do compelling, HOT questions in the science classroom relate to HOT for middle school students in an urban school environment? (quantitative)
- What do students and teachers think of APT and HOT questions? (Qualitative, second portion of my study)

- In what ways does APT impact a classroom's culture? (Qualitative, second portion of my study)

My independent (treatment) variable was APT (academically productive talk with an emphasis on argumentation). The dependent variable (outcome) was the use of HOT while talking with peers (APT) and use of HOT as students answered a final assessment on the topic (in a claim-evidence-reasoning assessment).

As the treatment (APT, academically productive talk of compelling HOT questions) was used in classes. I observed and recorded two small groups of 5th graders (4 students in one class and 2 in another) and one duo of 6th graders a total of 7 times (3 for 5th and 4 for 6th). I then analyzed student discussions using a HOT Utterances coding tool I made from the Hess Cognitive Rigor Matrix for math and science (2013).

The 5th grade teacher had students discuss the following questions:

- On 4/30/24: Pick the most important paragraph in the reading on the lack of accessible fresh water for all people in the world and explain why. She then had students find and discuss the one sentence in the article that was most important and why.
- On 5/2/24 (two different groups recorded): Decide on 5–6 key problems related to your research project topic on how humans negatively impact the environment. One group focused on light pollution and the other on greenhouse gasses.

The 6th grade teacher had students discuss the following questions:

- On 5/6/24: If we could bring a 1 million old dinosaur back to life, should we and why?
- On 5/9/24: An organism has died next to a river. Describe one way it could become a fossil.

- On 5/10/24 (2 rounds): Looking at a diagram of fossils buried in different layers of earth: Which organism would make a good index fossil and why? (This discussion was run twice using different images.)

As soon as the research study ended, I conducted focus group interviews, with the students I observed, to hear directly from them what they thought of the APT, argumentation, HOT questions. I used open-ended questions from another study (Howell et al., 2011). This allowed me to triangulate my results and understand how my participants experienced the intervention. I also interviewed the two teachers, asking them the same questions. I was curious to learn if the use of AT improved the classroom culture, for example, as other research studies have shown this to be the case (Howell et al., 2011).

I assessed the impact of the intervention by comparing student results on a CER-type question on the topic and standard they had recently discussed against student CER data from earlier in the school year. This was graded using a district-created CER rubric, the same one used to grade student CERs earlier in the year.

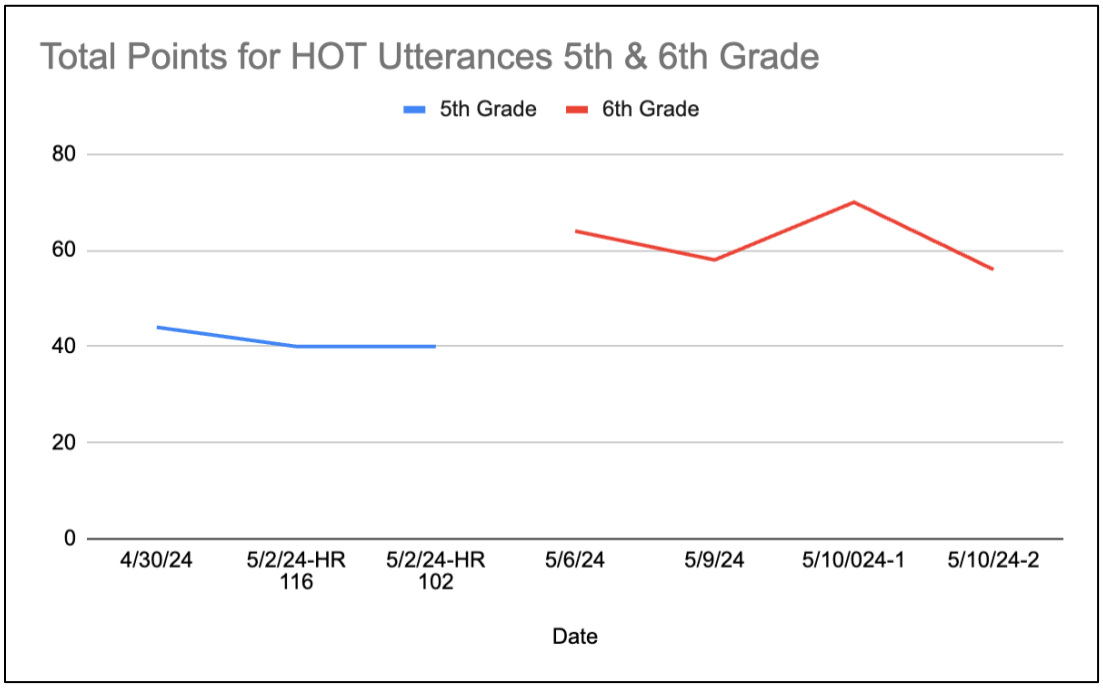
Results

My HOT Utterances Coding Tool consisted of 20 rows for assessing different aspects of HOT during student small-group discussions (see Appendix A). The rows included categories to assess the length of the conversation, the use of the AT protocol sentence stems/frames, changes in thinking when new evidence was introduced, the use of academic language, and several categories specific to the Hess Cognitive Rigor Matrix for Math and Science (2013) such as, “Analyze and draw conclusions from data, citing evidence,” which is considered a Depth of Knowledge (DOK) 3 (Hess, 2013). Each row included a **rating** of 1–3 with 3 indicating the row was achieved/attained by all members of the group and 1 indicating it was done with less than 50% fidelity during the discussion and/or by less than 50% of the students in the group. For example, if students changed their thinking on a topic when new evidence was introduced by a peer, I would rate the row as a 3. Each row was also assessed by its **frequency,** 1–3, with 3

indicating it was observed 100% of the time by all students in the group and 1 indicating it was observed less than 50% of the time and/or by less than 50% of the students. I added the total rating and frequency scores together for each group I observed over the 2 weeks and entered the data into Google Sheets (see Figure 1).

Figure 1

Total HOT Points



I observed a few trends from the data in Figure 1. First, the 5th graders, whom I observed on 4/30 and 5/2, showed slightly *less* HOT in their discussions on the *second* observation (40 total points) than the first (44 total points). It is interesting the 5th grade students found the second question to be slightly more difficult to enter into more HOT conversations. From my observations of the 5th grade students, I concluded that fifth graders had more need of the sentence stems for their second topic. From their statements in the interview, the 5th graders appreciated the stems more than did the 6th graders.

I also observed the 6th graders engaged in more HOT across all observations than the 5th graders with an average score of 62 as compared to 5th grade average of 41.3. Sixth grade scores for each session included: 64 on 5/6, 58 on 5/9, 70 on 5/10-1 and 56 on 5/10-2, all substantially higher than those from the 5th grade. This is not surprising, as I would expect the older students, with 1 more year of experience to show more maturity in their discussions than the younger 5th grade students. Also, because the fifth grade had already developed a project to implement during this time, the teacher in grade five used other materials than those created for this project, and I am not sure how that affected the students' discussions. Although the 6th graders used more higher-order thinking in their discussions, the student scores fluctuated up and down, depending on the students and the ideas they were discussing. This leads me to believe the levels of questions and the discussion topics need to be developed with utmost care.

As part of the quantitative portion of my study, I also compared CER test scores (see Figure 2) from October 2023 and immediately after the AT intervention for the 5th and 6th graders. Their CERs were graded using our public school's Argumentative Writing Student Rubric (see Appendix B) in October and May. The rubric assesses students on the quality of their claim, evidence, and reasoning, and gives them a total aggregate score.

Figure 2 compares the CER sub-categories (claim, evidence, and reasoning) as well as the total scores between October 2023 (preintervention) and May 2024 (postintervention) for the 5th grade. The CER assesses student *argumentation*, which is considered an aspect of HOT. Figure 2 indicates, overall, the 5th graders *improved* in their writing and HOT in two (evidence and reasoning) of the three CER categories and obtained the same score in the third category (claim) between October 2023 and May 2024. The 5th grade students raised their total score by 15%.

Figure 2

Grade 5 CER

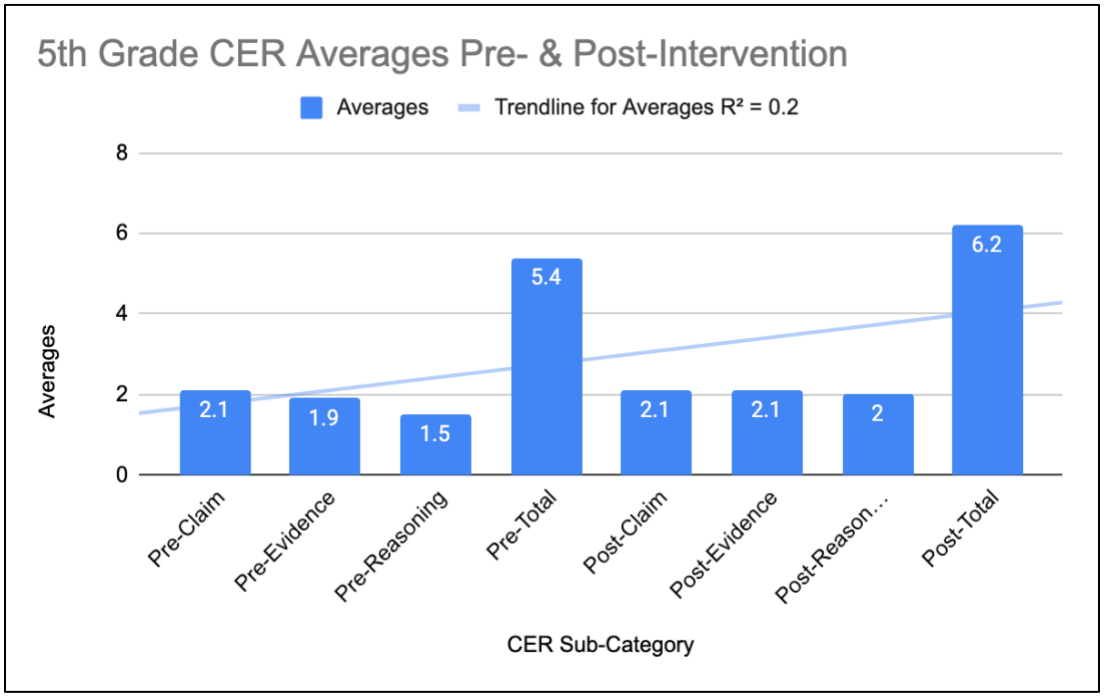
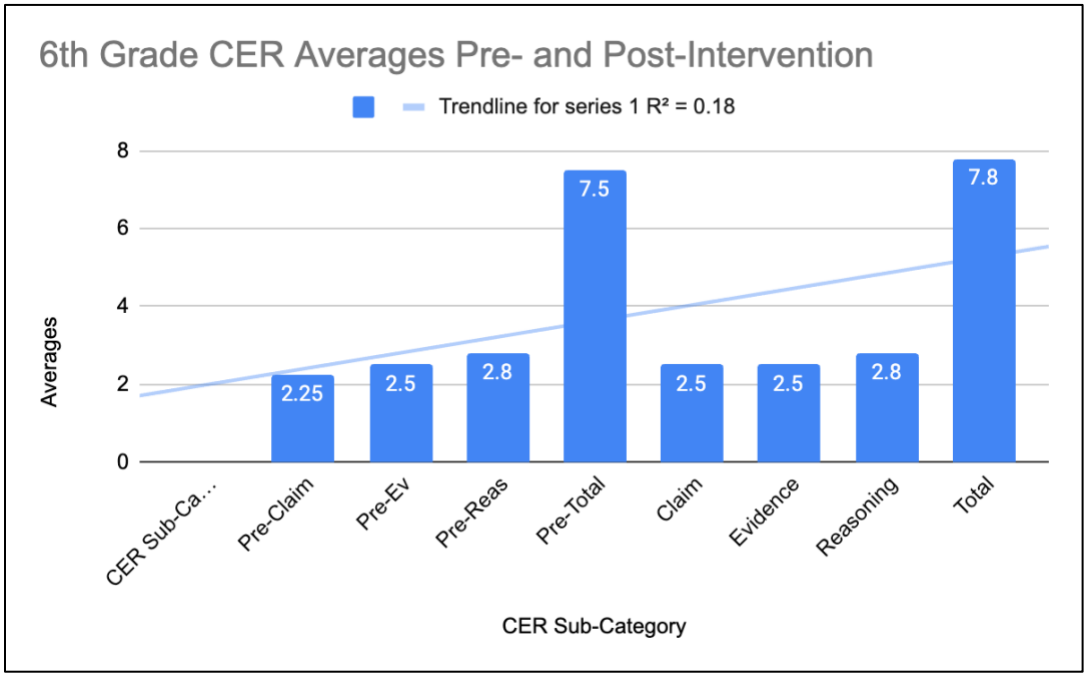


Figure 3 compares the CER sub-categories (claim, evidence, and reasoning) as well as the total scores between October 2023 (preintervention) and May 2024 (postintervention) for the 6th grade (see Appendix B). Like the 5th grade scores, the two 6th graders improved between the fall and spring, but not as dramatically. The 6th graders improved in the quality of their claims slightly, while achieving the same scores for evidence and reasoning. The 6th graders raised their total score by 4%.

Figure 3

Grade 6 CER



Figures 2 and 3 include a regression model trendline created through Google Sheets. The R-squared indicates the proportion of the difference in the dependent variable attributable to the independent variable(s) in a regression model. It measures the goodness of fit to the observed data, indicating how well the model's predictions match the actual data points (Investopedia, n.d.). The trendline goes up for both the 5th and 6th grade.

Qualitative Phase

At the end of the intervention all observed students (5 in 5th and 2 in 6th) and the two teachers were interviewed in regards to their thoughts about using AT in the science classroom. All students received the same questions adapted from Howell et al. (2011). The five prompts were also adapted and given to teachers. The five prompts for students included:

- Accountable Talk helped me understand science better.
- Accountable Talk helped me feel comfortable talking to my peers about science.

- Accountable Talk made me feel responsible for my learning in science.
- Accountable Talk helped me understand how to communicate better.
- Accountable Talk help me create a community in our classroom.

The five prompts given to teachers included:

- Accountable Talk helped my students understand science better.
- Accountable Talk helped my students feel comfortable talking to their peers about science.
- Accountable Talk helped my students take ownership of their learning in science.
- Accountable Talk helped my students understand how to communicate better.
- Accountable Talk helped my students create a community in our classroom.

Among the 5th graders there was wide agreement AT led to more and better discussions in class. In fact, students indicated they wish more of their teachers used the talking stems/sentence frames. One student stated, “We actually talked more than we usually do.” Another student said, “Using a sentence starter helped.” Another added, “It made me comfortable because I knew if I was using the sentence starter and I didn’t know what a claim would be, I could use that.” A final student stated, “We would talk more in our other classes if we used it.”

Students in the 5th grade also all strongly agreed with the statement AT helped them understand how to communicate better. One student said, “I could use the agreement or clarification if [I was] confused, if someone didn't hear or didn’t understand.” Another student described how AT helped create more community in their classroom stating, “It gets people talking to each other and they can become friends or disagree in a respectful way.”

The two 6th graders, on the other hand, did not believe the AT sentence frames/stems had helped in their conversations. One 6th grade student stated, “Talking stems is a way to start a sentence, but it didn’t help.” The second 6th grader added, “It didn’t affect much of my

responsibility, because, I mean, like, it's just an option you can use to start sentences." The two sixth grade students also did not agree AT had improved their classroom community, which they saw as severely lacking. Nor did these students feel AT improved their overall communication skills. However, the two did see the value in student academic talk in general. One student said, "But the talking did help, we could understand each other's perspective when we talked to each other." The second sixth grade student remarked, "We got more intel, you get more information on one subject."

The two teachers both agreed on the theoretical value of the use of AT stems/sentence frames, but were not convinced they had impacted their recent classes very much. They were not sure that this project had enough time to have a full impact on their students. Some of their positive views on AT included: "When a student says something wrong and another student is able to correct them and explain why, the first student will have a better understanding of the material." The other teacher added, "I think it presents them with an opportunity to engage with what they already know and question what they don't, to see if they can get a better handle on the unknown." One teacher also stated, "Yes, the sentence stems gave the other kids something to start with [as opposed to the two I observed in 6th grade]." The second teacher agreed, stating, "Yes, it helps the kids learn better, gives them an opportunity to share and question each other about what they do and don't know. I can hear and adjust my practice too (based on what they share with each other)." Neither teacher thought the use of AT had contributed much to the sense of community in their rooms over the short cycle of use in the late spring. One teacher stated, "No, the sense of community is all within the first month of school and [created] outside the classroom." The second teacher had a similar feeling, "I think if you specifically taught this in the beginning of the year, it would have more of an impact, but starting it in April/May, less so." Finally, one teacher did point out the particular value to ML (multilingual learners) students, which the majority of students in our district are: "Yeah, they had something that showed them what's appropriate to say in the situation. And, a lot of them are former ELLs

and that helps as well." Both teachers indicated wanting to increase how often they use AT in their classrooms and start in earnest at the beginning of next school year.

Discussion

The TNTP (2018) data, that describes the lack of HOT and of rigor in many schools, aligns with my experiences in education over the last 20+ years as a teacher, administrator, and instructional coach. I work at the Cherry (pseudonym) Avenue Middle School (CAMS) in a city in Massachusetts, serving grades 5–8. Our students' MCAS data is among the lowest in the state, putting us at the 2nd percentile for ELA and math. At the same time, our school has some of the highest-need students in the Commonwealth, with 84% low income, 28% MLs, and 18% with disabilities. According to our 2022 district's state report card (Massachusetts Department of Elementary and Secondary Education, n.d.)., the majority of our students are Hispanic or Latino (91%).

A major academic focus for administration in the Cherry Public Schools is on higher-order thinking. Teachers are rated on this during administrator observations using both the Hess Cognitive Rigor Matrix (Hess, 2013) and the SchoolWorks (2022) Classroom Visit Tool. Further, SchoolWorks, an outside agency, Cherry Public School leaders, and our internal team made up of Instructional Leadership Team members, regularly conduct instructional walkthroughs of the building. Unfortunately, the results thus far have been mostly unsatisfactory, with only a very small percentage of classrooms engaging 50% or more of their students in higher-order thinking as defined by Hess and SchoolWorks. I believe our teachers and students need more assistance and training to close the learning gaps for our students. Our teachers work hard for their students, and I believe that ATP and HOT can help our school move forward.

It was clear from the responses of the 5th grade students that they felt APT was very helpful in their discussions. The CER scores for the fifth-grade students were positive, with the students raising their scores in two of the three CER areas (i.e., evidence and reasoning) from the pre to the posttest, while maintaining their score in the claim category. These results are

very promising, especially considering the project took place in the spring of the year, when there were many distractions with end-of-the-year activities. The gains made by the fifth graders were also impressive because they were accomplished in a short period of time. I intend to take what I have learned from this pilot study to expand my focus to more teachers in the building and to include my findings in future professional development sessions. This could allow me to engage in a full-length study of the school.

As noted, the 6th graders engaged in more HOT on all observations than the 5th graders. It could be in part due to the differences between prompts, and it is also likely due to the fact the 6th grade students are older and more experienced students. The two 6th graders I observed appeared to be academic leaders in the classroom. This is probably why neither of them needed nor saw much value in using the AT sentence frames (see Appendix C). From my observations, it is clear that different kinds of students need more specific ways to encounter the curriculum and the accompanying discussions. This is an important observation as I move from this pilot study to a full-length study for our school.

Limitations

There were five limitations to my study: (a) length of the study; (b) size of the participant pool; (c) lack of sufficient training for teachers or students, (d) timing of the study, and (e) inconsistencies in the assessment tool used in the study. The gains made in this pilot study were accomplished in spite of these major limitations for the study. With these limitations, I am excited to take the data and learning experiences to develop a full study for the coming school year.

First, this pilot study occurred over a two-week period. The students made gains in their HOT skills in a very short period of time. I did not have the time needed to help teachers learn how to create and implement multiple kinds of HOT questions. This also meant that students were not well prepared to employ ATP discussion techniques in their work. There was no time for teachers or students to learn and practice the skills required for effective ATP and HOT

implementation. The lack of time also meant that I could not accomplish pre and poststudy observations of the teachers nor the students.

Second, my sample size was very small. There were six grade five students and two grade six students. I observed the students in three groups: one grade five group of two students, one grade five group of four students, and one grade six group of two students. Although, I developed some interesting data, the utility of the data is limited. Since this was a pilot study, I did gather some important ideas to use in the full study. I will work to ensure the participant pool is larger and more diverse in the full study. Since the student body in our school is diverse, this will be very important for me to accomplish.

Third, since the time span to create and implement this pilot study was limited, I was not able to create effective training for the teachers and the students. In order to gather more meaningful data, it will be important to make sure that teachers understand and have gained the skills necessary to create higher order thinking questions for their students. Teachers should also be trained to help their students learn how to apply ATP discussions in their work. Both teachers and students should be given time to practice so their discussions can be more productive, especially in terms of HOT skills. It is also important for teachers and students to gain a full understanding of the ATP process and practice using it regularly in their classroom.

Fourth, the timing of this pilot study was limiting in various ways. This study was implemented during the spring term of the school year. End-of-the year activities and preparations caused conflicts in time and the ability to work with students and teachers. Spring assessments also caused time conflicts in implementing this study. In the fifth-grade team, the teachers had created and were implementing a grade five project. That meant the fifth-grade teacher had to use the process and questions their team had already developed. Though the students were engaged in discussions for their project, the prompts given to the students were not created to specifically be HOT questions. During this time period, students tend to lose some of their concentration on school work. The end-of-the-year processes usually make

teaching and learning become more complicated. In spite of those limitations, the grade five and grade six student participants raised their scores during the study. That result is very promising.

Fifth, due to the time constraints, I was not able to validate the observation tool used in this study. In the full study, I will make sure the tools used are valid and reliable. The CER assessments were scored by one group of teachers in the fall, and I assessed the CER in the spring for my participants. Thus, even though the same tool was used to score students, there could have been inconsistencies with different observational abilities and training between other teachers and my abilities and training. Thus, the scores cannot not be considered to be as valid in this pilot study.

In spite of the limitations of this pilot study, I am encouraged by the fact that all three groups of students made progress. That is an encouraging sign for the future and a full study, free from the current limitations. In the interviews students and teachers were encouraging me to continue to study these ideas and practices for ATP and HOT.

Future Research

While the results from this small pilot study were limited and not robust, I saw, and the students and teachers indicated the value of AT in the classroom. Further, students now clearly see the value of AT, APT, and AT sentence stems/frames, and some students are asking for them to be used more often by their teachers. The data from the study also demonstrated to me that the quality of the questions being asked by the teacher matter. This is an area our school addressed in our Annual Improvement Plan for the 2024–2025 school year, as it has also been seen by outside observers during Instructional Rounds. APT, when paired with compelling questions, can be very powerful, and I believe APT concepts should be explicitly taught to students at the start of the school year. My review of the data from students in this pilot study, along with the teacher interviews indicated connections between AT, ATP, and HOT. I have concluded it is critical all students develop HOT skills so they can succeed in any schooling or career in the future and become deep thinkers and engaged citizens.

These conclusions have led me to four recommendations for research in our school. My first recommendation is to develop AT stems for our sciences classes and gather data from teachers and students as to their effectiveness. Then, from that data our teachers could refine their AT stems to make sure they are more effective for our students. As we implement the stems with students, it will be important to gather data to assess which AT stems are most effective for our students. This is especially important for our fifth-grade students, who found the AT stems to be very helpful. I also recommend that we work to develop more complex stems for grade six students, who are more mature and experienced than their younger peers.

The second recommendation for our school is to participate in professional development in creating compelling questions for students to utilize in their APT activities. In this process, it seems likely to me that teachers will need multiple levels of compelling questions, since our students are diverse as learners. During such professional development sessions, teachers could develop compelling questions for their most important assignments and projects. Then it will be important to gather data to assess the compelling questions in order to know whether or not we will need to make adjustments for some questions.

My third recommendation is that future research on AT and HOT should involve a much larger sample size over an extended period of time in the school year. I am encouraged because our school is moving in the direction of developing APT and HOT and excited to continue this process. It will be important to develop research during this process that employs a large group of students. The results from the pilot study are encouraging, and it will be important to gather enough data to allow us to make more certain recommendations for our teachers and students.

My fourth recommendation is to develop research in relation our professional development activities. Any school will only make progress if teachers are properly trained and supported, the only way to understand how well professional development and support for teachers are working is to gather appropriate data to give our school the ability to assess our

progress. I believe our school has the appropriate elements in place to accomplish the development of a valid research process. If our process is successful, then we would be able to share our results with other schools.

Final Thoughts

I am excited about the direction our school is taking in relation to AT, APT, and HOT. Our teachers are dedicated, and, if supported appropriately, will accept the challenges of closing the academic gaps for our students. These concepts have been shown to work elsewhere, and I am confident that we can develop similar results. Maybe even more important for me, if we are successful in this process, we will give our students skills that will help wherever they go after high school. We have the opportunity to help our students to actually be prepared for college and the world of work in their future lives. Our students will have gained the HOT skills and communication skills to be successful in their future endeavors. I believe this work will lead our students to become life-long learners and caring and positive citizens.

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Appendix A

Coding Tool for AT & HOT Utterances During APT Small-Group Discussions

Anticipated group size = 3–4 students *Anticipated discussion length = 5–15 minutes*

Date _____ Classroom Number _____ Student ID #s _____

Accountability to Discourse & Group

Indicator	Rating (1-3) *	Frequency (1-3) **	Notes
Everyone speaks and articulates loudly and clearly enough for all group members to hear and understand what is being said			
Students ask each other *clarifying questions* if they misunderstand or mishear a peer			
Everyone participates at least once during the discussion			
Students use AT sentence frames to *state* ideas/claims/opinions			
Students use AT sentence frames to *respond to* peer Ideas, claims, opinions (elaborate, provide contradictory information, etc.)			
Students use AT sentence frames to *ask* peers questions (beyond clarification)			
Students shift/change thinking, opinion, claim when new or *contradictory evidence* is presented by a peer			
Students use *academic language* specific to the topic			
Students *remain on-topic* (APT) the entire length of the time set by the teacher			
Discussion lasts *entire* length of time set by teacher (usually 5-15 minutes max)			

Hot Utterances

Indicator	Rating (1-3) *	Frequency (1-3) **	Notes
DOK 3/Understand Explain, present, generalize, or connect ideas *using supporting evidence* (Make a claim with *supporting evidence*)			
DOK 3/Analyze Analyze and draw *conclusions* from data, citing *evidence* (inference-making)			
DOK 3/Evaluate Evaluate validity and relevance of *evidence* used to develop an argument or support a perspective			
DOK 3/Evaluate Verify or critique the accuracy, logic, and reasonableness of stated conclusions or assumptions			
Include *reasoning* (the why) behind a claim and evidence			
DOK 3/Apply Apply a concept being discussed to a new context (transfer knowledge)			
DOK 3/Analyze Analyze or interpret *interrelationships* among concepts, issues, and/or problems (inference-making)			
DOK 3/Analyze *Compare* or *contrast* information within or across data sets or texts (or an idea proposed by a peer)			
DOK 3/Analyze Use *reasoning* and *evidence* to generate criteria for making and supporting an argument of judgment			
DOK 3/Create Develop an alternative solution or perspective to one proposed (e.g., debate)			

Scoring Rubric

*Rating Scale
3 = done with 100% fidelity by all students in the group 2 = done with 50% fidelity and/or by 50% of students in the group 1 = done with less than 50% fidelity and/or by less than 50% of the group
**Frequency
3 = observed 100% of the time by all students in the group within a 5-10-minute interval 2 = observed 50% of the time and/or by 50% of the students within a 5-10-minute interval 1 = observed less than 50% of the time and/or by less than 50% of the students within a 5-10-minute interval

Appendix B

Argumentative Writing Student Rubric

	Meets Expectations (3)	**Approaching** (2)	**Emerging** (1)*
Claim	Restates and answers the research question Accurate conclusion based on data collected or presented Complete sentence	Correctly answers the research question Accurate conclusion based on data collected or presented Phrase or complete sentence	Restates the Research question with misinformation or Answers the research question correctly with one or two words (e.g. "*Yes*." or "*Kinetic energy*.")
Evidence	Lab results and data are described thoroughly in bullet points or complete sentences. Data are sufficient, relevant, and support the claim. Refers to appropriate figures, graphs, texts, etc. to describe both qualitative and quantitative data, with appropriate units for quantitative data	Lab results and data are described in bullet points, phrases, or complete sentences. Data are relevant and support the claim. Includes qualitative and/or quantitative data	Lab results and data are included. Some data are relevant and support the claim.
Reasoning	Reasons are explained in an effective way that compels the reader to accept the claim, including *how* and *why* the data supports and defends the claim. Relevant scientific principles, facts, theories, phenomena, or concepts are described extensively, and key scientific vocabulary terms are included and used correctly. Uses suitable words such as conjunctions to connect sentences in a logical sequence.	The evidence is explained in phrases or complete sentences. Some science and key vocabulary terms are included and used correctly.	The evidence is restated. Some science and key vocabulary terms are included.

Appendix C

Accountable Talk Sentence Stems/Frames

Grade 5

ACCOUNTABLE TALK

Agreement	Disagreement
I agree with what ___ said because… I agree with ____, but I would add….	I disagree with what ____ said because… I am not sure I agree with what ____ said because…
Clarification	**Confirmation**
Could you please repeat that for me? I am not sure I understood when you said ____, could you say more about that?	I believe… I think… I found further evidence of what you said about…
Confusion	**Extension**
I don't understand… I am confused about… I am not clear on…	I was thinking about what you said and I was wondering what if… This makes me think…. I want to know more about…

Grade 6