AN EXPLORATION OF THE USE OF TECHNOLOGY TO ADDRESS ACADEMIC LANGUAGE LEARNING IN TEACHER EDUCATION IN PREPARATION FOR THE EDTPA

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ABSTRACT
This qualitative exploratory research examined the processes student-teachers used to address academic language in lessons generated for middle school instruction. Undergraduate student-teachers were provided access to ReadAhead, a technological platform designed to scaffold students' content literacy skills. The student-teachers were serving year-long internships in four content areas and preparing to complete their edTPA teacher certification portfolios. They planned and implemented lessons within diverse middle school settings. They were subsequently interviewed concerning their thought processes in creating and implementing the lessons, and a document analysis was conducted. The findings indicated that the student-teachers approached the lessons with different purposes in mind, and those divergent purposes influenced other critical aspects of the lessons. They also showed a lack of metacognitive awareness concerning the integration of academic language, though they unconsciously addressed it in ways consistent with the literature and the edTPA's expectations. Ultimately, academic language instruction is essential to learning in all content areas, yet the definitions and application of it may still be unclear to aspiring educators in teacher preparation programs. Considering that the incorporation of academic language instruction will be vital to the licensure process and subsequent practice, it becomes imperative that teacher education programs methodically address the issue.
Keywords: academic language, teacher preparation, content literacy, vocabulary, technology, edTPA

Foundations of Academic Language and its New Prevalence in Teacher Training

Academic language has become more of a focus in recent years in the field of education. This is likely in part due to the increasing emphasis on Schema Theory, which asserts that knowledge is organized in the brain in sophisticated, interrelated structures, with all knowledge about a given topic being interconnected in a web-like fashion (Kozminsky & Kozminsky, 2001; Merriam, Caffarella, & Baumgartner, 2007; Tracey & Morrow, 2006). Schema Theory is related to background knowledge, which has been shown to consistently predict and correlate with increased text comprehension, (Dinnel & Glover, 1985; Guthrie, et al., 2006; Kozminsky & Kozminsky, 2001; Snapp & Glover, 1990; Tracey & Morrow, 2006), and text comprehension is essential to learning in all subject areas. The heightened interest in academic language may also be partially attributable to the other dominant theory in education, Vygotsky's sociocultural learning (1986), which stresses the use of language processes as fundamental to all human learning. As colleges of education have emphasized sociocultural learning, activating schema, and building background knowledge with student-teaching candidates and graduate level teachers in order to increase student learning in K-12 classrooms, another entity arose that further propelled the prominence of academic language in teacher training and, in turn, public education- the edTPA or Teacher Performance Assessment.

The edTPA is a product of the Pearson Corporation that was developed by the American Association of Colleges for Teacher Education in conjunction with the Stanford Center for Assessment, Learning, and Equity (SCALE) to assess teacher pedagogical readiness and pedagogical content-knowledge in 27 different content areas (Hildebrandt & Swanson, 2014). It is partially derived from a Constructivist approach which again can be traced back to Schema Theory as hypothesized by Piaget. As of this writing, institutions in 35 states and the District of Columbia are using the edTPA to assess teacher preparation (AACTE, 2016). The authors of one of the first studies conducted on the edTPA since its widespread implementation, Hildebrandt and Swanson (2014) have noted that empirical research is lacking on the edTPA and its impact on teacher preparation programs, teacher outcomes, and student outcomes. While teacher effectiveness is notoriously difficult to gauge, the purpose of the edTPA is to identify beneficial teaching practices and allow teaching interns to demonstrate that they can employ practices and processes that successfully impact student learning. Several criticisms of edTPA have emerged: little is known about how it compares to existing measures of teacher effectiveness and student achievement; corporate encroachment on education and restrictions to academic freedom due to the Pearson Corporation's heavy involvement; and a lack of empirical data supporting its use.

Because most teachers have not been provided with adequate professional learning for addressing academic language in instruction (Gebhard & Willett, 2008), it becomes essential that teacher-education programs implement professional development in the area to better prepare new teachers. By including academic language as a main focus of the edTPA, its creators have ensured that student-teachers concentrate on how to use academic language to scaffold students' learning. But while there appears to be some consensus on how significant the development of academic language is in enhancing students' content knowledge, there are a variety of frameworks for academic language and views on what constitutes it. Due to this ambiguity, many new teachers may lack an understanding of how to incorporate it into their instruction. The purpose of this research was to explore student-teachers' understanding and use of academic language as they used a technological platform designed to focus on academic language in their lesson plans.

Conceptual Frameworks for Academic Language

Regardless of the state of research supporting the edTPA, it is clear that its designers envisioned academic language to be a significant component of the expectations for teaching candidates in their planning and implementation of lessons for the assessment. It thus becomes essential to examine what academic language actually is and how it applies to learning in the classroom. Zwiers (2004), who is cited in edTPA literature, argues that academic language binds tasks, texts, and assessments together and is comprised of words and phrases that "describe content-area knowledge and procedures, express complex thinking processes and abstract concepts, and create cohesion and clarity" in discourse (p. 60). The foundation for academic language instruction combines concepts from language acquisition theory, academic language development, and Constructivist learning models. One essential aspect is to help students interpret meaning via context so that they learn to make concrete-abstract connections and change the concrete meaning of terms in abstract meanings that fit the context of the passage.

Baumann and Graves (2010) examined academic language in its broader context, not in relation to the edTPA. They noted that academic language has also been described in the literature by the following terms: general academic vocabulary, academic literacy, academic background, general academic words, domain knowledge, linguistic knowledge, domain-specific vocabulary, content vocabulary, and academic language skills. They point out that academic language does not necessarily deal with specific content areas or disciplines yet admit that some researchers have classified academic language under the broader category of academic domain knowledge, arguing that domains have their own lexicon and vocabulary. One concern Baumann and Graves introduce is that authors of textbooks and teachers often make the assumption that students know the meanings of general academic vocabulary and only focus on domain-specific vocabulary. Recent models for classifying academic vocabulary have tended to focus on the frequency to which they appear (Fisher & Frey, 2008; Hiebert & Lubliner, 2008), how specialized or technical the terms are (Fisher & Frey, 2008; Harmon, Wood, & Hendrick, 2008; Hiebert & Lubliner, 2008), and how general or widely dispersed terms are across academic disciplines (Fisher & Frey, 2008; Harmon, Wood, & Hendrick, 2008; Hiebert & Lubliner, 2008). The technical or specialized words tend to be important but low frequency while the general terms tend to be found in higher frequency and allow for greater understanding of the more technical terminology.

The study of academic language has more often been associated with ELLs with less research on the subject having been devoted to native speakers (Baumann, & Graves, 2010). Some may question why a concept that has become so prevalent in general education and in teacher training in all areas is predicated upon research stemming from instruction devoted to English language learners. Yet classrooms are increasingly diverse, in many ways, particularly linguistically, culturally, and economically (Gebhard & Willett, 2008), so this development can be seen as a more inclusive approach to education. Indeed, Zwiers (2004) contends that academic language can be viewed as a 3rd language for ELLs or a 2nd one for native speakers. Terms that might be familiar to teachers and some students might be new to others, especially ESL students (Burke, 2004). Those who are familiar with them may take their meanings and the need to teach them for granted, but those who are unfamiliar will lack comprehension of the text when they encounter them. Terms like "argue," "compare," "evaluate," and "claim" have specific academic meanings that students will not necessarily understand intuitively so they must be taught.

Tiered Hierarchical Language Learning and Higher Order Thinking

One useful and well established framework for conceptualizing academic language is Beck, McKeown, and Kucan's (2002) three tier hierarchical model. The first tier is comprised of the most common language used in everyday speech and writing and includes terminology that is prevalent in all subject areas. The second and third tiers can be classified as academic vocabulary, with the second tier being general academic vocabulary and the third being domain specific-vocabulary (Baumann & Graves, 2010; Zwiers, 2007). Tier 2 general academic vocabulary, such as "analysis" or "process", applies across content areas. These terms are used frequently in science, math, and language arts, for instance, but are used less often in everyday discourse so it is important for students to understand them in order to comprehend a wide range of academic information. The term

"metalanguage" might be applicable in many cases to this Tier 2 vocabulary which often refers to a conscious application of cognition or specific language demands. On the other hand, Tier 3 domain-specific vocabulary applies only to certain disciplines, such as "cosine" or "electron", and knowledge of these terms is necessary to allow for deep understanding in specific fields.

Baumann, and Graves (2010) argue that when choosing terms to focus on with students, it is important to consider both Tier 3 *and* Tier 2 words and to have a strong knowledge of students' understanding, including where they might have gaps in their vocabulary in relation to the terms in the text. Teachers most often focus on Tier 3 domain-specific terms, but without an understanding of Tier 2 words, students will have difficulty in applying the Tier 3 content terms that are relatively unique to the various subject areas. Thus, teachers must anticipate not only the Tier 3 words that are essential to the lesson but also the Tier 2 words that act to bridge the Tier 3 words together (Baumann & Graves, 2010; Zwiers, 2007). Both types of terms should be addressed before and during reading and then ideally in speech. If not, students will likely skip the information they cannot comprehend and move on to the information they do, and this will cause gaps in their understanding of the material. Two ways that researchers have suggested that teachers can help students understand how those Tier 2 terms can be used to classify and make sense of the Tier 3 words are through organizers and chunking.

When confronting written text, it is important for both the teacher and student to concentrate on Tier 2 metalanguage that describes thinking skills and higher order processes such as comparing, analyzing, evaluating, synthesizing, and persuading (Zwiers, 2004). Students will generally be exposed to more specific content area language during reading that they will in oral conversation. Then, once they have achieved some mastery of the concepts, students must use this new academic language in formats in which they are required to generate ideas and negotiate meanings for themselves such as in writing and oral discourse, as opposed to only reading or listening. This use of new language to generate ideas brings learning from traditional models based on passive learning in which students receive information to the more active higher order processes of sociocultural learning proposed by Vygotsky (1986).

In one of a limited number of recent empirical studies on academic language, Zwiers (2007) argues that academic language is a dialect that communicates cognitive processes, complex relationships, and abstract concepts. His research focused on the instruction of four 7th grade middle school students who were intermediate English learners who had been in the U.S. for a number of years but whose native language was not English. In contrast to the common three-tier Beck, et al. (2002) framework, Zwiers (2007) found that most language in his observations could be classified into five more sophisticated categories: identifying cause & effect, comparing, persuading, interpretation, and taking others' perspectives. Teachers facilitated thinking in these domains in all four subject areas. However, comparing was more commonly used in history and science, while interpretation was the most common in language arts. Teachers tended to move from closed-ended, fact-based concrete questions at the beginning of lessons to open-ended, higher order, abstract questions deeper into the lessons. The teachers often introduced new terms by linking them to personal experience or background knowledge via examples, analogies, or personifying (asking students to view things through the perspective of whatever they were focusing on). In this way, they promoted learning by activating and building schema. The greatest increases students showed in their discourse were in the areas of comparing and cause and effect. However, a negative pattern emerged that Zwiers called *linguistic enabling* in which teachers allowed students to produce non-academic responses. The teachers also tended to prompt ELL students more with fact-based, closed-ended, lower order questions than they did mainstream students and did not ask for as much elaboration from them, likely in an attempt to protect them from discomfort. Ultimately, teachers must be aware of cognitive skills and the language that accompanies them, and specific training in the use of academic language may be valuable.

Contextual Real-World Learning, Authentic Instruction, and Acquisition

Students will, of course, expand their broader vocabulary through day-to-day communication while being exposed to new terminologies via mediums such as social media. However, educators must actively teach academic vocabulary, which goes beyond terms and encompasses linguistic processes and patterns associated with the content (Wilhelm, 2007). One obvious way to expose students to vocabulary that they might not regularly encounter in their daily lives is to engage them in content area reading. A wide variety of research with students of varying ages has shown a strong relationship between academic vocabulary and comprehension of content (Alfassi, 2004; Beck, Perfetti, & McKeown, 1982; Connor, Morrison, & Petrella, 2004; Joshi, 2005; Ouellette; 2006). While improving vocabulary appears to be crucial to improving comprehension, it is also important to note that language is best learned within meaningful contexts, as opposed to in isolation (Leone et al., 2005; Nelson & Stage, 2007; Wilhelm, 2007).

In order to provide those contextual elements, teachers could create assignments with specific situations that would require the disciplinary language and problem solving that students would encounter in real-world environments through inquiry and connecting the topics to current issues (Wilhelm, 2007). If students are not using the language that experts in the field use, then it is debatable whether they are actually gaining a deep understanding of that subject matter. In order to achieve real learning, a student's thinking should increasingly

approximate that of experts in that field, and the specific language of that field is a reflection of such thinking. Academic language creates a foundation for subsequent forms of discourse appropriate for various fields in the workplace (Zwiers, 2007). Yet listening and/or reading are not enough. Students need opportunities to generate ideas using this new language via talking, writing, reflecting, and creating, both formally and informally (Wilhelm, 2007). Ways of using language may include defining, classifying, analyzing data sets, identifying relationships, or using scientific data to build an argument. Language functions are best learned when applied to specific, purposeful tasks such as these.

Teachers must have students read, write, and discuss academic content using technical language of the field because that language is likely to differ significantly from the language students use in everyday environments (Gebhard & Willett, 2008). Students need to build awareness and metacognition about this type of language, so the discourse must be purposeful and should be a conscious endeavor. Other types of instructional activities that can meet these goals are projects with authentic purpose, a focus on appropriate academic genres for acquiring academic language as well as analysis of those genres and specific language demands, multiple models for explicit instruction, materials that support genre-specific vocabulary building, and tasks that provide opportunities for students to collaborate and reflect. Yet it remains a common misconception that innovative projects cannot conform to standards or that if teachers closely follow standards they cannot incorporate innovative assignments. Because academic language and higher-order thinking skills are so closely linked (Zwiers, 2007), those projects that develop the academic language related to the standards and curriculum should naturally involve students in active, higher-order thinking.

Despite the call for authentic learning activities and language learning in context, there is some evidence that academic language should also be taught in isolation in order to increase students' exposure to it and their metacognitive awareness of it. Acquiring new language and vocabulary is at least partially dependent on the number of times the learner is exposed to the terms and the way those terms are processed (Laufer & Rozovski-Roitblat, 2011). Studies have shown that students can learn new vocabulary from both being exposed to vocabulary incidentally and from focusing on it in isolation. Thus, some researchers have concluded that specific instruction is necessary because it may be unlikely that students are exposed to any term enough times through reading alone to retain its meaning. In a well designed experiment, Laufer and Rozovski-Roitblat found that students learned vocabulary better when they read it in context and the instructor used the context to reexamine the terms than if the students simply read the information without reexamining the terms. However, they learned the terms even better if they studied them through decontexualized practice such as vocabulary exercises or word activities where word learning was the object of the instruction. In either case, when students' consciously focused on word learning, as opposed to purely incidentally encountering them in reading, they retained much more information after only small increases in exposure. In order to directly address academic language learning through increased exposure, Burke (2004) recommends scaffolded instruction, multiple modes of application, graphic organizers, models (examples), generative thinking (using the terminology), clearly structured assignments (in stages), and collaborative exercises.

However, most teachers have not taken part in ample professional learning experiences to prepare them to fully support students' development of academic language, particularly with diverse populations (Gebhard & Willett, 2008). They need professional development in order to become proficient at facilitating student learning of both content and academic language. It is likely that the edTPA certification instrument places a heavy emphasis on academic language for this very reason- to ensure that teachers become adept at focusing on scaffolding students' learning of academic language which in turn should facilitate greater learning in the various content areas.

Ultimately, there seems to be broad agreement on the importance of academic language in learning across the content areas. Yet there are a variety of frameworks, definitions, and perspectives on what constitutes academic language and how it should be taught. This somewhat ill-defined problem can confuse new teachers as to how they should approach instruction in regard to academic language, and out of frustration for lack of a clear understanding of how to incorporate it into instruction they may revert to the age-old method of simply having their students list terms and memorize their definitions. Thus, it becomes essential to explore more nuanced and effective ways to conceptualize academic language and integrate it into lessons so students may use it as a foundation for more extensive learning.

Current Study

This study was designed as exploratory research to examine how undergraduate teaching candidates used and conceptualized academic language when planning and implementing lessons in public middle schools during their field placement internships. They were supplied with a previously validated technological platform that allowed them to present reading passages to students and highlight academic language they deemed appropriate. The teaching candidates were given no direction concerning how to formulate their instruction aside from technology navigation directions, so the creative process they used was of interest. All of the teaching candidates were in the process of completing a mock edTPA portfolio in preparation for undertaking the official

edTPA portfolio within the next several months, so it was expected that the use of academic language would be central to their lesson planning, and the technological platform provided them with a way to narrow their focus on that language. There is very limited previous empirical research on the use of academic language in professional development settings, particularly in regard to the high stakes edTPA, so with this case study we sought to examine the processes associated with how new teachers use academic language and determine what new lines of inquiry may advance future research.

Method
Contextual Factors

The study took place at a large state university of approximately 17,000 students located in the southeastern United States. Ten undergraduate student-teachers volunteered to participate in the research. All were seniors between 21 and 25 years of age, and all were enrolled in an upper level strategies and monitoring course in the college of education designed to engage student-teachers in research-based practices and assessment. Each of them had previously taken and passed a content literacy course that provided them with instruction on how to address reading, vocabulary, and writing development in their specific content areas. The ten student-teachers were in the process of serving year-long internships in local middle schools where they were placed four days per week and were expected to take responsibility for planning and implementing instruction during that time. The middle schools where they served their internships ranged from rural to suburban to urban settings, some of which were composed of mostly White middle school students while others were composed of more diverse populations with English language learners who spoke a variety of foreign languages. The middle schools were located in areas that would be considered as falling into the middle class, lower middle class, and working class ranges of SES. The study took place during the fall of the student-teachers' senior year when they completed a mock edTPA for practice prior to being among the first wave of student-teachers in the state to officially complete the edTPA portfolio during the spring semester of 2016 when they were placed in their internships for 40+ hours each week.

Materials and Measures

Technological platform. Cognitive tools are defined by a number of functions: They are instruments or techniques that enhance cognition, guide cognitive processes, extend intelligence, assist learners in accomplishing complex cognitive tasks, act as intellectual partners with the user, engage the learner, or facilitate critical thinking and higher-order learning (Liu & Bera, 2005). Such cognitive tools act as scaffolding mechanisms. For the purpose of this study, the ReadAhead program, a recently developed technological platform, was chosen as the cognitive tool. An incarnation of the ReadAhead program was previously validated and shown to be effective in scaffolding student learning in two experimental studies (Cuevas, Irving, & Russell, 2014; Cuevas, Russell, & Irving, 2012). A third study illustrated how design decisions were made to optimize the program for classroom instruction in the face of common classroom technology integration constraints (Russell & Cuevas, 2014).

The ReadAhead program allows teachers to choose a passage or text that they would like their students to read. The teacher then cut-and-pastes that selection into the ReadAhead program. The teacher is able to determine how the passage is chunked, or in other words, control how much text is visible to students at any time. Then the teacher has three options for highlighting academic language in the passage: 1) All of the state standards for every grade level and every academic subject area are linked in the program. The teacher can choose this option, and the program will highlight any terms that appear in the passage that are also mentioned anywhere in the state standards for their content area and grade level. 2) The teacher can scroll through the passage and manually choose the academic language to highlight by simply clicking on the terms. 3) The teacher can choose a mixture of the first two options and combine academic language from the state standards with terms identified through their personal judgment.

When students subsequently read the passage, they sit individually at computers or with tablets and view the presentation that the teacher has created for them. Prior to each chunk of text that is presented on the screen, the various terms that the teacher has chosen to focus on flash briefly on the screen, one by one, until the entire chunked passage becomes visible. These "probe words" have the purpose of encouraging students to make predictions about the upcoming chunk of passage, activating schema, and allowing teachers to draw students' attention to important or interesting aspects of the passage. Once the probe words have flashed across the screen, the chunked passage appears with the probe words bolded within it. The students read the chunked passage and then move on by clicking through another set of probe words and another passage, repeating the process until they have read through the entire selection, which may be any length but is most often the equivalent of 3-5 pages or the amount of reading students can be expected to read independently in approximately half a class period. Below in Figures 1 and 2 there is a graphic depicting a probe word displayed and another depicting a chunked passage with the probe words bolded.

Interview procedures. Data were collected in part via two semi-structured group interviews, each lasting approximately our hour. Two student-teachers sat for the first interview, and three student-teachers sat for the second. Four were females and one was male. Of those five student-teachers, one was doing her internship in a middle school math classroom, two were doing theirs in science, and two in language arts. There were several broad topics that were covered, and the student-teachers were encouraged to elaborate. They were prompted with unscripted follow-up and probing questions. The broad topics included the following: how the student-teachers chose the terms they decided to highlight for their students; their purpose in how they approached the lesson; to what extent they considered schema activation, background knowledge, and culture when building the lesson; whether they focused more extensively on Tier 2 or Tier 3 terms; how or if they extended the lesson so that their students would use the terms themselves; whether they planned to remediate or assess students' understanding of the academic language; how their students responded to the task; and how they viewed the process in terms of their edTPA preparation.

Document analysis. Also of interest was whether the student-teachers accurately identified the level of academic language they chose for their students to focus on. In order to analyze this information, we generated lists of the terms that the student-teachers highlighted in their lessons. Then undergraduate students in teacher education who were enrolled in a content literacy course were trained to categorize academic language according to the three tier framework proposed by Beck, McKeown, and Kucan (2002). These student-raters were placed in groups of five by content area and were given a list of terms that corresponded with their content area. For instance, five math education majors were provided with the list of terms one student-teacher had compiled from the passage she used for her math lesson. The student-raters were asked to examine each word as a group and come to a consensus on which tier each term fell into. The criteria they used was that Tier 1 terms were common words that students would be likely to encounter in everyday life, Tier 2 terms were words that students would be most likely to encounter in an academic setting but across a range of different content areas, and Tier 3 terms were words that were specialized terms that were likely only to be encountered within a specific content area.

Procedures

Undergraduate student-teachers were recruited from a senior-level strategies and monitoring course during the fall semester of their senior year while they were also completing the first portion of their year-long internship in public schools. Several of the assignments in the course required them to plan out lessons using a lesson plan template that corresponded with the edTPA portfolio. The lessons were required to include research-based strategies that the student-teachers identified through their coursework. The student-teachers searched the university's research database to locate empirical studies that tested learning strategies, and then they built lessons around strategies that were shown to be successful. They were then required to actually implement those lessons in their public school setting with middle grades students and provide evidence that they had taught the lessons in the form of assessment documentation.

One of these assignments required the student-teachers to incorporate technology into the lesson in addition to a research-based strategy. They were offered the use of the ReadAhead program for this assignment because it meets both criteria, as it incorporates technology into the instruction and has been empirically tested and shown to be a successful instructional method (Cuevas, Irving, & Russell, 2014; Cuevas, Russell, & Irving, 2012). Ten student-teachers chose to use the ReadAhead platform in their lessons. They created the lessons themselves based on the edTPA lesson plan template in use by the department, implemented the lessons in their respective schools, collected assessment data on students' learning, and turned the assignment in for a course grade. The ReadAhead presentations the student-teachers used in those lessons became a central source of data collected for this study.

Prior to beginning to plan their lessons, the student-teachers were sent a link to the ReadAhead website. We were interested in the creative process regarding how they would go about using the technology to address academic language in their instruction, so it was important that the professors not dictate how the student-teachers used the program in the lesson. For instance, it might be the case that some of them used the program as a way to have their students focus on and learn the vocabulary, while others might have used it to enhance reading comprehension of the passage, and indeed this turned out to be the case. Thus, they were given no directives in class on how they should format or utilize the program for their presentations. We were also interested in discovering whether the student-teachers had plans to have the students apply the academic language in subsequent lessons and if they intended to assess their understanding of the passages or language. Once the student-teachers went to the website there were basic directions on how to navigate through the program and use it as a tool, such as how to link to their course standards and how to highlight the academic language they chose, but beyond that the direction they chose to take was left up to them.

Approximately six weeks after the student-teachers had completed the assignment they were contacted and asked if they would attend group interviews that would allow us to explore their thought processes in using the program to address academic language in their lessons. We also conducted a document analysis of the terms

in the modules that the student-teachers built to identify the proportions of Tier 1, 2, and 3 words that they highlighted for their students.

Results

Five student-teachers volunteered to sit for two different group interviews, each approximately one hour in duration. Based on the interview notes, a number of categories were identified related to the research questions, and responses from each student-teacher were classified into each of the categories. Once the student-teachers' responses were classified in this way and observations formed, the data were compared to the interview transcripts compiled by a third party from the videotaped interviews in order to assess the accuracy of the observations. Several themes emerged from the interview data: It became clear that the student-teachers had approached the use of academic language in the lessons they created with very different ends and means in mind. They also showed different patterns in whether they used academic language to activate or reinforce background knowledge. It appeared that few of the student-teachers actually considered the edTPA or its perspective on academic language when creating their lessons, which came as a surprise. An innovative application for differentiation also emerged from the process. A document analysis of the terms provided further detail to the findings.

Finding a Purpose: Means to the End

Carla was interning in a math classroom and chose the short narrative for her students to read, *One Grain of Rice: A Mathematical Folktale,* (Demi, 1997). Carla approached the use of academic language in the lesson as a way to scaffold students' understanding of the text, improve their comprehension, and thereby increase their knowledge of mathematical concepts. She reported that the terms she chose to highlight for students were predominantly Tier 2 terms, some that were novel and some that were familiar to students, which emphasized cultural references and math concepts, when applicable. However, while the story applied to exponents, it did not actually use the term *exponents* or many other terms that applied specifically to mathematics. So Carla appeared to view the academic language she emphasized not in terms of vocabulary learning, but as a bridge to connect students' prior knowledge to mathematical concepts. Carla felt that the activity was an inquiry approach with the students using the keywords in a game-like fashion to better comprehend the story but then using inference to make the leap from literature to the math concepts on their own without explicit instruction to do so.

In stark contrast to Carla's approach, Will created his lesson with the goal of building students' vocabulary, with comprehension of the passage as a peripheral objective. Will, who was teaching language arts, chose *The Gift of the Magi* (Henry & Harris, 1969) for his students to read. Will's intention was to highlight difficult terms in the story and to have students focus on them in relative isolation. In particular, he attempted to identify SAT words. He felt that the terms were difficult for his students to define without context and by having them embedded in the reading passage it might provide some context for the students to use to understand the terms. Students essentially were required to use the context of the passage to understand the words. Because the words were from the SAT word list, they were relatively foreign to students and were not meant to relate to ideas that students would have background knowledge about or to personal experiences. Some of the words were necessary to understanding the larger concepts from the passage. Unlike Carla, Will did not use the program in an attempt to get students to predict what would come next in the passage. It was used solely to focus on what he considered to be Tier 3 specialized vocabulary words. However, the lesson did differ from traditional vocabulary instruction in that the students had interpret and infer the meaning of the words from the context so they were required to use higher order thinking as opposed to simply defining and memorizing definitions.

While Carla and Will fell at the opposite ends of the spectrum in regard to how they conceptualized and operationalized the use of academic language in their lessons, the other three student-teachers who were interviewed fell somewhere along the continuum between the two. Mary was interning in a science classroom and chose a passage on the cell cycle from Kids Science World for her students to read. Shonda was also interning in a science classroom and chose two articles on volcano formation, one from Scholastic and one from National Geographic Kids Online as a method of differentiation, which will be discussed presently. Both student-teachers' thought process in creating their lesson was more directed at having their students learn the academic vocabulary than it was on using the program to enhance their comprehension of the text. Yet neither of them used an approach that was quite as concentrated on vocabulary learning as Will did, who chose only those terms that coincided with a list of SAT preparation words. Instead, both chose academic language that was a mixture of terms from the course standards combined with terms they identified as essential to the passages using their own judgment.

Shonda estimated that approximately 70% of the terms she chose came from the course standards, which were available to her in the ReadAhead program, and 30% were chosen based on her opinion on which terms her students would be required to know for assessments or would be essential to promoting future learning. Shonda concluded that the majority of the terms she highlighted for students were comprised of Tier 3

nouns. Mary, like Shonda, also used vocabulary learning as the focus of her lesson. When building her slideshow, Mary examined the course standards the program linked to, words that applied to the standards, and the textbook in order to choose the terms to be highlighted. She estimated that 20% of the terms she chose were from the standards or text and 80% were based on terms she identified that were essential to the unit she was covering. So while she meticulously combed through the standards, Mary created her list of terms predominantly based on her professional judgment. The terms, like those of Shonda, were judged to be mostly Tier 3 nouns, some of which her students had been exposed to previously.

Angie, the fifth student-teacher who took part in the interviews, used a blended approach that took both vocabulary learning and enhancing comprehension into account when creating her lesson. She was teaching in a language arts classroom and chose to use an article on Jesse Owens that she found online because the class had discussed Jesse Owens previously during a unit on the Holocaust. Angie reported that she chose mostly Tier 3 terms, in her estimation, that were specific to the time period, words the students had been exposed to previously, and words to create interest. For the words highlighted to create interest, she, like Carla, specifically wanted students to use them to predict what was to come. While she believed that most of the terms were Tier 3 nouns, Angie did use some verbs for the terms highlighted to create interest such as "fought". She checked the words from the ReadAhead list of course standards but chose not to use them and instead highlighted only the words she chose based on her own judgment.

Schema Activation and Background Knowledge

One of the theoretical attributes of the ReadAhead program was that it is meant to encourage students to make predictions when they view the probe words prior to reading each chunked section, though the student-teachers were unaware of this. It was interesting to find that two of them, Carla and Angie, specifically identified this function and created their lesson with the thought in mind that the terms they chose would stimulate their students to generate predictions. Concepts that are related to generating predictions are schema activation and building background knowledge because if students have substantial schemata in place and extensive background knowledge, they may be more likely to make accurate predictions concerning the upcoming text.

So one of the questions we posed was whether the student-teachers consciously considered schema activation and reinforcing background when creating their lessons. We found that of the three student-teachers who had predominantly focused on building vocabulary in their lessons, none of them considered how the terms may lay the foundation for background knowledge as they constructed their lessons. In retrospect this in unsurprising because they approached the lessons as a way to use text to narrow the students' attention down to specific terms, not as a way to assist them to understand the larger concepts inherent in the passage. In other words, they used an analytical process rather than one of synthesis.

However, the two students whose purpose in creating the lesson was to assist in enhancing comprehension of the whole did envision the activation of background knowledge to be central to their task. The story that Carla chose for her students dealt with rice farming in Asia. While she did not believe that most of her students would have extensive background knowledge of Asian cultures, they were largely from rural areas where farms were plentiful so they should have had schemata in place regarding farming. Carla saw their background knowledge of farming as a way to bridge the gap to their understanding of Asian culture, and ultimately to the math concepts that were at the heart of the passage. Therefore, she sought to address students' background knowledge by highlighting terms associated with rice farming that were specific to the Asian culture depicted in the story. Upon reflection, Carla indicated that she felt that because she was able to stimulate students' schema and they were able to sample what was coming next, it made reading the passage less frustrating and less intimidating for them than would otherwise have been the case and ultimately did lead to increased comprehension.

Like Carla, Angie also considered background knowledge when constructing her assignment. Her class had previously completed a unit on the Holocaust during which they covered Jesse Owens' involvement as a Black athlete and gold medal winner at the 1936 Olympic Games in Berlin. So Angie chose the reading selection on Jesse Owens specifically because she knew students already had a foundation of background knowledge on the subject. Therefore, when she identified terms in the text that would be previewed for students, she chose terms that were specific to the time period, some that they had been exposed to previously that had already been assimilated into their schema for the subject, and others that would capture their attention. And, like Carla, she intended for the terms to activate her students' schemata so they would make predictions about the upcoming chunks of text and improve their comprehension of the passage.

Conforming to the edTPA: Using and Assessing Academic Language

One area of interest in examining the student-teachers' approach to academic language was to ascertain how deliberate they were in using their lessons to address the development and assessment of academic language as it is pertains to the edTPA, in terms of function, demand, syntax, and discourse. As noted previously, they were not explicitly instructed to use the program for that purpose. To our surprise none of the teaching

candidates reported considering the edTPA or academic language at all as it applies to the portfolio, despite the fact that they were documenting their lessons on a template explicitly modeled on the edTPA and they were in the process of compiling a mock edTPA in preparation for completing the live version of the certification instrument the following semester. This seemed to suggest that the use of academic language had not become second nature to the student-teachers and they may have been addressing it in their edTPA portfolios superficially, as a way to meet the requirements of the assessment, but not as a core practice.

While none of the student-teachers revealed a metacognitive awareness of employing or building upon academic language as it pertains to the edTPA, it was still of interest whether any of them had unknowingly integrated it into their planning. Did they specifically consider Tier 2 terms such as *analyze* or *evaluate* that would act to bridge students' understanding and allow them to access meanings of domain-specific Tier 3 terms? Had they gone beyond using the RA program as a way to simply introduce vocabulary and affect comprehension of the text and considered extending the lesson so that their students would apply the terms themselves? Did they plan to remediate or assess students' understanding of the academic language?

As previously noted, the student-teachers reported focusing predominantly on what they believed to be Tier 3 terms. None of them indicated that they had intentionally highlighted terms related to cognitive skills or higher order processes central to edTPA academic language such as such as comparing, analyzing, applying, evaluating, synthesizing, and persuading. This, of course, was likely a function of those terms not being prevalent in the passages that they chose for their students. All of the student-teachers did, however, either include a during-reading accountability measure requiring their students to engage with the academic language or extend the lesson post-reading in order have their students more actively utilize the language and concepts.

For an accountability measure, Shonda had her students complete a double entry journal while they read the selection. She was surprised to find that on the left side of the page, while her students were able to successfully document explicit evidence from the text and often used the terms she highlighted in RA for this aspect, they were far less successful in constructing in-depth reflections or making implicit connections on the right side of the page. This would suggest that the students were engaged in the lower order processes involved with surface level observations yet struggled with the critical thinking and more advanced reasoning skills that would allow them to synthesize or interpret to create deeper meaning.

Will, like Shonda, employed a during-reading accountability measure. It was an organizer listing the probe words from the passage which were the SAT terms he had identified. His students were tasked with providing definitions for the words by using context clues from the passage as they read. While listing definitions would only require lower level thought processes in most cases, because students had to use inference to extract meaning from the context of the passage, the activity did clearly introduce elements of active reasoning. Will concluded in hindsight, however, that the accountability measure and the isolated focus on specific SAT terms actually impeded comprehension because it drew students' attention away from fluent reading.

Three of the student-teachers utilized post-reading extension activities. Carla administered a subsequent assessment that was based on the story selection and referenced the main character's situation. It required students to apply their learning to a new and somewhat different situation. This would be an example not only of application, but also of complex transfer skills that would encompass a variety of higher order processes. Likewise, Angie created an assignment for which her students were later expected to use the probe words that she highlighted in the program. Her students were asked to write a narrative paragraph in which they included the highlighted terms from the RA presentation applied correctly in context which again would involve skills such as evaluation and synthesis. Mary implemented a posttest on which students were required to provide definitions for the terms from the passage that she had selected as probe words. This was a lower order task that would draw on memory rather than active reasoning and would not resemble the application of academic language as depicted in research and the edTPA framework. However, Mary also employed s second assessment that asked students to apply the terms in various situations she presented to them in much the same way that Carla and Angie did, and this did introduce elements of higher order thinking.

So in terms of the student-teachers addressing academic language as it is conceptualized by the edTPA, the results were nuanced and somewhat mixed. None of the student-teachers consciously or intentionally directed their lessons towards building upon their students' understanding of academic language despite the fact that the RA program was particularly well suited for concentrating on it. None of them would have been likely to document the inclusion of academic language in their edTPA portfolios or to provide an explanation of its use in the heavily weighted rationale sections. Yet each of them did actually address academic language in a way that went beyond the most traditional and typical forms of vocabulary learning, which commonly entail little more than the memorization of Tier 3 terms and their definitions. Each of the student-teachers incorporated an extension activity that required their students to use higher order thought processes and apply their understanding in some way. Thus, while it appears the student-teachers had not yet developed the metacognitive awareness that would allow them to be cognizant of using academic language to scaffold their students' learning, they seemed

to fall back on their previous training by including student-centered tasks that served to increase engagement and stimulate students' use of academic language central to the content.

Differentiation

While differentiation was not a primary focus of this research at the outset, we felt the need to include a section on it in order to detail what we view as one student-teacher's innovative and resourceful use of the RA program to differentiate her lesson. Shonda identified two articles focusing on volcanoes, the content matter that she was covering with students in the course of the unit. She concluded that one, the article from Scholastic, was better suited to her more advanced readers and the other, from Nat Geo Kids Online, was more well-suited for the less advanced readers, including a number of ELL students. She used the Flesch-Kincaid grade level indicator in Word to ascertain the reading level of each passage. Surprisingly, the article she felt was more challenging actually was rated as being written at a lower reading level than the other by the Flesch-Kincaid indicator, but she used it the way she originally intended and reported that the more advanced readers did find the passage to be challenging regardless of its lower rating.

For the passage intended for the less advanced readers, Shonda generated three different presentations. In addition to the original English version of the article, she used a translator function to create one version in Spanish and another in Vietnamese. So for this particular lesson, there were four different presentations based on the two original articles that were available to her students- one in English for the more advanced readers, one in English for the less advanced readers, one in Spanish, and one in Vietnamese. The same probe words were used for each version, so while the students read the passage in the language they were most comfortable with, they all were prompted to focus their attention on the same scientific concepts. Shonda essentially used the RA program to create very complex differentiation with one high level passage and one low level passage in three different languages.

Document Analysis

Four groups of five student-raters evaluated each list of terms the student-teachers had created within their lessons in order to identify which tier each term fell into. The student-raters only analyzed terms that were within their own content areas and were unaware of how the student-teachers had classified the terms. The student-raters examined each term as a group and reached a consensus on the outcome. Below in Table 1 you will find the results of the student-raters' analysis.

Table 1: *Tiered Words*

Student-Teacher	#words	Tier 1% (*N*)	Tier 2% (*N*)	Tier 3% (*N*)
Carla (Math)	54	59.3% (32)	37% (20)	3.7% (2)
Angie (ELA)	24	54.2% (13)	37.5% (9)	8.3% (2)
Shonda (Science)	20 (low level)	15% (3)	40% (8)	45% (9)
Shonda (Science)	19 (high level)	26.3% (5)	26.3% (5)	47.4% (9)
Mary (Science)	14	0% (0)	0% (0)	100% (14)
Will (ELA)	13	0% (0)	30.8% (4)	69.2% (9)

Upon examining the results of the student-raters assessment, a number of trends emerged. First, Carla and Angie embedded the most terms in the reading assignment, 54 and 24 respectively. These were the two student-teachers whose purpose in constructing the assignment was focused most closely on using it to enhance their students' comprehension of the text. Shonda, Mary, and Will, who reported that their primary purpose was extending students' vocabulary, embedded fewer terms, 20, 19, 14, and 13 respectively. Will, whose lesson was the most narrowly focused on vocabulary of any of the five student-teachers, embedded the fewest words, only 13. In terms of absolute numbers, this resembled traditional vocabulary instruction during which a class may define and study 10 words per week.

The next trend was found in the percentage of terms that fell into the respective categories. Again, the student-teachers whose purpose was in enhancing comprehension showed a different pattern from those whose purpose was focused on vocabulary learning. Carla and Angie highlighted the greatest percentage of Tier 1 terms by far (59.3% and 54.2% respectively), as well as the least Tier 3 terms (3.7% and 8.3%). Indeed, more than half of the terms highlighted by each of these student-teachers was a Tier 1 term that students would be exposed to in daily life. As they reported, their intention was to stimulate students' interest in the passage, encourage them to make predictions, and urge them to make connections between ideas in order to improve comprehension. Thus, with this focus, Tier 3 terms may have been less essential in meeting their desired ends.

The other three student-teachers, Shonda, Mary, and Will, who were to some degree more concerned with vocabulary learning, highlighted fewer Tier 1 terms (15%, 26.3%, 0%, and 0% respectively), with two of them highlighting no Tier 1 terms at all. They also embedded a much higher percentage of Tier 3 terms (45%, 47.4%, 100%, and 69.2%), and in Mary's case all of the terms she chose were Tier 3. One explanation for this

could be a function of the content area. Both Shonda and Mary were teaching science, so they might have felt that the terms that were specialized to the content would be more beneficial to the curricular unit and future learning than general comprehension of the passage. And because Will was concerned with having his students learn SAT words, he mostly chose terms that fell into the Tier 3 category.

The differences between Tier 2 terms were less pronounced, with most of the assignments falling between 26.3% and 40% in that category (37%, 37.5%, 40%, 26.3%, and 30.8%). The exception was Mary, who chose no Tier 2 terms (0%) and limited her assignment's focus to only Tier 3 terms. The relatively uniform choice of Tier 2 terms may be seen as being consistent with the definition of academic language portrayed in the research literature and edTPA-related literature because it is the Tier 2 academic terms that bind the more complex words together and are necessary for more thorough comprehension. A focus on these Tier 2 terms also shows a divergence from traditional vocabulary instruction that has tended to emphasize only a brief list of Tier 3 specialized words and their corresponding definitions.

Also of interest was whether the student-teachers had correctly categorized the terms they chose. During the interview process they were asked which tier they had focused their assignment on, though they were not asked to classify each term individually. Thus, each student-teacher provided an approximation of which tier most of the chosen terms had fallen into, and we were able to compare their conclusions to those of the student-raters who analyzed the documents. Carla reported that the terms she chose to highlight were predominantly Tier 2 terms. Yet the raters found that while she had indeed included many Tier 2 terms (37%), the vast majority of the terms she chose were Tier 1 words (59.3%). Angie stated that she had selected mostly Tier 3 nouns. However, she actually chose very few Tier 3 terms (8.3%) and instead emphasized Tier 1 terms the most (54.2%). This suggests that she did not have a clear understanding of how to classify the terms and also implies that it was unlikely that she had considered the different levels of academic language when constructing the assignment.

Shonda concluded that her assignment revolved around the acquisition of Tier 3 nouns. This proved to be accurate, as the assignment she created for her lower level readers contained 45% Tier 3 terms and the one created for the higher level readers contained 47.4% Tier 3 terms (both pluralities), combined with 40% and 26.3% Tier 2 terms, respectively. Curiously, the assignment for the higher level readers actually contained more Tier 1 terms (26.3%) than the one for the lower level readers (15%). So while Shonda was more successful in identifying the classifications of the terms she chose, it appears that the lower level readers may have been exposed to more sophisticated terminology, with 85% of the terms being either Tier 2 or Tier 3, while the higher level readers only encountered 73.7% of the words at one of those two levels. Of the two students who used the assignment with the greatest intention of building vocabulary, Will and Mary both indicated they focused almost exclusively on Tier 3 terms. This did indeed turn out to be the case, with Will's assignment being comprised of 69.2% and Mary's being 100% at the Tier 3 level.

Based on this portion of the analysis it appears that the student-teachers who used the assignment to focus on vocabulary had a clearer understanding of where their chosen terms fell on the continuum of tiered academic language. They were much more likely to choose terms that would be classified in the two higher levels combined, as general academic language (Tier 2) and content-specific academic language (Tier 3). The student-teachers whose purpose was to enhance comprehension of the text were much more likely to choose common language that students would encounter in their daily lives (Tier 1). This is reasonable considering that they were attempting to highlight terms that would capture students' interest and cause them to generate predictions, and common terms may be more likely to serve that purpose. However, it also suggests that they were unaware of the level of complexity of the terms they chose or how likely they were to be related to general academic language or content-specific language.

Discussion

The purpose of this exploratory research was to observe how undergraduate teaching candidates used academic language in the planning and implementation of lessons when they were provided with a cognitive tool, the ReadAhead program, that was designed to assist teachers in scaffolding students' content literacy development. The student-teachers had previously completed a course on content literacy instruction within their disciplines and were in the midst of their internships, preparing to complete their edTPA portfolio assessments. Because the use of academic language is central to the edTPA certification instrument, this study allowed us to examine not only the process the aspiring teachers used, but also how cognizant they were in systematically addressing academic language in their instruction.

The student-teachers were not given directives on how they should use the ReadAhead program so they were free to integrate it into their lessons any way they saw fit. This led to them using the program and implementing their lessons with very different purposes in mind. Two of the student-teachers decided to use the program to enhance students' comprehension of the passages they chose for them to read. Two others chose to use the program primarily to focus on certain vocabulary within the passages in order to assist students in expanding their understanding of the academic language, with comprehension being a peripheral goal. The fifth

student-teacher acknowledged that she had both purposes in mind, vocabulary building and comprehension, though vocabulary learning was the primary goal.

We found that the purpose that each student-teacher had in constructing his or her lesson influenced other aspects of the lesson in important ways. For example, the two student-teachers whose main goal was to enhance their students' reading comprehension reported that they chose terms to highlight for the specific purpose of activating schema and addressing students' background knowledge. This is considered a best-practice in regard to reading development (Cuevas, Irving, & Russell, 2014; Cuevas, Russell, & Irving, 2012; Dinnel & Glover, 1985; Guthrie, et al., 2006; Kozminsky & Kozminsky, 2001; Snapp & Glover, 1990; Tracey & Morrow, 2006), and it coincides with the current understanding of academic language as defined within the literature base (Wilhelm, 2007; Zwiers, 2004; Zwiers, 2007). These two student-teachers did not limit the academic language they chose to Tier 3 words that were specialized to their content area, but instead chose terms that could tie intricate meanings together and would encourage active cognitive processes such as prediction and inference.

In contrast, the student-teachers who focused on vocabulary building as the goal of their lessons did not consider schema activation or prior knowledge when planning their lessons. Their purpose was to have their students use context clues to learn the meaning of Tier 3 terms rather than to assist the students in comprehending the meaning in the passage. This seemed to be consistent with more traditional models of instruction that focused on building vocabulary with the intention of improving comprehension over time (Alfassi, 2004; Beck, Perfetti, & McKeown, 1982; Connor, Morrison, & Petrella, 2004; Joshi, 2005; Ouellette; 2006). Thus, the student-teachers in this group were not concerned with having students synthesize the intricate parts to come to a deeper understanding of the whole, and instead took an analytical approach that required students to extract narrow meanings of the terms from isolated portions of the text.

The student-teachers' chosen purpose also appeared to affect other attributes of the lesson as it related to academic language. The two student-teachers whose goal was to improve students' comprehension chose far more terms to highlight in their presentations, yet those terms were much more likely to be common words (Tier 1) or general academic language (Tier 2). This was consistent with their desire to stimulate students' thinking and have them construct meaning by considering the terms they would have already been familiar with, as proposed by Baumann, and Graves (2010) and Zwiers (2004; 2007). The student-teachers whose goal was to build students' vocabulary showed exactly the opposite trend. They chose far fewer words to highlight, and the terms they did highlight were much more likely to be specialized, content-specific vocabulary (Tier 3). This served the purpose of having their students focus their attention on a limited number of difficult words in the hope that reading them in context would help them to retain the meaning of the individual words.

One surprising finding was the student-teachers' lack of metacognition, or lack of a conscious attempt to address academic language in their lessons, even though they planned the lesson using an edTPA-aligned template that emphasized the integration of academic language and the fact that the ReadAhead program was particularly well suited to focusing on academic language. None of the five student-teachers reported that they thought of the presentation they created for their students in terms of academic language. None of them reported that they consciously considered academic language in regard to how their students would actively use the language later or display mastery of the concepts. The student-teachers did not at all contemplate the four domains of academic language essential to the edTPA- discourse, demand, function, or syntax. Yet, when they were pressed concerning extension activities and assessments, it became clear that all of them later did incorporate active learning practices involving the language from these lessons in a way that certainly would qualify as meeting the criteria for academic language as defined by the edTPA. This suggests that their prior training was effective in helping guide the student-teachers to include student-centered, active learning in their instruction and in extending their lessons to require their students to become involved in higher order thought processes. But, interestingly, they appeared to be unaware they were doing so and would not have elaborated on this in the crucial rationale section of the edTPA portfolio.

Similarly, even though all of the student-teachers had successfully completed a content literacy course, most of them did not show a great deal of accuracy in identifying the levels of vocabulary that they focused on in their lessons. All but one overestimated the specificity of the terms they chose. The two student-teachers who emphasized reading comprehension estimated that they had chosen mostly Tier 2 and Tier 3 terms when in fact they had chosen mostly Tier 1 terms. Those student-teachers whose purpose was in vocabulary building were more accurate in identifying the levels of the terms they chose, though two of them also tended to overestimate the complexity of those terms. The fact that they did not consider academic language when planning their lessons and that they had difficulty identifying the correct tiers of the terms they chose suggests that they were not deliberate in how they applied academic language within their lessons and that the success of the lessons, in terms of academic language, may have been a result of previous training rather than conscious effort.

The most interesting use of the ReadAhead program was more a function of the student-teacher's creative lesson planning than it was a concentrated effort to address academic language as defined by the literature. She was able to differentiate her reading assignment by using two different science passages and translating what she determined to be the lower level passage into two different languages in addition to English.

She effectively created four different reading assignments in three different languages, all of which emphasized similar academic language. Without the use of such technology this type of differentiation would not have been possible without a very lengthy planning process, one that would not be practical for teachers struggling with the day-to-day time constraints associated with the varied responsibilities of teaching. Yet this student-teacher was able to efficiently address content knowledge and academic language for both high and low level readers in addition to meeting the linguistic needs of ELL students without allowing them to fall behind in terms of science content.

Conclusions, Limitations, and Future Research

The most interesting findings of this study were the differing ways in which the student-teachers approached their lesson creation and how the purpose they had in mind influenced subsequent aspects of their lessons. For instance, those student-teachers whose goal was improving reading comprehension highlighted many more terms for their students, and those terms were more likely to be common Tier 1 and Tier 2 terms. Thus, they required their students to draw upon background knowledge and use the process of synthesis as they read. In contrast, those who focused on vocabulary building highlighted far fewer terms, and those terms were more likely to be more sophisticated Tier 3 content-specific vocabulary. Their students were required to use an analytic approach and draw from the surrounding context to establish narrower meanings.

One curious finding was that the student-teachers showed little metacognition in regard to integrating academic language into their lessons, yet incorporated extension activities that compelled their students to apply the terms using higher order thinking processes. This suggests that the previous content literacy course they had taken was effective in training them to actively engage their students in developing academic language and domain specific vocabulary. They essentially did what they were taught to do by extending the lesson to include student-centered tasks that promoted active cognitive processing. But it also suggests that the student-teachers had a limited understanding of the expectations of the edTPA. The concept of academic language and its importance to lesson implementation seemed to remain a vague one. Some might argue that this could be remedied by weaving more explicit instruction regarding the use of academic language and how it applies to the edTPA into education courses such as the content literacy courses offered. Yet this might be construed as "teaching to the test" with professors showing student-teachers how to pass without the candidates developing understanding for themselves.

The study was somewhat limited by the small sample size. The results certainly cannot be generalized to other cohorts of student-teachers who might be going though similar experiences at other universities. However, it may be instructive to other educators to examine the process these student-teachers used and the outcomes of that process. It is likely that teaching candidates at other universities would similarly have a less than crystallized understanding of academic language and the most effective ways to address it within the context of newly created lessons, in addition to having vague notions about what is expected in that regard on the edTPA certification test.

Another limitation is that there was no way to measure the outcome of the instruction in terms of the middle school students' learning. It would be interesting to identify whether the students whose activities focused on comprehension building showed inferior or superior learning outcomes to those whose activities focused on vocabulary building. Of course, this would have required a much larger sample size and a much more complex research design. Our purpose was to examine the student-teachers' processes in addressing academic language, but future research could shift that focus to student outcomes.

There is strong consensus in the field of education that academic language is essential to current and future learning outcomes. Each content area has domain-specific terminology that students must master in order to build expertise in the field. Yet there is also academic terminology that is used consistently across domains, and this form of academic language has too often been left unaddressed as teachers assumed that students would have already mastered the terms that describe thought processes and bind the content-specific vocabulary together. These issues have come to the forefront in recent years and have started to become a staple of teacher education programs, as well as central components of teacher certification instruments such as the edTPA. But much of the field remains undeveloped, and there is limited consensus regarding the definitions involved, much less how practice should reflect these constructs.

Teacher preparation programs must continue to methodically address the issue of integrating academic language into instruction because it is likely that many aspiring teachers, like those who participated in this research, continue to have a limited understanding of the processes involved. The subject of academic language will not only influence the licensure of new teachers but also the quality of learning that their students experience through the years. Ultimately, exploratory research such as this should be followed by larger scale experimental studies that track student outcomes in order to help us better understand how students respond to a variety of instructional approaches and how academic language may be used to address the needs of a variety of learners.

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Declarations
This research included no financial or non-financial competing interests and no outside funding was involved.