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Preservice Teachers' Use of Elementary Literacy Teacher Performance Assessment to Plan, Implement, and Analyze Metacognitive Strategies

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Abstract
This study examined 18 preservice teachers' use of literacy performance assessment to plan, implement, and analyze metacognitive strategies used in literacy lesson plans delivered for elementary students in field experience classrooms. In a literacy methods course, they learned about metacognitive strategies. They also developed literacy lesson plans and taught them in their field experience classrooms while completing the educational teacher performance assessment (edTPA) in the elementary literacy field. Data were collected from pre- and post-surveys on knowledge of metacognitive strategies and literacy, lesson plans, and edTPA commentaries. Results revealed that: (1) preservice teachers carefully selected and used appropriate metacognitive strategies based on their students' needs and lesson objectives; (2) they analyzed their use of metacognitive strategies critically and planned to use them more in their future teaching; and (3) they increased their awareness, knowledge, and skills of using metacognitive strategies.

Key Words: Metacognitive strategies, field experience, teacher performance assessment, lesson planning, reflection introduction

Introduction

Teachers consider literacy important in school because all students need adequate literacy knowledge and skills to learn various subjects. They need to understand what is being asked to solve math problem questions. They need to know the features of nonfiction, such as comparison and contrast, when they read science textbooks. They need to know how to look for a main idea and for supporting details when they read textbooks and information in a social studies class and other subject-area classes.

Related to literacy, teacher educators consider metacognition a powerful tool to promote student learning (e.g., Baker & Brown, 1984a; Brandford, Brown, & Cocking, 2000; Israel, Block, & Bauserman, 2005). Metacognition means thinking about one's thinking (Hacker, 1998; Harris & Hodges, 1995); it includes knowledge about cognition, evaluation, and regulation of cognition (Flavell, 1976). Research studies related to metacognition in education, particularly in reading, show that high-performance students use metacognitive strategies (e.g., monitoring, self-questioning, and setting a

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purpose for reading) more effectively and appropriately than struggling students (Baker & Brown, 1984; Israel, 2008). Teachers can teach metacognitive strategies. Studies indicate that students who receive training and support in the use of metacognitive strategies increase their use of these strategies and improve comprehension (e.g., Edmonds et al., 2009; Sadoski, 1983; Vaughn et al., 2011). With evidence of the effectiveness of metacognitive strategies, teacher educators must teach these strategies to preservice teachers so that they can use these strategies with their future students.

In university-based programs in the United States, teacher educators commonly use performance assessments during which preservice teachers plan and teach lessons in their assigned classrooms, then reflect on and analyze their teaching in authentic ways (Brown, 2017). In the State of Wisconsin, the educational teacher performance assessment (edTPA) serves as a required assessment; preservice teachers must pass it for licensure purposes. The edTPA gives preservice teachers meaningful opportunities to plan carefully and teach their lessons and to analyze their teaching critically.

Researchers have examined how preservice teachers view and experience teacher performance assessments (e.g., Hildebrandt & Swanson, 2014; Stewart, Scalzo, Merino, & Nilsen, 2015). For example, in the study by Okhremtchouk, et al. (2009), 44% of preservice teachers who completed their teacher performance assessment in different areas, such as English, science, and math, reported that this type of assessment was helpful during their student teaching. Repeatedly, 62.5% of preservice teachers found the teacher performance assessment helpful for their reflection on teaching practices (Okhremtchouk, et al., 2009). Stewart, Scalzo, Merino, and Nilsen (2015) examined characteristics of preservice teachers when they completed their teacher performance assessment and found among high performing preservice teachers key teaching elements, such as using formative assessments, scaffolding to support children's academic language use.

Similarly, researchers examined how preservice teachers view, learn, and use metacognitive strategies and how preservice teachers' experiences impact their learning (e.g., Dianovsky & Wink, 2011; Dogany & Ozden, 2011; Lesley, Watson, & Elliot, 2007; Menz & Xin, 2016). For example, Menz and Xin (2016) examined 71 preservice teachers' awareness of their learning and metacognitive knowledge using reflective writing prompts in three course offerings. They found that preservice teachers demonstrated their metacognitive knowledge in the area of evaluating strategies and self as well as awareness of self-processed knowledge. Van Blerkom and Van Blerkom (2004) examined college students' use of self-monitoring strategies in a college reading remediation course for those who did not meet their academic expectations in their first semester and in an adolescent development course offered for students who met their academic expectations. After these college students completed their courses, they increased their use of self-monitoring strategies, bringing into effect the instruction on metacognitive strategies. While previous research has illustrated preservice teach-

ers' views of teacher performance assessment as well as the effect of instruction on metacognitive strategies, the current research is limited on how they develop awareness, implement, and reflect on their use of metacognitive strategies in the framework of teacher performance assessment. Therefore, this study fills that void by examining how preservice teachers plan literacy field experience lessons using metacognitive strategies in their field sites and analyze implementation using the elementary literacy edTPA. The researcher set the following three research questions:

1. How do preservice teachers plan and apply metacognitive strategies in their field lessons using the elementary literacy edTPA?
2. How do preservice teachers analyze their implementation of metacognitive strategies using the elementary literacy edTPA?
3. What is the influence of preservice teachers' planning, applying, and analyzing their lessons and teaching through the elementary literacy edTPA with regard to metacognitive strategies?

Theoretical Framework

Metacognitive strategies

Flavell (1976) identified metacognition as a key element in supporting student learning and defined it as: "the active monitoring and consequent regulation and orchestration of these processes in relation to the cognitive objects or data on which they bear, usually in the service of some concrete goal or objective" (p.232). Flavell (1979, p.906) also describes metacognition as "knowledge and cognition about cognitive phenomena" which involves one's self-regulation.

Metacognitive strategies engage students in the critical thinking process (Menz & Xin, 2016). According to Israel (2007), metacognitive strategies can be described under three categories: planning strategies, monitoring strategies, and evaluating strategies. Planning strategies for reading include activating one's background knowledge; setting a purpose of reading; previewing a text; noticing features of texts such as headings, subheadings, and words in bold; and making predictions. For writing, students can set a purpose of writing, brainstorm ideas while keeping their audience in mind, and identify what they already know about a topic. Monitoring strategies for reading include determining meanings of key words, self-questioning, looking for key information while reading, adjusting reading speed, going back in the text to find relationships among ideas, and checking if guesses about the text are right or not. Monitoring strategies for writing include checking if students achieve their purpose while writing and identify effective strategies to help their writing or to accomplish their purpose of writing. Evaluating strategies in reading include: thinking like an author; evaluating the text (such as asking "Did the author use appropriate ways to deliver his/her message to the reader?" "Did the author organize information well in his/her passage?"); checking if students' predictions are right, summarizing what they read to reflect on

important information in the text; and retelling in their own words. Evaluating strategies in writing include assessing if students accomplished the purpose of writing, appropriately revised their work, and answered questions they established or items they were asked to include in their writing.

Researchers document that metacognitive strategies support student learning (Behbahani, 2016; Dogany & Ozden, 2011; Hare & Borchardt, 1984; Taraban, Kerr, & Rynearson, 2004; van Blerkom & van Blerkom, 2004). They also document that explicit teaching of metacognitive strategies positively impacts students' reading comprehension skills (e.g., Allen & Hancock, 2008; Baker & Brown, 1984b; Isaacson & Fujita, 2006; Pressley & Afferbach, 1995) as well as writing including self-regulation (e.g., Curwen, Miller, Wehite-Smith, & Calfee, 2010; Graham & Harris, 2009; Hulya, 2010; Menz & Xin, 2016; Negretti, 2012; Negretti, 2012; Santangelo, Harris, & Graham, 2008). Learners who possess self-regulation can use strategies such as planning, setting goals, organizing information, and self-evaluating (Williams & Atkins, 2009). They effectively use self-regulated strategies and modify their learning strategies to meet their learning goals (Zimmerman, 1990). Researchers advocate the Self-Regulated Development Strategy (SRSD), which involves self-regulated learning (Harris, Graham, Friedlander, & Laud, 2013). Using the SRSD approach, students develop their writing skills (e.g., Graham, McKeown, Kiuhara, & Harris, 2012) and reading skills (Nash-Ditzel, 2010). Huang and Newbern (2012), Sheorey and Mokhtari (2008), and Upton (1997) conclude that metacognitive strategies serve as a key element to support English learners' reading comprehension.

Teacher performance assessments

Teacher education in the United States

Teacher education preparation supports preservice teachers in developing their professional competencies: skills, knowledge, and practices (Brown, 2017). Traditionally, teacher education programs used summative assessments to measure preservice teachers' content and pedagogical knowledge (Wei &Pecheone, 2010). In particular, high-stakes assessments such as Praxis tests have been used in teacher education programs to demonstrate pre-service teachers' content and pedagogical knowledge in the United States. However, this assessment is limited to measuring teachers' knowledge and skills to teach subjects in a meaningful way. Darling-Hammond (2006, 2010) documents a weak correlation between high-stakes tests and teacher effectiveness (e.g., the ability to teach). Research suggests preservice teachers must be ready to accommodate the academic needs of all students once entering classrooms when hired (SCALE, 2013).

Performance-based assessments

Therefore, teacher educators have transitioned from high-stakes assessments to

performance-based assessments to measure teacher readiness (Hildebrandt & Swanson, 2014). Currently, state and national accreditation agencies require that "teacher education programs provide evidence that graduates have learned to teach" (Wei & Pecheone, 2010, p.69). A teacher performance assessment provides future teachers with opportunities in an authentic context to develop and demonstrate their teaching knowledge, skills, and abilities (i.e., teacher readiness) (Hildebrandt & Swanson, 2014). The Stanford Center for Assessment, Learning and Equity (SCALE) in collaboration with the American Association of Colleges for Teacher Education (AACTE) developed the educational teacher performance assessment (edTPA) as: "a performance-based, subject-specific assessment and support system used by teacher preparation programs throughout the United States to emphasize, measure and support the skills and knowledge that all teachers need from Day 1 in the classroom" (SCALE, 2018). The edTPA serves as a summative assessment. Preservice teachers in teacher education programs in the United States complete it at the end of their program for licensure or certification (AACTE, 2018a). Currently, 830 teacher education programs in 41 states and the District of Columbia in the United States utilize the edTPA at various levels from full implementation to progressive implementation (AACTE, 2018b).

The edTPA measures preservice teachers' specific content and pedagogical knowledge across a wide range of teaching areas, including early childhood, elementary, middle level, and secondary education for various subject areas. It consists of three tasks: Task 1 planning, Task 2 instruction, and Task 3 assessment. Task 1 includes several documents, including context for learning, a planning commentary, and lesson plans preservice teachers developed for their children in the classroom. The context for learning document asks them to describe the school (i.e., location, special features of school), the class (i.e., textbooks, grouping instruction, resources), and the students in the classroom (i.e., grade level; students who need support, accommodations, and modifications). Task 2 includes an instruction commentary along with self-selected video clips of their teaching in their assigned classrooms. Task 3 includes an assessment commentary and student sample work in which teacher candidates provide evidence of their effective feedback to students regarding their lesson objectives.

Preservice teachers develop three to five lesson plans for one unit, teach them in their assigned classrooms while videotaping their teaching, select two video clips, provide student work samples including preservice teachers' feedback, and analyze their teaching using edTPA commentary templates provided by the SCALE. Fifteen rubrics are used to assess preservice teachers' edTPA work, five rubrics for each task (SCALE, 2013). The State of Wisconsin piloted the edTPA between September 2015 and August 2016. Then in September 2016, the Wisconsin Department of Public Instruction fully implemented it, designating a required passing score.

Reflection using the teacher performance assessment

Not only does the edTPA give preservice teachers opportunities to demonstrate their content and pedagogical knowledge in authentic ways, but it also gives them opportunities to reflect on their planning, instruction, and assessment. For example, looking back on her edTPA experience, a former preservice teacher, now a licensed teacher, testified that:

> *The edTPA required us to reflect, in writing, every single day, but also over longer spans of time. I'm talking about critical, objective reflection based on evidence. We had to ask and answer: 'What worked today? What didn't? For whom? Why? What should I do about it? And most importantly, how do I know?'* (SCALE, 2013, p.8).

As her testimony indicates, preservice teachers benefit from many opportunities to reflect on their planning, instruction, and assessment of student learning by completing teacher performance assessments (Darling-Hammond, 2010). A preservice teacher who completed a teacher performance assessment in another state reported that her experience was very valuable because it made her reflect on her teaching *"in a different, much deeper way"* (Darling-Hammond, 2010, p. 16). Chung (2005) also followed preservice teachers who completed the teacher performance assessments and examined impacts after they completed the assessment. She summarized that preservice teachers reported that they improved in their abilities to reflect on their teaching and assessment of student learning (Chung, 2005). Other researchers (e.g., Davis & Armstrong, 2018; Jacob, Smith, Swars, Smith, & Myers, 2015) illustrate the effectiveness of the edTPA to support preservice teachers learning and continually developing their knowledge and skills, becoming reflective educators, and demonstrate readiness to teach in real classrooms immediately when hired. This type of meaningful assessment that requires critical reflections helps preservice teachers develop professional competence (Lalor, Lorenzi, & Rami, 2014).

Methods

Research design

The researcher used a mixed-method research design. Experts use this research approach "to research in the social, behavioral, and health sciences in which the investigator gathers both quantitative (closed-ended) and qualitative (open-ended) data, integrates the two, and then draw interpretations based on the combined strengths of both sets of data" (Creswell, 2015, p.2). For quantitative data, the researcher used a paired t-test to determine if differences exist between population means for pre- and post-scores of preservice teachers' awareness, knowledge, and skills in relation to metacognitive strategies at a 5% level of significance. For qualitative data, the researcher used a content analysis research approach. Content analysis is a research approach "for making replicable and valid inferences from texts (or other meaningful

matter) to the contexts of their use" (Krippendorff, 2013, p.18).

Participants and context

This research was conducted in a teacher education program in the United States at a midwestern university. The teacher education program in which this study was conducted offers various majors such as early childhood, elementary/middle school, and middle/high school in all subject areas and requires a teacher performance assessment for their teaching licensure. Typically, preservice teachers in this teacher education program complete at least two field experiences and at least one semester of student teaching, depending on majors and minors. Most of the placements for field experiences are assigned at partnership schools.

Eighteen preservice teachers participated in this study. Among them were nine participants (50%) majoring in early-childhood/elementary education (ages 0-11) and nine participants (50%) majoring in elementary/middle level education (ages 6-13). Most participants were female (16; 88.9%); two participants were male (11.1%). Eight participants (44.4%) were juniors; ten participants (55.6%) were seniors.

This research study was conducted for one semester in a literacy methods course with a field experience attached to the course. This literacy methods course focused on teaching reading/literacy strategies such as reading comprehension and techinques for elementary and middle schools. It covered pedagogy and applicatio of best practices in liteeracy instruction. Preservice teachers taking this methods course also learned about how to develop full literacy lesson plans. In addition, the participants completed their field experiences in one of two elementary schools in the same community. They completed approximately three half days in the field experience each week throughout the semester. These field elementary schools (pre-k to Grade 5) were located in a rural area. Preservice teachers were placed in their field classrooms serving grades 1 to 5. It was their first field experience within the teacher education program at a regional state university.

The researcher explicitly taught metacognitive strategies in the literacy methods class during the semester when these preservice teachers completed their field experiences. She first described metacognition and provided a framework of metacognitive strategies. She described the three metacognitive functions of declarative, procedural, and conditional knowledge and explained sample metacognitive strategies for each knowledge. She helped preservice teachers visualize how they could implement effective metacognitive strategies before, during, and after reading and writing assignments. She also modeled sample metacognitive strategies (e.g., think-aloud) and asked preservice teachers to practice these strategies in small groups or in pairs. She asked each student to plan a mini-lesson using metacognitive strategies (e.g., interactive read-aloud, Question-Answer-Relationships, learning logs, reciprocal questioning) and to teach the lesson to the whole class. For each mini-lesson, class members discussed the advantages of using these strategies and how to modify them for their

field classrooms and/or future classrooms.

Instruments

The researcher used three instruments in this study: anonymous pre- and post-surveys on metacognitive strategies and literacy, literacy lesson plans, and edTPA planning and instruction commentaries.

Pre- and Post-Surveys

Preservice teachers completed anonymous pre- and post-surveys on metacognitive strategies and literacy at the beginning and at the end of the semester. The surveys were developed by the researcher based on a literature review of one's awareness, knowledge, and skills in the areas of metacognitive strategies and teacher education (D'Andrea, Daniels, Noonan, 2003; Mokhtari, Dimitrov, & Reichard, 2018; Mokhtari & Reichard, 2002; Perkins, 2012; Schraw & Dennison, 1994). The surveys consisted of three parts. In part one, preservice teachers identified major, gender, and academic level. In part two, preservice teachers rated nine four-point scale questions (1-strongly disagree, 2 – disagree, 3- agree, 4- strongly agree) on their awareness, knowledge, and skills in relation to metacognitive strategies for diverse learners across subjects. These nine questions were: 1. *"I am aware of the importance of using metacognitive strategies in teaching."* 2. *"I am aware of the importance of teaching for all students including diverse learners."* 3. *"I am aware of the importance of integrating literacy in various subjects across the curriculum."* 4. *"I am knowledgeable about metacognitive strategies in teaching."* 5. *"I am knowledgeable about teaching for all students including diverse learners."* 6. *"I am knowledgeable about how to integrate literacy in various subjects across the curriculum."* 7. *"I am prepared to teach metacognitive strategies in teaching."* 8. *"I am prepared to teach for all students including diverse learners."* 9. *"I am prepared to effectively integrate literacy in various subjects across the curriculum."*

In part three, preservice teachers answered five open-ended questions on metacognitive strategies. For example, two prompts asked them to define metacognition and metacognitive strategies. Another prompt asked the question: *"What do you think about using metacognitive strategies in your teaching?"* In addition to these five open-ended questions, they were given one open-ended prompt in the post-survey: *"Reflect on how you embedded metacognitive strategies in your field lesson plans and how your planning, instruction, and reflections through the edTPA impacted the way you view metacognitive strategies."*

Literacy Lesson Plans

In this literacy methods course, preservice teachers learned for the first time how to develop a full literacy lesson plan. They learned how to develop measurable lesson objectives for selected standards; how to align objectives, teaching, and assessment;

and how to develop observable assessments. They developed two connected lesson plans to implement in their field experience classrooms. They were directed to include metacognitive strategies in their lessons.

edTPA Planning and Instruction Commentaries

Because these preservice teachers learned about and worked on the edTPA for the first time in this literacy methods course, they completed only the first two tasks in this study: Task 1 Planning and Task 2 Instruction on the edTPA. For Task 1, after they developed their two literacy lesson plans, they wrote a planning commentary. The planning commentary included five sections: (1) central focus, (2) knowledge of students to inform teaching, (3) supporting students' literacy learning, (4) supporting literacy development through language, and (5) monitoring student learning. Additionally, these preservice teachers wrote about the metacognitive strategies they included in their lesson plans, why they selected these strategies, and how they think these strategies would support learning for all students, including diverse learners.

For Task 2, they taught these lessons in their field experience classrooms and videotaped their teaching. After delivering lessons, they watched their video clips and reflected on their teaching. Per the directions of the edTPA elementary literacy handbook, the guideline used to complete the elementary literacy edTPA, preservice teachers in this study selected two video clips (no more than 20 minutes in total) and completed their edTPA instruction commentary. The instruction commentary consisted of five sections: (1) identifying lesson plan(s) included in the video clips, (2) promoting a positive learning environment, (3) engaging students in learning, (4) deepening student learning during instruction, and (5) analyzing teaching. In writing, they reflected on their uses of metacognitive strategies and how effectively or not effectively their selected metacognitive strategies worked for all students including diverse students. They also wrote their comments on using metacognitive strategies in the future.

Data analysis

The researcher quantified data from the pre- and post-surveys by computing the mean of each subset of questions relating to awareness, knowledge, and skills for both pre- and post-scores and then conducting paired t-tests to determine if differences exist between population means for pre- and post-scores at a 5% level of significance. Statistical tests were performed using SPSS version 25. For qualitative data, the researcher used a content analysis technique, which is designed to discover the underlying meanings of the text or content (Morse & Field, 1995; Renz, Carrington, & Badger, 2018). Using the qualitative data from the pre- and post-surveys, literacy lesson plans, and planning and instruction commentaries, the researcher first organized the data. She read preservice teachers' comments and responses multiple times until she understood each of her student's experiences, analyses, and reflections. Next, she used coding by

searching for occurrences of key words and phrases from their responses. To determine the reliability of the qualitative data analysis (i.e., consistency of text evidence with interpretation) (Weber, 1990), the researcher used the key words and phrases that she had identified from the edTPA elementary literacy handbook, which was carefully developed by educational experts such as the SCALE. Then she looked for emergent themes based on the coding results to synthesize collective trends and characteristics in their responses in the surveys, lesson plans, and edTPA commentaries.

Findings

Four-Point Scale Survey Results

In the second part of the pre- and post-surveys, preservice teachers reported, using the four-point scale, their awareness, knowledge, and skills to teach metacognitive strategies and literacy across the curriculum for all students including diverse students. The results illustrated (Table 1) that preservice teachers significantly increased their awareness ($P = 0.001$), knowledge ($P = 0.002$), and skills ($P < 0.0005$) to teach metacognitive strategies and literacy across the curriculum for all students. The normality condition for each paired t-tests and confidence intervals was evaluated and deemed satisfactory for inference. Comparison of pre- and post-scales on metacognitive strategies and literacy is also included (Table 2).

Regarding the area of "awareness," their average pre-score for using metacognitive strategies, teaching for all students, and integrating literacy across the curriculum was 3.37. Their post-score average increased to 3.81. With 95% confidence, the increase in the population mean score for the combined "awareness" items is between 0.22 and 0.67 points on the 4-point scale. Regarding the area of "knowledge," their mean score for using metacognitive strategies, teaching for all students, and integrating literacy across the curriculum increased from 2.74. to 3.31, indicating an overall increase in the population mean of 0.25 to 0.89 points for the knowledge items at 95% confidence. Regarding "skills and preparedness to teach," preservice teachers' mean scores for using metacognitive strategies, teaching for all students, and integrating literacy across the curriculum increased from 2.54 to 3.26. Thus, it can be concluded at the 95% level of confidence that the population mean for the skills items increased by between 0.40 and 1.04 points on the 4-point scale.

Themes

The researcher examined preservice teachers' responses on open-ended questions from the pre- and post-surveys, lesson plans, and edTPA planning and instruction commentaries to understand their planning, implementation, and analyses of the uses of metacognitive strategies in their teaching in field experience classrooms. Three main themes emerged from their responses. Preservice teachers: (1) carefully planned and used metacognitive strategies based on students' needs and lesson objectives; (2) criti-

cally reflected on their planning to use and instruction of metacognitive strategies; and (3) developed awareness, knowledge, and skills to teach metacognitive strategies (see Table 3).

Planned and used metacognitive strategies based on diverse students' needs and lesson objectives

When preservice teachers planned two literacy lesson plans for elementary school students in their field classrooms, they carefully considered some elements. Thirteen preservice teachers reported that they considered students' backgrounds and/or lesson objectives and incorporated specific metacognitive strategies in their lesson plans. First, they studied their students' backgrounds in their field experience classrooms and determined the metacognitive strategies appropriate for them. For example, one preservice teacher taught reading comprehension lessons focusing on understanding main ideas from a story and sequencing of the events in the story. In her second-grade field experience classroom, the student population included three English language learners, one student with an Individualized Education Plan (IEP), one gifted student, and two students with other special needs. She selected "questioning" as an appropriate metacognitive strategy for her lessons. She wrote:

> *The reason I chose questioning is because it can help both struggling and advanced students at the same time. It can help struggling students work through their confusions, and it can challenge advanced students to think through why they did what they did.*

Another preservice teacher focused on teaching "cause and effect" to second graders in her field experience classroom. She provided guided reading organizers for students to use while reading the text in her lesson. She planned these organizers because she thought they would help students:

> *get ideas down in the correct places before they keep on reading and forget their original thought. This also sort of forces students to stop and think about what they just read. This will allow them to recognize if they are comprehending the text or not.*

Second, preservice teachers developed their lessons and selected and used metacognitive strategies that would help students achieve lesson objectives. For example, one preservice teacher planned lessons on nonfiction summaries for fourth graders. She wrote for one of her lesson objectives: "Students will be able to write a nonfiction summary." She used a graphic organizer as one of her metacognitive strategies in her lesson. She wrote:

> *Providing an organizer for jotting down ideas before writing allows students to look at what they think is important, but gives them the ability to change their mind about an idea without having to start completely over on a new summary. It also allows them to see what they know and*

> *have completed so far, and what needs to be found. Providing the organizer for students also breaks down the paragraph structure so that students are able to see each component that goes into writing a strong summary.*

Critically reflected on preservice teachers' planning and instruction of metacognitive strategies

A second theme emerged from preservice teachers' writings and responses; they critically analyzed and reflected on their planning and instruction that included metacognitive strategies. After they taught and videotaped their lessons in their field experience classrooms, they watched the video clips and reflected on their teaching. Collectively analysing all preservice teachers' writings and qualitative responses, the researcher concluded that: (1) based on students' positive responses to instruction, their instruction using metacognitive strategies was effective; (2) their instruction using metacognitive strategies could have been improved; and (3) they plan to use metacognitive strategies in future teaching.

First, using metacognitive strategies, preservice teachers reflected on their teaching and analyzed the success of their lessons using the edTPA instruction commentary as a guide. Twelve preservice teachers reported that their selection and instruction of metacognitive strategies proved effective. For example, one preservice teacher taught her lesson using a think-aloud strategy with second graders. She reflected on her implementation of this strategy as follows:

> *This [think-aloud strategy] was effective for all students in the classroom be cause it gave them a chance to hear someone else's thoughts while also coming up with their own. It also gave them an opportunity to recognize their own levels of comprehension based on the answers they were able to come up with from the questions I asked.*

Another preservice teacher in her fourth-grade classroom used modeling to demonstrate how to closely preread a paragraph for repeated words or phrases to identify a main idea and supporting details. She analyzed that this *"previewing of material helped students break down the steps and thoughts when detecting a main idea and supporting details."* She reported that it was evidenced that *"This modeling activity increased students' understanding of the process of detecting the main idea and supporting details."*

Another preservice teacher in her first-grade classroom shared that she used activating students' background knowledge as one of her metacognitive strategies for her reading comprehension lesson focusing on sequencing. She reflected:

> *I activated the students' prior knowledge by asking students if they remebered what happened at a specific point in the story. This got them thinking about what they had read the day before, which would help them*

with remembering the order of events later on in the story.

Another preservice teacher developed third-grade writing lessons focusing on "elaboration of words in sentences." She set an objective for students to use strong descriptive adjectives, nouns, or verbs to elaborate their sentences. She analyzed that her use of the self-reflection strategy worked effectively. She noted that this strategy:

> *allowed students to see their own work and direct what they need to change, but also what they wanted to add to their own work. Having the ability to self-reflect allowed them to see what they could do better in their sentences and how they can fix it.*

Second, while preservice teachers shared that their selections and uses of metacognitive strategies worked effectively and that students responded positively to their instruction, some preservice teachers reported that they could have improved their uses of metacognitive strategies or could have selected different metacognitive strategies based on the students' responses. For example, a preservice teacher in a fourth-grade classroom taught on the topic of nonfiction summaries. She taught how to identify a main idea and supporting details in a nonfiction story as well as how to summarize a nonfiction story. She analyzed that her model and think-aloud worked well when teaching how to find supporting details. However, she identified these metacognitive strategies did not work well for teaching a main idea. She further analyzed that this resulted because students did not see her model and think-aloud as many times as they did for finding supporting ideas. She wrote:

> *This [using modeling and think-aloud strategies] was successful for finding supporting details throughout various texts, but did not work as well as I thought itwould for coming up with a main idea…I think that the main idea did not work as well because they did not have as many examples of finding main ideas; whereas for supporting detail, there were three times we practiced and within those three times heard at least three examples of what a supporting detail could be.*

Another preservice teacher taught lessons on the topic of reading for the gist (i.e., determining main idea and supporting details) to fourth graders. She used the note-taking strategy to help her students think comprehensively about the reading. While this effectively worked for advanced readers, it did not work for struggling readers as she had planned. Reflecting on struggling readers' reactions to her lesson, she wrote:

> *In the future, I would have example notes and take notes on a reading we did as an entire class. I would read an article that was about the same length as the students read, and I would take notes throughout while having students mimic my actions. I think this would have helped demonstrate to the students how they should take notes on non-fiction writing.*

She identified other ways to use metacognitive strategies in her lesson based on her students' reactions.

Third, eleven preservice teachers reported that they plan to use metacognitive strategies in their future teaching.

> *• In my future teaching, I plan to use taking-notes [strategy]. Having a notebook with key facts and concepts is a lot easier than having multiple worksheets that are more easily lost than a notebook. Discussing what we went over worked very well and my students appreciated going over the answers together.*
>
> *• I would like to use more metacognitive strategies in my future teaching. They are helpful for students to learn more independently. They don't need to rely on the teacher completely, because the strategies help them think on their own.*
>
> *• Metacognitive strategies are very useful in literacy lessons because it gets students thinking in a different type of way and can help them understand information. Teachers definitely have to use the right strategy at the right time for it to be successful, though. I would definitely use the questioning strategy again…to make sure students can be successful when using it.*

Not only do these comments show preservice teachers want to improve, but in their reflections, they also show a deeper understanding of what proved successful or otherwise, and why. In particular, the last comment clearly indicates that a preservice teacher identified the importance of using an appropriate metacognitive strategy at an appropriate time (i.e., conditional knowledge).

Developed awareness, knowledge, and skills to teach metacognitive strategies

Throughout the semester, preservice teachers developed awareness, knowledge, and skills to teach metacognitive strategies while working in their field experience classrooms and on the edTPA. Regarding end-of-semester awareness of using metacognitive strategies, 12 preservice teachers shared that using these strategies is very important, and five preservice teachers concluded they are very effective strategies. One preservice teacher concluded that it is "necessary" to use metacognitive strategies in teaching. One sample comment illustrates development:

> *I think using metacognitive strategies in teaching is important because all students learn differently. Some are able to learn best by doing silent work, but others may need to verbally explain their thinking for it to make sense to them. Metacognitive strategies can also promote problem-solving skills, so students become more independent learners.*

As presented in the earlier section, quantitative results on preservice teachers' "awareness" of using metacognitive strategies from the pre- and post-surveys (i.e.,

mean of pre-scores 3.4 against a mean of post scores 3.8) also support this qualitative finding.

The researcher concluded that preservice teachers developed knowledge of metacognitive strategies. At the beginning of the semester, when they were asked to define metacognitive strategies, three said: *"I don't know about these strategies."* Four preservice teachers provided responses unrelated to the prompt; six preservice teachers provided very general responses. These preservice teachers commented that metacognitive strategies were helpful strategies. Three responses were appropriate ones that included key elements of metacognition in literacy. Another two preservice teachers initially shared that metacognitive strategies are used to support only diverse learners or students with special needs. However, at the end of the semester, 13 preservice teachers described metacognitive strategies appropriately, while four respondents provided only general descriptions.

When preservice teachers were asked, at the beginning of the semester, to give examples of metacognitive strategies, 10 of them could not identify any metacognitive strategies. Most responses were *"I don't know."* On the other hand, at the end of the semester, all 18 preservice teachers described specific examples of metacognitive strategies. They comprehensively described "questioning," "monitoring," "think-aloud," "think like an author," and "overviewing information in a text."

As for end-of-semester skills and preparedness in the use of metacognitive strategies, preservice teachers shared that they felt prepared to incorporate these strategies in their teaching. One preservice teacher commented: *"I am much more comfortable with using metacognitive strategies and have learned many different ways to do this. It is very effective in the classroom, and I will be sure to use it across subjects."* Another preservice teacher wrote, *"I feel more prepared to use metacognitive strategies, and I feel more knowledgeable about the different kinds of strategies available."* Not only did preservice teachers comment on their increased skills to implement metacognitive strategies, but they also commented, within the edTPA framework, that they improved their skills to use these strategies. Other preservice teachers shared the following responses: *"I think I am better prepared to teach literacy because I have had an opportunity to implement engaging lesson plans and encourage students to use metacognitive strategies to enhance their own reading while working on the edTPA.";and "Working on the edTPA helped me realize how important it is to include multiple types of metacognitive strategies in each lesson so students have many opportunities to work through their own thought processes of the lesson."*

Table 1.
Pre- and Post-Surveys on Metacognitive Strategies and Literacy

	Pre-Survey		Post-Survey	
	Mean	SD	Mean	SD
Awareness of the importance of using metacognitive strategies	2.9	0.58	3.6	0.51
Awareness of the importance of teaching for all students	3.7	0.46	4.0	0.00
Awareness of the importance of integrating literacy across the curriculum	3.5	0.51	3.9	0.32
Knowledgeable of metacognitive strategies	2.2	0.43	3.1	0.58
Knowledgeable to teach for all students	3.0	0.69	3.3	0.49
Knowledgeable about integrating literacy across the curriculum	3.0	0.59	3.5	0.51
Skills to use metacognitive strategies	2.1	0.42	3.1	0.54
Skills to teach for all students	2.6	0.70	3.4	0.50
Skills to integrate literacy across the curriculum	2.9	0.64	3.3	0.49

Note: 1-strongly disagree; 2 – disagree; 3- agree; 4- strongly agree

Table 2.
Comparison of Pre- and Post-Scales on Metacognitive Strategies and Literacy

	Pre-Survey		Post-Survey		
	Mean	SD	Mean	SD	*P*-value
Awareness	3.4	0.36	3.8	0.23	0.01
Knowledge	2.7	0.39	3.3	0.45	0.02
Skills	2.5	0.44	3.3	0.42	<0.005

Note: 1-strongly disagree; 2 – disagree; 3- agree; 4- strongly agree

Table 3.
Emergent Themes of Preservice Teachers' Planning, Implementing, and Analysis of Uses of Metacognitive Strategies

Themes	Example Excerpts
Carefully planned and used metacognitive strategies based on students' needs and lesson objectives	"*The reason I chose questioning is because it can help both struggling and advanced students at the same time. It can help struggling students work through their confusions, and it can challenge advanced students to think through why they did what they did.*"
Critically reflected on their planning to use and instruction of metacognitive strategies	"*This [think-aloud strategy] was effective for all students in the classroom because it gave them a chance to hear someone else's thoughts while also coming up with their own. It also gave them an opportunity to recognize their own levels of comprehension based on the answers they were able to come up with from the questions I asked.*"
Developed awareness, knowledge, and skills to teach metacognitive strategies	"*Working on the edTPA helped me realize how important it is to include multiple types of metacognitive strategies in each lesson so students have many opportunities to work through their own thought processes of the lesson.*"

Discussion

The researcher examined preservice teachers' planning, instruction, and analyses of their uses of metacognitive strategies in their field experience classrooms using the elementary literacy edTPA work. Discussion is organized based on the three research questions foundational for this study.

1. How do preservice teachers plan and apply metacognitive strategies in their field lessons using the elementary literacy edTPA?

Preservice teachers carefully selected metacognitive strategies in the literacy lessons they used in their field experience classrooms. They learned about their students' backgrounds and what kinds of learners they were, and then they selected appropriate

metacognitive strategies appropriate for them. Using the edTPA, preservice teachers needed to complete the "context for learning" document. To complete this document, preservice teachers learned about the students in their field classrooms. For instance, they identified English language learners, students with IEPs, and accommodations offered to students. Teachers must know their students so they can provide best practices (Powell & Kusuma-Powell, 2011). The edTPA framework helped preservice teachers to know their students and to plan their lessons accordingly.

Preservice teachers also based their decisions to use metacognitive strategies on their lesson objectives. They first looked at what they wanted students to learn by the end of the lesson, and identified objectives based on that. Then, they purposefully selected specific metacognitive strategies so students could meet the lesson objectives. As part of their lesson plans, they also developed assessment tools, such as rubrics or checklists. Therefore, backward planning helped preservice teachers plan the measurement of students' outcomes. A backward design serves as a critical element in developing lesson plans. It focuses on students' outcomes first and then develops and selects text, materials, and appropriate strategies to help students to achieve the outcomes. Wiggins and McTighe (2005) argue that "lessons, units, courses should be logically inferred from the results sought, not derived from the methods, books, or activities with which we are most comfortable…the best designs derive backward from the learnings sought" (p.14). Preservice teachers in this study followed this backward design framework to select appropriate metacognitive strategies. Preservice teachers used various metacognitive strategies in their literacy lessons in their field experience classrooms. Some examples were think-aloud, modeling, previewing text, questioning, note-taking, making prediction, self-reflection, using context clues, and activating background knowledge.

2. How do preservice teachers analyze their implementation of metacognitive strategies using the elementary literacy edTPA?

Preservice teachers critically and professionally analyzed their uses of metacognitive strategies. Overall, they reflected that their selections and implementations of metacognitive strategies worked effectively because their students responded positively to their teaching. They carefully planned their lessons and selected effective metacognitive strategies. By selecting appropriate strategies to accommodate students' learning styles, needs, and outcomes, the preservice teachers maximized student learning. The edTPA required preservice teachers to plan their lessons critically and professionally. Along with their lesson plans, they also completed their edTPA Task 1 planning commentary in which they described the rationale for selecting instruction and assessment based on the main focus of the lessons. Working on the edTPA assisted preservice teachers to plan and select instruction purposefully.

Preservice teachers also analyzed that some of their instruction using metacogni-

tive strategies could have been improved or selected differently because not all students responded to their teaching in the ways they had planned. Teaching is also a learning process. Teachers need to respond to students' responses, such as the need to reteach concepts before introducing a new concept, breaking down instruction into smaller steps, selecting different strategies to complete tasks, or describing concepts differently (rephrasing, using visual aids) -- even in the middle of their lessons. In this study, several preservice teachers discovered why their selected metacognitive strategies did not work effectively for certain groups of students (e.g., struggling learners) and benefited from the opportunity to think about how to improve their teaching in the future. This was a valuable learning experience in their quest to become better teachers.

Lastly, preservice teachers indicated that they plan to use metacognitive strategies in their future teaching. The fact that preservice teachers in this study experienced a positive reaction to the use of metacognitive strategies and planned to implement these strategies in their future teaching offers a promise for three reasons. First, metacognitive strategies are evidence-based strategies (e.g., Baker & Beall, 2009). Second, students can learn metacognitive strategies and perform well if they use metacognitive strategies (Boulware-Gooden, Carreker, Thornhill, & Joshi, 2007; Pressley & Gaskins, 2006; van Blerkom & van Blerkom, 2004; Cubukcu, 2008). Third, advanced students can effectively use metacognitive strategies, so they grow academically (Dogany & Ozden, 2011; Maasum & Maarof, 2012). As the post-survey results revealed, preservice teachers also reported that they plan to integrate literacy across the curriculum and teach to all students, including diverse learners. When they integrate literacy in different subjects and strive to teach for all students using these research-based metacognitive strategies, they comprehensively support student learning.

3. What is the influence of preservice teachers' planning, applying, and analyzing their lessons and teaching through the elementary literacy edTPA with regard to metacognitive strategies?

After learning about metacognitive strategies and completing the edTPA work in this literacy methods course, preservice teachers realized the importance of using metacognitive strategies in their teaching and across all subjects for all students. They developed their knowledge of metacognitive strategies by learning about and practising these strategies in a literacy methods course and in related field classrooms where they taught lessons using metacognitive strategies. At the end of the semester, they felt they were prepared to use metacognitive strategies in their teaching. The edTPA tasks assisted these preservice teachers to become more critical of and reflective during planning, instruction, and analysis of lessons because the tasks/prompts in the edTPA commentaries required them to think critically about their reasoning for planning and to analyze their instruction as evidenced in the video clips.

In summary, findings of this research demonstrate a significant role in understanding the experiences of preservice teachers' lesson planning, teaching, and reflecting on their uses of metacognitive strategies through the edTPA, a performance-based assessment. The researcher used the edTPA because it provides a foundation and framework for effective teaching and for teaching readiness on the first day of their teaching as professionals (Rosenberg & Walther-Thomas, 2014; SCALE, 2013). Engaging in performance-based assessments helps both experienced and novice teachers develop their practices (Darling-Hammond, 2010). edTPA offers preservice teachers opportunities to methodically apply targeted pedagogical strategies (i.e., metacognitive strategies in this study) to plan and teach lessons and reflect on their experiences. This helps them improve their practices and readiness to teach effectively on the first day of their professional assignment in schools. Especially, with the growing population of diverse students in schools and the demand to meet higher standards in all subjects, new and experienced teachers must demonstrate high-level, effective teaching skills (SCALE, 2013).

Teacher educators in the teacher preparation program must embed this kind of performance-based assessment in their curriculum -- not just during student teaching, but in all education courses throughout the teacher preparation program. Preservice teachers need to continuously practice and develop their content and pedagogical knowledge and skills to prepare to apply them in their future classrooms. This will lead them to further develop their professional competencies (Lalor, Lorenzi, & Rami, 2014). edTPA is one of the assessment tools to support this process to prepare teachers who are equipped with a wide range of effective strategies.

Conclusion

The researcher examined 18 preservice teachers' planning for, teaching with, and analyses of their uses of metacognitive strategies in their field classrooms at assigned elementary schools using the edTPA literacy handbook. After they learned about metacognitive strategies, they were able to select appropriate metacognitive strategies and to plan their literacy lessons to meet lesson objectives and accommodate students' needs; they included various types of metacognitive strategies (e.g., think-aloud, previewing text, and questioning) in their teaching. They analyzed data and concluded that they effectively used these strategies in their teaching. Their awareness of using metacognitive strategies, knowledge of these strategies, and abilities to teach using these strategies increased over the semester. Even more importantly, preservice teachers indicated they plan to use metacognitive strategies. Such use will positively influence their future teaching outcomes because they will incorporate evidence-based, effective strategies, which will help their students become strategic learners. Reflection is the key element for teacher education and teaching (Postlethwaite, & Haggarty, 2012). Teacher educators must emphasize this reflective element across the teacher

education curriculum.

The researcher focused on two tasks of planning and instruction commentaries from the edTPA elementary literacy work. A recommendation for future research is to include the third task of the assessment commentary from the edTPA and to examine how preservice teachers collect student sample work to document their understandings and how their students effectively used metacognitive strategies.

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