

## **Exploring the Influence of Accomplished Teachers' Video and Commentary Pairing on Teacher Candidates' Noticing and Thinking about Practice**

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Teacher preparation programs are facing increased demands to link pre-service teachers to expert teachers. Literature has highlighted that utilizing accomplished teacher videos has the potential to buttress pre-service teachers' professional learning. Over the last decade, several platforms have been developed that offer expert teacher videos and provide windows into expert practice. In general, though, the current video-based systems are limited because they do not shed light on the teacher's thinking, planning, analysis, and reflection from the accompanying video. This article examines the efficacy of

a platform that brings forward accomplished teachers' thinking alongside their videos. The empirical evidence from this study indicated that, from the pre-service teachers' perspective, the pairing of video and commentary helped them unpack the complexities of decision-making that accomplished teachers engage in when they plan, teach, and reflect on practice.

**Keywords:** pre-service teachers, video analysis, noticing

## INTRODUCTION

Teacher educators have integrated P-12 teaching videos into their teacher preparation coursework for more than four decades. Videos help to orient pre-service teachers to the profession by providing a window into the classroom (Brouwer, 2011; Sherin, 2004). Videos enable teacher educators to engage teacher candidates in meaningful discussions based on shared viewing and reviewing of the same classroom experience (Santagata & Guarino, 2010; Lambdin, Duffy & Moore, 1997), and provide common opportunities to view innovative practices that might not be readily observable in field experience placements (Abell, Cennamo, Anderson, & Bryan, 1996; Wang & Hartley, 2003). A pressing concern with some video resources is that they do not allow teacher candidates to access the thinking and decision-making of the teacher being observed. The challenge, therefore, becomes how to engage teacher candidates with video resources that allow access to teachers' thinking and decision-making without interfering with authentic viewing of comprehensive instructional practices.

This article describes a study that addresses the above concern. One teacher education program explored the use of video cases of accomplished teachers and guided instructional practice with teacher candidates. ATLAS, which stands for Accomplished Teaching Learning and Schools, is a searchable online library of video cases exhibiting National Board Certified Teachers (NBCTs) delivering uninterrupted lesson segments to their P-12 students. Each video case includes written commentary describing the NBCT's instructional context, planning, analysis of practice, and reflection. It is the pairing of the uninterrupted video clip of classroom practice, along with the explicit description of instructional decision-making in the commentary that makes us interested in exploring how video cases from accomplished teachers can be productively used to develop *noticing* skills, and

advance the thinking and instructional decision-making of novices in pre-service teacher education.

### VIDEO ANALYSIS IN TEACHER EDUCATION

Video analysis has become a common strategy used by teacher educators in the development of teacher candidates (Johnson & Cotterman, 2015; Santagata & Guarino, 2010; Sherin, 2004). Video platforms such as TeacherTube and the Teaching Channel are often used in the early phases of teacher preparation to help pre-service candidates connect the theories they are learning in their program with visual representations of actual P-12 classroom practice. Teacher educators can use these videos to help teacher candidates unpack and analyze specific, critical practices because they can slow down, pause, and reflect upon the actions they are observing (Santagata, Zannoni & Stickler, 2007). A common concern with these platforms is that they do not allow teacher candidates to access the thinking and decision-making of the teacher being observed (Sherin, 2004). Teacher educators know that a great deal of the work of teaching happens within the mind of the teacher. Danielson (1996), for example, estimates that teachers make up to 3,000 non-trivial decisions every day. This thinking cannot be viewed merely in a video. While some teaching video resources embed oral teacher commentary within the video, this editorial choice often results in a disjointed viewing of the actual classroom experience. These platforms also typically present shortened clips of exemplary practice removed from the full context of the lesson. This spoken commentary may also make pedagogical thoughts explicit before teacher candidates can be challenged to look deeply and identify them on their own (van Es, 2009). From a practical perspective, these platforms require a great deal of trial and error exploration on the part of teacher educators trying to identify authentic video of accomplished teaching that illustrates the practices they seek to share with teacher candidates.

Later in the professional development trajectory, teacher candidates and novice teachers begin to use video for self-analysis and professional development of their own practice. Platforms like Edthena, Torsh Talent, and Vimeo are used to upload personal classroom videos for sharing. Typically, this use of video begins with a self-reflection, that is reviewed and enhanced by a teacher educator or mentor, and sometimes peer teacher candidates. Videos produced by teacher candidates are powerful for breaking down personal and peer practice to identify strengths and weaknesses, and to build

reflective practice skills. They are less likely to be powerful demonstrations of comprehensive professional practice.

The video viewing platforms described above offer teacher candidates the opportunity to present and reflect on effective and less effective practices. Generally, however, they do not provide easy searching systems that help teacher educators identify specific practices that have been evaluated as meeting standards of quality and effectiveness. Neither do they provide a comprehensive window into the classroom with clear information about the diversities, needs, individual differences, and assets of the students paired with descriptions of the lesson and assessments viewed in the video placed in the context of the larger scope of the sequence of an instructional unit. Additionally, they do not present comprehensive analysis of the decision-making of the teacher and the reflection of practice and impact on student learning.

The National Board for Professional Teaching Standards has addressed this challenge by making the submissions of recently recognized National Board Certified Teachers [NBCTs] available through ATLAS, an online searchable database (<https://atlas.nbpts.org>). National Board candidates prepare and submit portfolios that include a) video of the NBCT teaching in his/her classroom combined with b) a description of supporting instructional materials, and c) written commentary which serves to make explicit the intangible decisions and reflections of the NBCT related to planning, instruction, and assessment. Beyond the components of the cases, the value of this resource is enhanced by the quality of the content.

Teachers who are seeking National Board Certification are required to submit videos of their teaching accompanied by a written self-analysis of their practice (National Board for Professional Teaching Standards, 2014). Research of the impact of National Board Certified Teachers on student learning served as the foundation for the development of the Teacher Performance Assessment [edTPA]. The edTPA is now used with teacher candidates on over 750 campuses in 40 states and the District of Columbia (Pecheone & Whittaker, 2016), and 18 states require or are considering edTPA as part of statewide certification policy (SCALE, 2018). The consequential adoption of teacher performance assessments, like edTPA, has necessitated that teacher educators re-imagine how they prepare teacher candidates to think and communicate about their planning, teaching, and assessment. As part of the edTPA process, for example, teacher candidates submit video of their instruction along with a commentary that critically analyzes these aspects of their practice. In response, teacher educators are integrating more frequent and substantive video analysis opportunities for teacher candidates

to help them prepare to plan an instructional segment, videotape the teaching of this segment, and analyze the results (van Es, Cashen, Barnhart, & Auger, 2017; Barnhart & van Es, 2015; Johnson & Cotterman, 2015).

### **DEVELOPING NOTICING SKILLS THROUGH VIDEO ANALYSIS**

Learning how to analyze their classroom practice through video as a pre-service teacher is likely to position novice teachers to continue reflective growth and refinement of their practice over their careers (Schon, 1987; Zeichner & Liston, 1996). Recently, there has been an emphasis on teacher noticing when working with video (Sherin, Rich, & Colestock, 2008; van Es & Sherin, 2002; van Es et al., 2017; Russ, 2018). While much of this work has been done with in-service teachers, there is increasing interest in understanding how these noticing skills emerge and develop in pre-service teacher education programs (Star, Lynch, & Perova, 2011; Barnhart & van Es, 2015). Even though teacher candidates spend several hours in classrooms observing teachers and students, more frequent observations do not necessarily support teacher candidates in attending to important classroom events (Star, Lynch, & Perova, 2011).

The development of an individual's ability to use video recordings to inform their practice is a key theme in research on the use of video-based reflection in teacher education. For example, van Es and Sherin (2009) and Sherin, Linsenmeier, and van Es (2009) note that to develop 'noticing' abilities, teachers must be prepared to make connections between the specific examples they see and larger theoretical principles, as well as to their own classrooms and social contexts. In considering the role of technology in this process, Rosaen, Lundeberg, Cooper, Fritzen, and Terpstra (2011) observed that their teacher interns wrote more specific, instruction-oriented, and student-centered comments and reflections when they examined video representations of practice than when they tried to reflect from memory. Further, interns were able to use video-based reflection to unpack the complexities of their teaching practice in ways that were consistent with the important role of inductive and abductive reasoning to their noticings. In this sense, teacher candidates need support in developing a productive noticing lens (Sherin et al., 2008), a frame that will help them attend to important events that support student thinking, for example, that they can then apply to their nascent practice. Facilitated engagement with video in early coursework and field experiences could be a place for teacher candidates to start constructing a framework for noticing that will be developed and refined with more

observations of classroom practice - their own and others, in real time or through video.

To develop this noticing framework and apply their interpretations and responses to their noticings within their practice, however, teacher candidates need access to more than just video. Through video, they can observe behaviors of teachers and students, but they need information about the instructional context, the teacher's goals, and the teacher's rationale for certain decisions to help make sense of the classroom events. This need for context is one reason that Dymond and Bentz (2006) suggest that teacher educators need to examine whether the integration of video in teacher preparation programs results in improved practice by the teacher candidates who engage with them. The empirical literature on the value of engaging with video is limited and sometimes contradictory (Karpinnen, 2005; Schrader et al., 2003; Winitzky & Arends, 1991; Santagata, Zannoni, & Stigler, 2007). According to Boyle (1997), teacher educators should focus more on the learning activities that teacher candidates perform as they engage with the video. As with all educational innovations, teacher educators may need to determine if P-12 videos of classroom practice are simply novel instructional resources or if they can genuinely result in positive changes in the knowledge, skills, and dispositions of teacher candidates.

Accordingly, the challenge becomes how to engage teacher candidates with video resources that allow access to teachers' thinking and decision-making without interfering with authentic viewing of comprehensive instructional practices. In the last twenty-five years, more than 112,000 teachers representing all 50 states have achieved National Board Certification, and the research on the value of Board-certification is well-documented. Not only does the certification process support teacher retention and professional growth, NBCTs advance student achievement (Cavalluzzo, 2004; Darling-Hammond, 2003; Ingersoll, 2001; Lustick & Sykes, 2006; NRC, 2008). Students of Board-certified teachers outperform students of non-Board-certified teachers on achievement tests (Clotfelter, Ladd & Vigdor, 2007; Goldhaber & Anthony, 2007; NRC, 2008), making learning gains equivalent to an extra 1-2 months in school (Cowan & Goldhaber, 2015). Value-added scores for Board-certified teachers were found to be one-half of a standard deviation above their non-Board certified peers, rising to nearly one full standard deviation higher when combined with performance evaluation measures (NBPTS, 2012). For students from minority and low-income backgrounds the impact of having a Board-certified teacher is even higher (Cavalluzzo, Barrow, Henderson, Mokher, Geraghty, & Sartain, 2014; Goldhaber & Anthony, 2007).

Berliner (1994, 2001) would suggest that accomplished or expert teachers have more advanced understandings of classroom teaching and learning. Their more fully developed schemata have elaborate interconnections, while teacher candidates and novice teachers have less developed teaching and learning schemata, gained mainly from their personal experiences as students. Berliner also suggests that objective criteria for the identification of “expert” teachers are lacking in the research. Years of service or recommendations of supervisors/colleagues do not necessarily indicate that the teacher is an expert. Bond, Smith, Baker, and Hattie (2000) examined the validity of the National Board Certification process and determined that teachers who were board certified demonstrated significantly better practices and student outcomes than non-board certified teachers with the same levels of teaching experience. Board certification, therefore, can be seen as a valid measure of expertise. Furthermore, with the added commentary within an ATLAS case, decision-making from these accomplished teachers is made explicit, a resource that is rarely accessible to teacher candidates.

## RESEARCH QUESTIONS

Based on the gaps identified in the literature on the use of video in novice teacher training, this study was designed to explore the following research questions:

1. What are teacher candidates' perceptions of ATLAS's influence on their thinking about planning, instruction, and assessment?
2. In what ways, if at all, does the ATLAS written commentary help teacher candidates attend to and reason through important events within classroom activity?

## STUDY DESIGN AND METHODS

This mixed methods study approached the research questions using a convergent design. The convergent design was useful in triangulating the methods by “directly comparing and contrasting quantitative statistical results with qualitative findings” to best understand the research questions (Creswell & Plano Clark, 2011, p. 77). In this design, the quantitative and qualitative data that was concurrently collected in an online student perception survey and subsequently analyzed provided a fuller understanding of the phenomenon of interest - how interaction with expert video cases influences pre-service teacher thinking about their practice.

The evidence collected informed a fuller understanding of the practice of engaging with accomplished teacher video and teacher commentary, coupled with guided instructional practice, on teacher candidates' thinking about planning, instruction, and assessment. According to the National Board for Professional Teaching Standards, accomplished teachers are committed to their students and their learning; they know the subjects they teach and how to teach those subjects to students; they are responsible for managing and monitoring student learning; they think systematically about their practice and learn from experience; and are members of learning communities (National Board for Professional Teaching Standards, 2014). The edTPA rubric language on planning, instruction, and assessment were used to provide conceptual boundaries around these constructs. Borrowing the edTPA rubric language provided two additional affordances. For one, teacher candidates were familiar with the edTPA rubric language. Another benefit was that when surveyed, teacher candidates could identify where ATLAS was influential in their thinking concerning particular areas (rubrics) within these constructs of planning, instruction, and assessment. Focusing on these three constructs, already affirmed by the research on the edTPA, bolsters the validity of this approach.

### **Intervention: Tool and Facilitation**

The study's intervention consisted of the ATLAS tool itself, as a video-based platform with teacher commentary, and instructor-led inquiry cycles (guided facilitation) as a means of guiding teacher candidates' interaction with ATLAS. The teacher educator identified a problem of practice to motivate teacher candidates' engagement with the case. Next, the teacher candidates viewed an ATLAS video clip, read the accompanying commentary, and analyzed the case concerning the problem of practice with their peers (see Figure 1). They concluded with a reflection on their practice to consider how they could adapt what they discussed for their contexts. Different cases were selected to highlight various problems of practice: planning, leveraging student thinking in instruction, formative assessment, and establishing and sustaining a rigorous and equitable learning environment. Each case interaction included both engagement with the video clip as well as the teacher commentary.



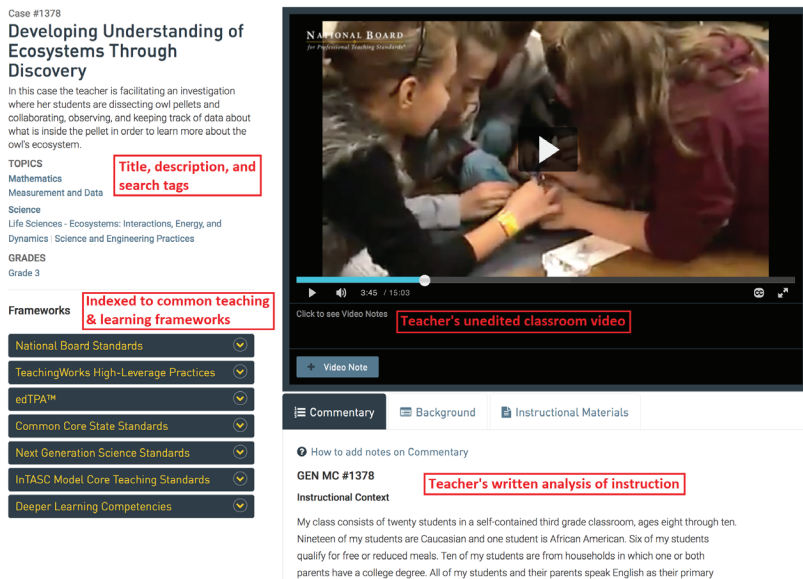


Figure 1. Image of ATLAS platform. The image includes annotations of key features mentioned in this study.

### Settings, Participants, and Timing

This study was situated in a large, traditional teacher preparation program at a land-grant state university, located in the Pacific Northwest (PNW Institution). This university graduates over 400 teacher candidates per year. A purposeful and convenience sample of 64 teacher candidates was identified (see Table 1 for additional participant description and demographics). These 64 teacher candidates were explicitly selected because, at the time, they were the only teacher candidates exposed to ATLAS and were in the early stage of their teacher preparation.

**Table 1**

## Description of Participants and ATLAS Interactions for PNW Institution

<b>Description of participants</b>	64 elementary education majors in their 1st quarter of their teacher education preparation program 61 undergraduates (juniors) 3 Post Baccalaureate 47 were enrolled in three teacher education courses (Assessment, Seminar, and Methods of Instruction), and 17 were enrolled in only two of these teacher education courses The courses were taught by the same tenure-track education professor The four courses used ATLAS as an instructional tool
<b>Demographics</b>	12 Males (19%), 52 Females (81%); Race/ethnicity (federal categories): American Indian - 1 Asian - 3 Black - 5 Hispanic - 6 Other Pacific Islander - 1 White - 48
<b>ATLAS interactions</b>	On average, participants engaged in six ATLAS interactions in various courses.

The teacher candidates interacted with ATLAS inside and outside the classroom. An example of an ATLAS activity was in the Assessment course. For this ATLAS interaction, teacher candidates -- outside of classroom time -- viewed an ATLAS video and read the commentary with the goal of identifying ways the NBCT employed various assessments, analyzed student work, and reflected on the outcomes. The teacher candidates returned to the next class ready to report out findings to their peers, which was followed by a whole class discussion facilitated by the teacher education professor.


At the time of the study, Fall 2015, teacher candidates were in their first quarter of their teacher education program and had interacted with ATLAS in two to four different education courses. Data collection was limited to that fall quarter.

## Survey Design

An online survey was conducted to gather quantitative and qualitative evidence using a standardized participant perception survey. Specifically, the survey was designed to measure teacher candidates' perceptions of how helpful the ATLAS activities were in shaping their thinking about planning, instruction, and assessment. As part of the design process of the survey instrument, it was first piloted in the previous academic quarter (Spring 2015) with other teacher candidates who had similar interactions with ATLAS cases. The pilot survey was administered to a class of 25 teacher candidates using a round of cognitive, think-out-loud interview questions. The pilot questions aimed to address any ambiguity of wording and confusion in the response form, and ensured questions meant the same thing to all participants (Fowler, 2009). Also, the think-out-loud interview allowed for suggestions for improvement. These efforts improved the validity and reliability of the survey instrument (Creswell & Plano Clark, 2011). The survey was designed around three core constructs (Planning, Instruction, and Assessment) that are key to success on the edTPA, and teaching in general.

An online perception survey, using Qualtrics software, was emailed to the sample frame of 64 teacher candidates. Their responses were confidential, and non-responders were emailed a second time. The final response rate was 67% with 43 participants completing the survey. The survey had 11 items (See Appendix A to view items). The first part of the survey (items 1-2) collected participants' experience with ATLAS, inquiring what courses they had used ATLAS, and the extent to which they used ATLAS in class and on their own (not directly linked to any course requirement). The second part of the survey collected quantitative perception data (items 3-8). The format was familiar to the participants because it was adapted from the PNW institution's end-of-course evaluations using a five-point continuum scale, ranging from "1 -No effect" to "5 - Major effect". Figure 2 illustrates a sample question as represented in Qualtrics.

Q2 To what extent were the ATLAS activities, from this quarter, helpful in your **thinking about teacher PLANNING** (supporting learning needs, using knowledge of students, etc.).




1 - No effect      2 - Minor effect      3 - Neutral      4 - Moderate effect      5 - Major effect

Figure 2. Sample close-ended survey question.

Applying skip logic, if a participant selected that the ATLAS activities (intervention) were helpful in their thinking by selecting “4 - Moderate effect” or “5 - Major effect”, then a follow-up question appeared asking the teacher candidate to specify the areas (using the edTPA rubric language) where ATLAS was most helpful (see Figure 3). These areas served as binary subitems in the scale (selected or unselected).

Q3 Identify any specific areas that ATLAS was helpful in shaping your thinking.

  Building Content Understanding

Supporting Learning Needs

Using Knowledge of Students

Assessments to Monitor Student Learning

**Figure 3.** Sample follow-up question on a specific area that ATLAS was helpful in teacher candidate thinking.

At the end of the survey, participants provided qualitative perception data (items 9-11) by responding to a particular ATLAS experience that was useful and detailing the reasons the ATLAS experience was useful. Another open-ended question inquired about changes, if any, in the teacher candidates’ thinking that occurred from interacting with ATLAS. The final survey item was optional and asked participants if there was anything they would like to mention about their ATLAS experience beyond the scope of the questionnaire.

## Data Analysis

The survey design yielded two datasets concurrently: quantitative and qualitative data. Initially, the data analysis of the two datasets was independently analyzed, and then the analysis was compared to develop a broader understanding of the research questions. To explain the quantitative perception data, descriptive analysis, using SPSS software (version 23), was conducted to determine mean, standard deviation, and variance (See Table 2 for the results).

**Table 2**  
A Descriptive Analysis of Survey Results at the Category Level

	<u>N</u>	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
To what extent were the ATLAS activities, from this quarter, helpful in your thinking about <b>teacher planning</b>	43	4.63	.48	.24
To what extent were the ATLAS activities, from this quarter, helpful in your thinking about <b>teacher instruction</b>	43	4.56	.59	.35
To what extent were the ATLAS activities, from this quarter, helpful in your thinking about <b>teacher assessment</b>	43	4.51	.59	.35

Responses to the main category items in the survey data (Teacher Planning, Teacher Instruction, and Teacher Assessment) were assessed using three statistical tests. First, the data were screened to ensure that the respondents provided answers to all questions; in the final data set, 43 respondents answered all of the questions, and missing data were excluded casewise in further analysis. As a result of the skip logic employed in the survey, participants who did not respond to the questions on the three main categories also did not provide responses to subitems. Second, the Likert scale data were assessed for normality. As a result of the five-point Likert scale used, nearly all responses clustered between the “Minor Effect” (4) and “Major Effect” (5), with 39 of 41 respondents using either of these two responses for each question, and two students responding with “Neutral” (3). This caused response means to skew toward the high end of the scale, between 4.51 and 4.63. This indicates a high degree of favorable opinion toward ATLAS amongst the students, but also indicates that statistical tests based on normal distribution would not yield further insights. Finally, the reliability of student responses was assessed by means of Cronbach’s Alpha ( $=.67$  for the three items), indicating internal consistency and reliability in students’ responses to the items.

Drilling down further into the individual responses, Table 3 presents a summary of the disaggregated responses from each of the respondents to the main category questions represented in Table 2. Little variation is seen amongst the responses, with most students selecting either a 4 or 5 on the scale.

**Table 3***A Summary of Responses by Category and Likert Rating*

	N	Responses		
		<u>3 – Neutral</u>	<u>4 – Minor Effect</u>	<u>5 – Major Effect</u>
<b>Planning</b>	43	0	16	27
<b>Instruction</b>	43	2	15	26
<b>Assessment</b>	43	2	17	24

Next, for students who responded with a rating of 4 or 5, a cross-tab analysis was employed to identify some of the specific ways that ATLAS was helpful to students. Table 4 presents a summary of student responses to specific uses of the system in each of the three main categories used in the survey scale (Planning, Instruction, and Assessment) as a count and a percentage, and in the order presented by the survey. Each category and subitem was considered to be independent, as they are binary measures (selected or not selected) drawn from an existing validated instrument (the edTPA). Of the 43 respondents who saw these questions, students chose “using knowledge of students” (73%) and “assessments to monitor student learning” (86%) most frequently in the Planning category. In the Instruction category “engagement in learning” (75%) and “analyzing teaching effectiveness” (77%) were selected most frequently. In the Assessment category, “analysis of student learning” (77%) and “using assessment to inform instruction” received the most responses. Across all categories, the items with the lowest percentages of responses included “supporting students’ use of feedback” (48%), “providing feedback” (54%), and “supporting learning needs” (57%).

**Table 4**

Summary of Teacher Candidate-Reported Ways That ATLAS Supported Their Thinking

		Respondents (n=43)	Percentage
<b>Planning</b>			
	Building Content Understanding	29	66%
	Supporting Learning Needs	25	57%
	Using Knowledge of Students	32	73%

	Assessments to Monitor Student Learning	38	86%
<b>Instruction</b>			
	Learning Environment	32	73%
	Engagement in Learning	33	75%
	Deepening Thinking	31	71%
	Analyzing Teaching Effectiveness	34	77%
<b>Assessment</b>			
	Analysis of Student Learning	34	77%
	Providing Feedback	24	54%
	Supporting Students' Use of Feedback	21	48%
	Using Assessment to Inform Instruction	38	86%

The qualitative, open-ended items (10, 11, and 12) had the following number of comments recorded, respectively: 27, 26, and 12. Item 12 had a lower response rate since it was marked optional. In analyzing the qualitative data, the open-ended responses were reiteratively read in their entirety, which “encouraged recognizing patterns and making comparisons” (Emerson, Fretz, & Shaw, 1995, p. 145). Comments were coded based on the following analytic categories of “planning,” “instruction,” “assessment,” and “reflection.” Secondly, comments were reviewed and coded with another set of a priori codes tied to the language of the edTPA rubrics, including “using student knowledge” (Rubric 3), “engagement” (Rubric 7), and “providing feedback” (Rubric 12). Next, emergent themes were identified through open coding. For example, an analytical code was developed to capture students’ responses regarding the “hidden work of teachers” through this process. Subsequently, the data analysis combined a priori and open codes, furthering the process of making sense of the data. For example, when asked ‘what changes in your thinking about teaching occurred from interacting with ATLAS’, one student’s survey response was: “I have learned that teaching is not as easy as it looks and that it’s really important to keep learning [how to] engage students.” For this response, a priori codes of “instruction” and “engagement” were applied, with an open code for “hidden work of teachers.” The teacher candidate’s response suggests that the ATLAS interactions prompted the teacher candidate’s thinking in a few ways; first, teaching requires considerably more teacher effort than previously understood, and second, it underscored the value of student engagement, which relates to edTPA Rubric 7.

This coding approach helped to break data into analyzable units from the comments (Coffey & Atkinson, 1996) and served as a means to conceptualize the data, raise questions, and provide preliminary linkages within and among the participants' other survey data (Strauss, 1987). Analytic categories directly from the data were constructed, which forced attention to "study the meanings, intentions, and action of the research participants" (Charmaz, 2001, p. 337). The data were analyzed using NVivo Version 10 (2016), a data analysis program for qualitative researchers.

## FINDINGS

In this section, the findings are presented in the order of the study's research questions, which are restated below.

1. What are teacher candidates' perceptions of ATLAS's influence on their thinking about planning, instruction, and assessment?
2. In what ways, if at all, does the ATLAS written commentary help teacher candidates attend to and reason through important events within classroom activity?

### **Finding 1: Teacher Candidates Report that ATLAS had an Effect on Planning, Instruction, and Assessment**

Overwhelmingly, the teacher candidate perception survey revealed that the ATLAS activities had a moderate (score of 4) to major effect (score of 5) on all measured areas: planning, instruction, and assessment (Table 2). Notably, there was minimal variance in the responses, with no participants indicating that ATLAS had "no effect" or "minor effect" on their thinking about teacher planning, instruction, and assessment.

Turning to the qualitative analysis of the survey responses provided a useful window into understanding *how* the ATLAS activities were helpful in teacher candidates' thinking. And, because each analytic category of planning, instruction, and assessment was present in the open-ended responses, this findings section provided richer insights into how the ATLAS activities shaped teacher thinking for each area.

**Teacher Planning.** Interestingly, while teacher planning had the highest mean score, this area was the least mentioned analytic category in the open responses. While somewhat limited in mentions, themes emerged in the open-code analysis. Teacher candidates' responses on planning revealed



shifts in thinking or “a-ha’s” by describing the importance of the following (ranked in order of prevalence):

1. Using knowledge of the students to improve learning and growth,
2. Putting in the effort in teacher planning for student success, and
3. Having learning targets inform planning.

The cross-tab analysis further reflected the importance of using knowledge of students in planning. The four subitems in the Planning category had a range of 57% to 86% selection. Of the subitems, teacher candidates indicated the ATLAS activities were most helpful in their thinking on using knowledge of students in planning (73%) and using assessments to monitor student learning (86%). However, the majority still agreed that ATLAS played a role in their understanding of building content understanding (66%) and supporting students' learning needs (57%).

The interactions with the video and written commentary illuminated to the teacher candidates that teachers should consider the diverse learning needs in their classrooms before they start planning. This information allows the teacher to fashion appropriate and differentiated strategies or supports for their learners. The planning considerations, highlighted in the ATLAS commentaries and reflected in the teacher candidates' survey responses, include individual students' learning needs (e.g., students with IEPs or English language learners), students' relevant previous experiences with the content, and the personal, cultural, or community assets their students might bring to the learning environment that could be leveraged in instruction.

Below is one illustrative teacher candidate response on planning, mentioning the importance of using student knowledge and learning targets as part of the lesson planning process.

“I realized that teachers need to do a lot more prior to teaching if they want all students to understand those certain subjects. For example, a teacher needs to know their targets before starting the lesson planning. Then, in the lesson planning, they need to know the modifications or accommodations for certain students. All of this plays a huge role at the end of the lesson.” (survey response)

This response is telling because the teacher candidate, at the start of teacher preparation, is more fully understanding the complexities and tensions that encompass lesson planning, and the “huge role” planning plays in classroom teaching and learning.

**Teacher Instruction.** The qualitative analysis showed that *instruction* was the most referred to category in participants' responses, appearing in

nearly half of the comments. One explanation for the stronger focus on instruction could be because teacher candidates may have limited classroom experiences. Therefore, by viewing the NBCT's video cases, teacher candidates may have made more noticings of instructional activities, leading to more shifts in thinking. Furthermore, instruction is prevalent in the video component of ATLAS, whereas nuances related to planning and assessment are more explicit in the commentaries.

In the cross-tab analysis, Instruction received the most consistently high frequency of selection, with all subitems ranging between 71% and 77% selection by respondents. Between the cross-tab analysis and the qualitative analysis of open-ended responses, the majority of teacher candidates indicated that ATLAS was helpful in shaping their thinking of how to engage students in learning. In their responses, teacher candidates gleaned different insights from the ATLAS cases in how to engage students. These engagement insights ranged from student grouping strategies to subject-specific instructional moves to ways to monitor student engagement in the learning. The following responses are a sampling of the teacher candidates' unique insights.

“Some changes that occurred in my thinking after interacting with the ATLAS cases were how to use small and large groups to teach. Small group learning can be facilitated by a teacher, and students then have a responsibility to work as a group.” (survey response)

“I watched a case in which students were learning about the beginning, middle, and end of the story. The video and commentary was [sic] useful because it was a very diverse classroom and the teacher demonstrated how to engage all students during a class discussion.” (survey response)

**Teacher Assessment.** In step with the quantitative data, a qualitative theme was identified wherein teacher candidates shared how ATLAS assisted their thinking about assessment. More specifically, in the cross-tab analysis, 93% of teacher candidates marked that ATLAS was helpful in using assessment to inform instruction. When asked about specific features of ATLAS that supported their thinking, Assessment showed the greatest variance (48% to 86% across the subitems), with students selecting analysis of student learning (77%) and using assessment to inform instruction (86%) most frequently. Students selected providing feedback (54%) and supporting students' use of feedback (48%) much less frequently.

Analysis of open coding showed the majority of teacher candidates described ATLAS activities as helping broaden their thinking about using varying types of assessments to measure student learning -- beyond just the written quiz or test that teacher candidates most closely associated with assessment. As an illustrative example, in the quote below, the teacher candidate shared how an ATLAS case helped his thinking about how to incorporate alternative assessments (e.g., graphic organizers) to inform the teaching and learning in the classroom.

“Most if not all of the ATLAS cases were helpful to my learning. One ATLAS case about a teacher using a graphic organizer to teach and assess the students was particularly useful. I watched it at the beginning of the quarter, and it allowed me to visualize how the teacher strategically used the graphic organizer to assess and teach a lesson. It was really useful seeing lessons in action through ATLAS and gave me a deeper understanding for how to teach and what will be expected of me.” (survey response)

At a higher level, this quote, alongside so many others, suggests the ATLAS interaction helped unpack teacher candidates general lack of understanding of the vital role assessment plays in the teaching cycle: from planning to instruction to reflection. The same teacher candidate further commented, “I did not know the extent of what goes on in teaching. Assessments were the biggest surprise to me and I was able to see the thoroughness from all of the teachers in their ATLAS cases.” Another teacher candidate echoed,

“After watching these ATLAS cases, I have realized there are many ways to assess children that I did not even know about. After seeing how these teachers write about it has also helped me understand how to analyze the students.” (survey response)

From planning to assessment, the empirical evidence supports the conclusion that teacher candidates have an evolving and deeper understanding of teaching because of their interactions with ATLAS by watching the teacher video *and* reading the commentary. While the video is a clip of instruction, insights into teacher planning or assessment were more likely revealed in the teacher commentary.

## **Finding 2: ATLAS Teacher Written Commentary was Valuable In ‘Pulling Back the Curtain’ on Teachers’ Thinking**

Since most video platforms with classroom teaching videos rarely have accompanying teacher commentary, our second research question asked in what ways, if at all, does the ATLAS written commentary help teacher candidates notice and reason through important events within classroom activity.

Evidence for this question surfaced in the qualitative comments from the survey. The importance of the commentary was the most typical response among the range of comments. Teacher candidates expressed how they experienced a greater shift in their thinking about teaching because the accompanying commentary assisted them in developing a fuller understanding of what goes into accomplished teaching in today’s classrooms. The teacher candidates’ comments suggest that by reading the ATLAS commentary, they had the proverbial “curtain” pulled back, exposing the teacher candidate to the contextual intricacies, planning, and decision-making exhibited by accomplished teachers. Below are two sample comments from teacher candidates that describe how they became aware of some of the more hidden aspects of teaching:

“I just think there is so much more that goes into planning a lesson than I originally thought. On the surface, it may seem very simple, but when you read the accompanying reflection, you see all the reasons the instructor made the decisions that they made and that makes it richer for us from a learning perspective.” (Survey response)

“...There were also some specific details outlined in the commentary that gave insight as to how and why the teacher constructed the lesson to maximize student learning outcomes.” (Survey response)

With the addition of the commentary, the teacher candidates were able to access the teacher’s rationale for their instructional decisions. This can help teacher candidates make meanings that go beyond their initial thinking from watching the video. For example, one teacher candidate wrote, “The (NBCT) teachers provide a specific explanation of each strategy they used for their planning and how benefits to students. These explanations help me to think during my lesson planning for my other courses.” In summary, the

teacher commentary from ATLAS may help make tacit knowledge from accomplished teachers explicit, so novices start to understand more about what they need to know and be able to do to develop their practice.

## DISCUSSION AND IMPLICATIONS

Findings suggest that ATLAS, as a teacher video platform, had a perceived effect on teacher candidates' thinking and that the teacher commentary played an influential role. Analysis of accomplished teacher video cases has implications on what and how teacher candidates apply new understandings of practice to their teaching contexts. Evidence from the survey pointed to the ways that interaction with the ATLAS cases helped teacher candidates demonstrate new insights into teacher reflection, in particular in application to their own contexts. Teacher candidates explicitly communicated how they could apply their new knowledge gained from interacting with ATLAS cases to their context and instructional decision-making. This finding is as expected, considering that a key component of the facilitated inquiry cycle focused on application. The facilitated interaction with ATLAS assisted the teacher candidates in moving from an observational stance to one of actively mediating how this learning could be applied to their practice. Teacher candidates' reflections on their engagement with the ATLAS cases has implications: 1) within their teacher preparation, 2) the edTPA, and 3) classroom pedagogy.

### Implications within Teacher Preparation

Teacher candidates made clear connections between their ATLAS learning and their teacher training. For instance, in some of the education courses, teacher candidates are required to practice lesson planning and, in turn, teach these lessons. This practice is called Micro-Teaching, and one pre-service teacher wrote how ATLAS helped in this area:

“Reading the commentary was helpful because it gave me an idea of what I could write on my Micro-Teaching commentary. It also taught me the process of how teachers plan and implement a lesson.” (survey response)

Reflection is a common practice in preservice teaching programs. However, candidates do not often have examples of high-quality reflections from

accomplished teachers to explore as models of deep reflection before they reflect on their own. With ATLAS, candidates can examine the aspects of classroom practice that accomplished teachers find important to reflect on, and which events may be less important. The ATLAS commentaries help candidates simplify the complexities of teaching and develop more focused ways of framing classroom activity to pay closer attention to significant events during a lesson. Teacher educators could help develop candidates' noticing and reflection skills by having them actively respond to their observations in the ATLAS case materials and compare their noticings to each other and to the NBCT featured in the case to identify what they found similar, and where they varied. They could then reflect on a lesson they recently observed or taught in their context and model their reflection around what they learned from the NBCT's commentary. The hope is that if reflection is established as a teaching practice, candidates are more likely to engage in lesson reflection through their induction years to continue to improve their instructional effectiveness.

### **Implications for the edTPA**

With the increasing prevalence of edTPA being consequential for licensure or a key assessment in teacher preparation programs (Pechone & Whittaker, 2016), teacher candidates understandably have concerns about taking and passing the teacher performance assessment. The institution at the center of this study is in a state where passing the edTPA is consequential for receiving teacher certification. In completing the edTPA, teacher candidates often struggle with providing in-depth analysis and reflection on their teaching. Difficulties in providing observation on technical aspects are common during the early phase of teacher candidates' careers. The thinking processes facilitated by ATLAS supports the candidates' noticing activity by providing them with edTPA-relevant concepts that they can apply to the accomplished teachers' videos of performance.

Engaging with ATLAS cases may help address the novice-expert noticing gap by providing concrete examples of accomplished teachers' rich and thoughtful commentaries, anchored to the teacher's knowledge of the instructional context, students, and research-based practices. As an example, the following teacher candidate's survey response demonstrates one way ATLAS may help teacher candidates apply their learning to the edTPA.

"I got to read in-depth [in the ATLAS commentary] about the teacher's reasoning and how she described her class and students.

This case has helped me see how I can give feedback to students and how to explain my reasoning in depth on the edTPA.” (survey response)

ATLAS cases have been tagged using criteria from edTPA rubrics. For candidates who need help interpreting what edTPA prompts are asking for or what types of evidence support different rubrics, they can search through the ATLAS library for examples from different cases. The ATLAS cases, thus, can serve as an additional resource for candidates who are completing their edTPA portfolios.

### **Implications for Classroom Pedagogy**

Individual teacher candidates gleaned different learnings from interacting with the ATLAS cases. Some teacher candidates discussed how to better incorporate student voice. Others described noticings in classroom management. While others explained how they would better monitor student learning, particularly within the context of a whole class discussion:

“I had watched an ATLAS case where it was a middle school math class, and the teacher conducted a class discussion with the class about math. This really had an impact on me because I have never been in a classroom where a discussion setting was used. It was very interesting, and stuck to me in such a way that I really want to use it in my future classroom.” (Survey response)

When viewing video clips of teachers with pedagogical expertise, an instructional activity like a discussion can appear to be very easy to manage. However, the commentaries reveal that these experts spend a significant amount of time establishing and sustaining norms for discourse that are invisible in a twenty-minute clip. It is really important for teacher candidates to be exposed to the planning, to the building of lessons within a sequence, and to the responsiveness of teachers to formative assessment probes that reveal students need new or different things to participate in more highly cognitive demanding tasks. A key takeaway for teacher candidates is that accomplished teaching does not just happen, even though observing a highly effective teacher - through video or live - it may appear that way.

## LIMITATIONS

This study had limitations and because of this, caution should be taken when drawing generalizations from this study's findings. To start, the findings tell the story of what happened at one particular teacher preparation program and may not be generalizable to other contexts. Second, readers should inject a healthy amount of skepticism when evaluating the findings, especially the overly positive responses that ATLAS had a moderate to major effect on teacher candidates' pedagogical thinking. Of the sample frame, 33% of the teacher candidates were non-respondents, and "nonresponse is a problematic, important source of survey error" (Fowler, 2009, p. 66). It is reasonable to assert the non-respondents may carry differing views from the respondents which, in turn, could alter the findings.

Finally, since this is an exploratory study, worthwhile questions are left to pursue. One pressing question is that we do not know, beyond the self-reporting, whether this increased awareness of possibilities actually manifests in other teacher preparation courses, the edTPA, or the execution of teaching. As a next step, a follow-up study is being pursued to determine whether the use of ATLAS cases improves pre-service teachers thinking about teaching, decision making, and eventually teaching practices. Another question rests with the video platform itself. While the teacher candidates had limited exposure to other teacher video platforms, such as the Teaching Channel, there was no formal evaluation (e.g., A/B test) comparing ATLAS to other video platforms.

## NEXT STEPS

Video analysis is an increasingly common pedagogical practice in teacher education. This study's findings point to the potential benefits that teacher candidates find in analyzing video cases with written commentary from accomplished teachers and they also raise questions that should be explored further in how teacher candidates are supported in analyzing video cases through their programs.

Teacher candidates reported that they found the analysis of video cases helpful in thinking about planning, instruction, and assessment. This suggests that video cases should continue to be used throughout teacher education, perhaps even more often. However, if we move forward with that assumption, we need to closely attend to other factors that may also influence how teacher candidates engage with video. One variable that was not ex-



plored deeply in this study was the role of the facilitator. Teacher candidates engaged in video analysis by following assignment instructions or responding to facilitator prompts in class sessions. With the ATLAS cases, the written commentaries could be one place that help novices attend to important classroom events. But, we also believe the facilitator plays a key role in supporting novice teachers in noticing these events. Key facilitator instructional practices and the design of activities that engage novices with expert videos to help them develop skills to notice and respond to important classroom events should be explored in future studies.

Furthermore, we have questions about the timing of when videos from expert classrooms and what selection of topics should be explored to help develop teacher candidate knowledge about practice at different points in their program. If some topics are introduced too early, the difference between novice practice and expert practice may be so far apart that novices will have a difficult time interpreting what is useful from the cases or applying new understandings to their practice. For example, topics around the learning environment and establishing norms could be useful to a teacher candidate just starting to make sense of the chaos inherent in classroom activity. But, attending to student thinking within a discipline may be a focus that comes later. Future studies should explore the topics and the resources that teacher candidates find most productive at different points in their teacher training trajectory.

## CONCLUSION

By interacting with the ATLAS videos and having access to the NBCT decision-making revealed in the commentary, we found that teacher candidates have extended their thinking about planning, instruction, and assessment decisions. This kind of decision-making is usually not made explicit to teacher candidates while they are learning to teach. They often see the consequences of decisions during their observational fieldwork or student teaching, but they do not have access to the teacher's knowledge, beliefs, or goals that influence instructional decision-making.

We argue that written commentary from accomplished teachers provides an important resource that can help teacher candidates think about, write about, and articulate decisions they need to make about their practice. When paired with video, the commentary is an important resource that can have major implications for teacher education. The results of these inquiries will help teacher educators better understand how to effectively engage teacher candidates with video of P-12 teaching.

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## APPENDIX 1: SURVEY ITEMS

Thank you for participating in our quick survey. Your responses help us get a better picture of ATLAS as an instructional resource. To start, please select the courses in which YOU have used ATLAS.

- Seminar
- Classroom Assessment
- Literacy
- Responsible Childhood Assessment

Use the sliders to estimate how many ATLAS cases you interacted with (view videos, read the commentary, etc.) through structured classroom activities (from all your courses) and on your own (not directly related to a classroom assignment).

\_\_\_\_\_ # of ATLAS cases from CLASS ASSIGNMENTS

\_\_\_\_\_ # of ATLAS cases NON-RELATED TO A CLASS ASSIGNMENT

("On your own"):

To what extent were the ATLAS activities, from this quarter, helpful in your thinking about teacher PLANNING (supporting learning needs, using knowledge of students, etc.).

- 1 – No effect
- 2 – Minor effect
- 3 – Neutral
- 4 – Moderate effect
- 5 – Major effect

Answer If To what extent were the ATLAS activities, from this quarter, helpful in your thinking about teach... 4 – Moderate effect Is Selected Or

To what extent were the ATLAS activities, from this quarter, helpful in your thinking about teach... 5 – Major effect Is Selected

Identify any specific areas that ATLAS was helpful in shaping your thinking.

- Building Content Understanding
- Supporting Learning Needs
- Using Knowledge of Students
- Assessments to Monitor Student Learning

To what extent were the ATLAS activities, from this quarter, helpful in your thinking about teacher INSTRUCTION (learning environment, engagement in learning, deepening thinking, etc.).

- 1 – No effect
- 2 – Minor effect
- 3 – Neutral
- 4 – Moderate effect
- 5 – Major effect

Answer If To what extent were the ATLAS activities, from this quarter, helpful in your thinking about teach... 4 – Moderate effect Is Selected Or To what extent were the ATLAS activities, from this quarter, helpful in your thinking about teach... 5 – Major effect Is Selected Identify any specific areas that ATLAS was helpful in shaping your thinking.

- Learning Environment
- Engagement in Learning
- Deepening Thinking
- Analyzing Teaching Effectiveness

To what extent were the ATLAS activities, from this quarter, helpful in your thinking about teacher ASSESSMENT (analysis of student learning, providing feedback, supporting students use of feedback, using assessment to inform instruction, etc.)

- 1 – No effect
- 2 – Minor effect
- 3 – Neutral
- 4 – Moderate effect
- 5 – Major effect

Answer If To what extent were the ATLAS activities, from this quarter, helpful in your thinking about teach... 4 – Moderate effect Is Selected Or To what extent were the ATLAS activities, from this quarter, helpful in your thinking about teach... 5 – Major effect Is Selected Identify any specific areas that ATLAS was helpful in shaping your thinking.

- Analysis of Student Learning
- Providing Feedback
- Supporting Students Use of Feedback
- Using Assessment to Inform Instruction

Please describe a particular ATLAS experience (structured classroom activity, discussion, viewing the case, reading the commentary, reflecting, etc.) that was memorable or useful to you and explain WHY.

Since this is your first quarter in the teacher education program, you may come into the program with certain presumptions of what accomplished teaching is. Describe what changes in your thinking about teaching (“ah-ha moments”), if any, that occurred from interacting with ATLAS.

Is there anything you would like to mention about your ATLAS experience that hasn't been asked? (optional response)