

To be submitted to “Teaching and Teacher Education”

RUNNING HEAD: Seeing Instructional Decisions

Seeing Instructional Decisions:

The use of video-based Evidence to Analyze, Act on and Adapt Preservice  
Teacher Practice.

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Abstract

Instructional decision making has been called the basic teaching skill (Shavelson, 1973). Instructional decision making encapsulates the curriculum related decisions teachers make on a daily and momentary basis. High-level decisions, such as lesson planning, require teachers to synthesize and evaluate their thinking and actions through reflection (Wilens, Ishler, Hutchison, & Kindsvatter, 1999). Yet, research has failed to provide evidence connecting reflection to teacher development and student learning. The purpose of this series of studies is to explore preservice teacher development as they use video-based evidence to analyze and subsequently act on their instructional decisions. Initial results indicate marked differences in teaching as well as the ability to discover and address discrepancies between thought and action.

Instructional decision making has been called the basic teaching skill (Shavelson, 1973). Instructional decision making encapsulates the curriculum related decisions teachers make on a daily and momentary basis. High-level decisions, such as lesson planning, require teachers to synthesize and evaluate their thinking and actions through reflection (Wilén, Ishler, Hutchison, & Kindsvatter, 1999).

Studies centered on understanding the relationship between instructional decision making and effective teaching have been reported for nearly four decades. In 1968, Phillip Jackson proposed the idea of preactive and interactive instructional decisions in his book, “Life in Classrooms”, which continues to influence teacher educators even today. Decision-making models, expert/novice teacher thinking comparisons and understandings of teacher judgment emerged from this research, among a multitude of other insights (Clark & Peterson, 1986). Yet, while researchers were furthering our understanding about the intricacies of teaching, their findings were not having a direct impact on teacher’s own instructional decisions.

Teacher educators recognized this disconnect; hence there has been a concerted effort to close the gap between research and practice (Shulman, 1986). Schön’s reflective practitioner work (1983) was a catalyst for reflection to become an applied method of analyzing one’s own instructional decisions and teaching. Despite the wide appeal of reflection in teacher education, research findings do not delineate a relationship between these practices and teachers’ decisions. The AERA panel on Teacher Education recently released a report on the status of research on teacher education in the past twenty years (Cochran-Smith & Zeichner, 2005). The eight-hundred page volume reports on research

on teachers' beliefs and attitudes, preparing teachers to work with diverse and special populations, professional and pedagogical content knowledge, teacher education program structure, program and individual accountability measures, and the politics of teacher education in changing times. Conspicuously missing is any mention of research on reflective practices in teacher education, a major component of many teacher education programs. This is particularly notable given that author and co-editor, Kenneth Zeichner, has long been at the forefront of reflective practices in teacher education (Zeichner, 1990, 1994; Zeichner & Liston, 1996; Zeichner & Tabachnick, 1991). Fred Korthagen and Theo Wubbels (2001), proponents of reflective practices themselves, give a possible indication for the lack of such a chapter when they note:

One of the almost shocking discoveries one can do when starting to screen the international literature on the issue of promoting reflection is that there is very little research on the effectiveness of teacher education programs aiming at the promotion of reflection....Many studies rely heavily on comments made by student teachers during course evaluations, as well as on self-reports, general observations, and isolated anecdotes. (p. 89)

Clearly, research on reflective practices in teacher education has also failed to generate a solid base for understanding how preservice teachers might systematically examine and assess their own instructional decisions. Subsequently, there is a dearth of evidence delineating how and why teachers examine, assess and make decisions to improve or change their practices. There is therefore a need to further explore methods of monitoring one's own instructional decisions based on something more than self-reports, general observations, and isolated anecdotes.

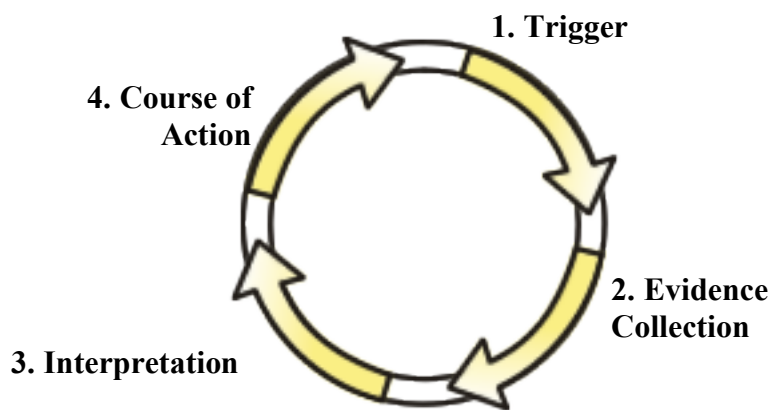
Although there has been much written and studied about instructional decision-making, there has not emerged a systematically applied method whereby developing teachers have been able to measure and monitor their own instructional decisions through more than anecdotes and self-reports. Recently, Recesso et al (Recesso et al., in press) have proposed Evidence-based Decision Support (EBDS) as a systematic method to collect, analyze, interpret and act on evidence-based explanations centered on successful or deficient classroom practice. EBDS supports the use of video, interpreted through specific lenses or rubrics, as a way to systematically analyze and adapt a teacher's practice. The purpose of this study was to understand how a group of preservice teachers at a large public university in the SouthEastern United States used an online Video Analysis Tool to critically analyze their own instructional decisions, and record the resultant actions.

### Background to the Study

Evidence-based Decision Support consists of four stages (see figure 1). In the first stage, a teacher chooses an issue to focus on (*Trigger*). This might range from micro level concerns in the classroom, such as how to instruct a struggling student, to macro-level issues, such as measuring teacher effectiveness to inform decisions about rewards and compensation. Once a teacher chooses a focus, s/he identifies and collects evidence (*Evidence collection*) directly or indirectly linked to the practice (e.g. lesson plans, video recordings, etc.). The teacher then uses a lens, such as state teaching standards, to analyze and interpret the collected evidence (*Interpretation*). A “lens” is a metaphor for an assessment tool that amplifies fine-grained attributes of practice that are of concern

while suppressing those not of interest, thereby providing guidance and perspective during analysis. The teacher synthesizes this analysis and purposefully enacts a solution through a course of action (*Course of Action*). Using EBDS, developing teachers may be able to rigorously and systematically measure, monitor and modify their own instructional decisions.

Figure 1. The Evidence-based Decision Support Cycle



Researchers have created the Video Analysis Tool (VAT) to facilitate the collection and analysis of video-based evidence for the EBDS process (see Figure 2) (Bryan & Recesso, 2006; Recesso et al., in press). Through the VAT (see URL removed for blind review) teachers upload pre-recorded videos of their practice and analyze them using a simple commenting system. This system removes the concerns raised by introducing technical aspects of video editing programs, such as learning how to cut, edit and export a video. This is facilitated by the non-destructive “commenting” process (*Interpretation*). To create a comment on a video clip a teacher need only watch the video and, when she reaches a point in the video she wishes to interpret, click on a “start” button (step 1). The teacher then types her comments in the “comments” field and, if

desired, interprets this “clip” through a particular aspect of a chosen lens (step 2). She then marks the end of that section of video by clicking on the “end” button and submitting the clip to a database (step 3). For example, in Figure 3, the student teacher has created a clip (#10662) and commented on it, rating it as an example of “advanced” practice of classroom management according to the GTSM lens (clicking on the hyperlink “1\_1\_1\_A” reveals the details of this lens). Because the VAT is non-destructive, teachers need not worry about losing portions of their videos due to editing mistakes. By allowing teachers to clip and analyze specific sections of their videos using lenses, they are able to cull out the most salient aspects of their practice while remaining situated within the entire experience. Thus, the VAT allows teachers to focus on the actual instructional decisions they make during teaching. By combining this tool with the EBDS process, teachers are able to use their analyses to inform future decisions and iteratively collect evidence on the effectiveness and implementation of these decisions.

Figure 2. The VAT commenting tool.

Video Tools [Create Video Clips](#) [Refine Clips](#) [telrod\\_9](#)

Home Video Tools My VAT

**Step 1** ID  (Auto)

Start Time  (Required) [Help ?](#)

End Time  (Optional) << 10 Sec 10 Sec >>

**Step 3**

Comments **Step 2**

Send Clip to Bin Delete Clip Clear Screen

Ready

Clip-ID	Start	End	Comments

**Lens**

**Define your Video Clip using the Georgia Teacher Success Model (GTSM) Lens**

**Learning Environments**  
Teachers create learning environments that encourage positive social interaction, active engagement in learning, and self-motivation.

**Classroom Management & Learning Community**

**RATING**

Not Yet Evident

Basic 

- Establishes classroom management and leaning community plan.
- Plans, organizes and arranges classroom environment.
- Implements class rules established in management plan;
- Needs support to implement classroom management plan
- Is aware of strategies for developing effective classroom management and learning communities

Proficient 

- Management and learning community plans address class needs.
- Incorporates feedback in changes to plans.
- Recognizes strengths and shortcomings of plans.
- Attempts alternative approaches to classroom management and learning communities.
- Collaborates with others to address class and/or individual situations.
- Seeks opportunities for professional growth to improve classroom management and learning communities.

Advanced 

- Adapts management and learning community plans to address strengths and needs of diverse learners.
- Implements a range of activities to engage the whole class and each child in the learning community.
- Develops innovative approaches to classroom management and learning communities.
- Is a resource for peers in classroom management and learning community planning and practice.

Figure 3. A VAT video with “Clips”

Video Tools [Create Video Clips](#) [View Others' Clips](#)

Home Video Tools My VAT

**GTSM**

Clip ID	Start	End	Comments	Section
10662	00:54	01:58	First of all, this is a horrible arrangement! I can barely see kids. I hope that it will be easier to see them later when we do the stand up stuff...I think that most of the students are actively engaged because you can hear all of the singing and you do not see any of them just sitting there. Many of them are using the alphabet on the wall to look at while we go through the alphabet. I love that! They are using their resources. I think that this is a great show of a good learning community.	1.1.1-A
10663	02:01	04:12	The kids love this song. All of them are singing the song, but many of them are still moving around and wiggling. I think that I am ok with this because they are singing. It is hard for them to hear all of the vowel sounds because we have not learned them all. I am trying hard to annunciate the sounds so that they can hear them.	3.1.1-P

**Lens**

**Clip #**

Ready

## The Study

As is typical of many teacher education programs, the program in question engages candidates in successively increasing field experiences each semester. For this study, a cohort of 27 preservice teachers participated in a self-inquiry project in which the entire class volunteered to use the VAT during a one-month field experience. During this time, they each taught an entire unit (five lessons) in their cooperating teacher's class. The requirements of the project were that each cohort member: (1) identify an area of their practice to focus on; (2) record themselves performing that practice; (3) interpret their practice through a chosen "lens"; (4) choose, enact, and record a course of action; and (5) interpret the second video recording using the same "lens" that guided their course of action. The "lens" each member used to interpret their decisions was individually constructed by researching a minimum of five different scholarly writings on their chosen topic. Each member presented a summary of their findings and experience to the entire class roughly one month following their field experience.

### *Participant Selection*

To generate a deeper understanding, we examined 4 of the 27 participants more closely. We wanted to inspect the instructional decisions of candidates that were more likely to use lenses to interpret their actions as well as those that were less-likely to effectively use lenses. Gravenmeijer and Cobb (2006) recommend generating an "authentic task" to identify potential participants. Because we had no prior data indicating which participants would fit into which category, we used Intensity Sampling (Patton, 2002) based on the results of a sample analysis activity. Immediately prior to the

activity, the entire cohort was trained on how to use the VAT. Then, each person watched the first 10 minutes of a video in which a third-grade teacher taught a hands-on geometry lesson. Members were instructed to independently analyze the video based on the teacher's focus being her "ability to establish rapport and an atmosphere of respect" among her students. Participants were given 20 minutes to create these clips in the VAT. Once this task was completed, participants were given a lens that guided what "establishing and atmosphere of rapport and respect" should look like and asked to reinterpret the same 10 minutes of video. The researcher then analyzed each comment (before using the lens and after using the lens) to determine if it: (1) was related to the provided trigger; (2) was unrelated to the provided trigger; or (3) was ambiguous. These results were scored as 1, -1 and .5 respectively and the percent difference in alignment from before using the lens to after using the lens was calculated and graphed (see Figure 4). In addition to this activity, a follow-up survey was administered to the entire class to gauge their own intentions for the self-inquiry project. A total of 7 potential participants were identified, 3 whose comments were highly related before the activity, 2 whose comments initially showed little relation before then lens and complete relation after the lens, and 2 that fell somewhere in the middle. Six of the original 7 participants accepted to participate in the study. Two additional participants withdrew from the study prior to its completion. Thus, while we continued to collect survey data on the entire class, we analyzed the VAT comments and interviewed 4 participants at the case-level (see Table 1).

Figure 4. Percent change on Trigger Alignment from no lens use to after lens use.

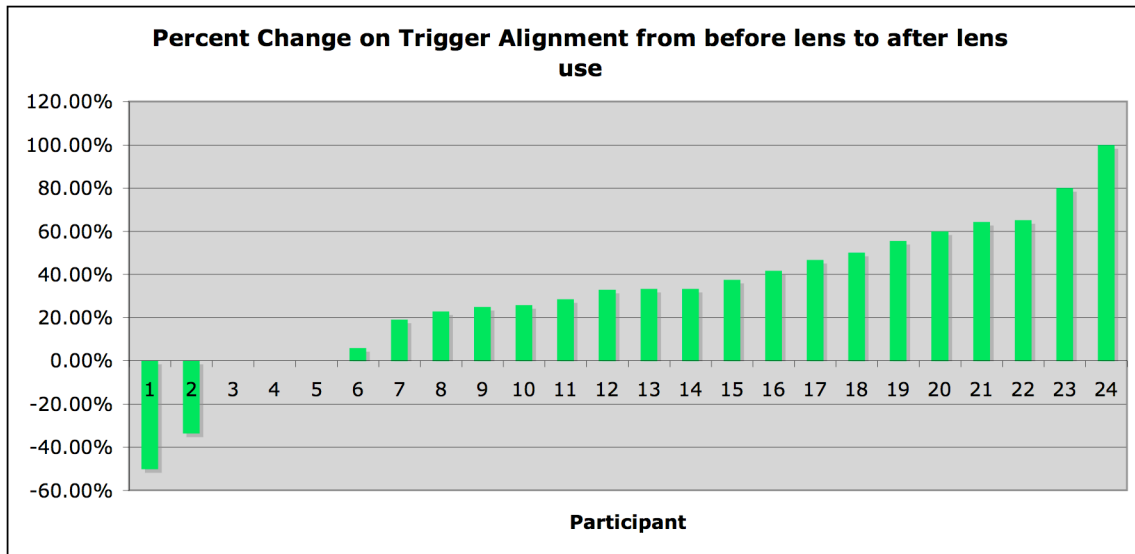


Table 1 Participants' scores on initial coding activity

Participant*	Before using a lens			After using a lens		
	Aligned comments	Non-aligned comments	Ambiguous comments	Aligned Comments	Non-aligned Comments	Ambiguous Comments
Karen	5	0	0	6	0	0
Susan	5	2	0	13	0	0
Natalie	0	6	0	6	0	0
Elise	2	4	0	0	0	1

*Analysis*

The primary sources of data for this study consist of VAT-created annotations, or “comments” and follow-up interviews completed after the conclusion of the study. Secondary data sources consisted of recorded final presentations of each case given by participants on the last day of class (which was not graded), an initial and follow-up survey, lesson plans, and documents provided by each participant as witness to their

\* All names are pseudonyms

actions. These secondary sources were used to triangulate findings from the primary data (Patton, 2002).

This study was the first, but not final, planned field experience in which the cohort would be using EBDS methods and tools to assess, analyze and adapt their instructional decisions. To develop a working theory to test this and future studies, we used grounded theory coding techniques (Glaser & Strauss, 1967) to discover emergent themes and issues. Transcribed interviews, VAT comments, class presentations, and participant documents were individually coded within each participant. Thereafter, we used a constant comparative process to look for and define themes in and across participants. Matrix displays (Miles & Huberman, 1994) were then created for each source of data, marking triangulation points among each set. Despite coding scheme creation, original transcripts were always displayed in the same matrix row to ensure fidelity to the original meaning of each data point.

#### Case Study Findings

If only one theme could emerge from this study, it would be that of “change,” defined as modifications to one's instructional decisions, as well as the effects those modifications may have had on others. This is not surprising, given the nature of the assignment, the researcher’s focus on instructional decisions, and the relative inexperience in teaching of each of the participants (none had prior experience teaching outside of their cohort). Additionally, because each participant was allowed to examine *any* aspect of her teaching, and because each participant developed her own lens, a single, generalizable change could not have occurred. Rather than diminish the importance of the changes each participant made, this points to the dynamic strength of using video for

evidence-based decision-making. It is important to note that all participants attributed a great deal of their change in their second video to the interpretation of their first video. To better understand each participant’s changes (Table 2), we first present their experience on a case by case basis. We then discuss the major themes from across each case that lead to these changes and the implications of these themes to teacher education.

Table 2. Summary of each case study participant’s inquiry focus and noted changes.

Participant	Inquiry Focus	Realizations	Changes/Resolutions
Natalie	Student Engagement	<ul style="list-style-type: none"> <li>• Students not involved. Was only addressing one at a time.</li> <li>• Materials not used to advantage</li> </ul>	<ul style="list-style-type: none"> <li>• Design activities that all students can participate in.</li> <li>• New and Improved Materials</li> <li>• Attitude Change</li> </ul>
Elise	Teacher Self-Efficacy	<ul style="list-style-type: none"> <li>• Consistency</li> <li>• Clarity of Directions</li> <li>• “Back and Forth”</li> <li>• Tonality</li> </ul>	<ul style="list-style-type: none"> <li>• Established expectations early</li> <li>• Gave “step-by-step” instructions</li> <li>• Said what she meant and meant what she said.</li> <li>• Used commanding not pleading tone.</li> </ul>
Karen	Questioning Strategies	<ul style="list-style-type: none"> <li>• Number of questions asked</li> <li>• Level of Questions Asked</li> </ul>	<ul style="list-style-type: none"> <li>• Recorded levels of questioning using Bloom’s taxonomy</li> <li>• Started with higher level questions</li> </ul>
Susan	Verbal/Nonverbal Communication	<ul style="list-style-type: none"> <li>• Vocal intonation</li> <li>• Enthusiasm</li> <li>• Dissonance</li> </ul>	<ul style="list-style-type: none"> <li>• Speech Speed</li> <li>• Enthusiasm</li> <li>• Effective use of touch and verbal instructions</li> </ul>

*Natalie Braxley*

Natalie’s inquiry focused on student engagement. As a result, her VAT comments dealt just as heavily with student actions as with her own. She reported in her interview that the two lessons were polar opposites; one was a complete failure and the other was a complete success. This was due, at least in part, to the added stress of the regular classroom teacher unexpectedly leaving to take her own daughter to the hospital in the middle of the first recording. Natalie felt she was never able to get the students

back on task. She commented in the VAT that one student claimed they did not have to listen to her because she was not the regular classroom teacher. Furthermore, Natalie credits part of the problem to the fact that she planned a circular floor activity for a square setup. The students were unaccustomed to this setup and were therefore quite unruly.

Natalie's analysis of events took her beyond surface-level justifications. She acknowledges these issues in her final paper, but then comments that the greater problem dealt not with classroom arrangement, but rather with the fact that, while conducting a group activity, she was only allowing one student to answer, or participate, at a time. "Since only one student out of twenty-three participated at a time, the twenty-two students not involved were obviously distracted." She resolved that, during the next lesson, she would attempt to involve everybody in all aspects of the lesson. She employed several techniques in order to get the students more involved.

The first technique was to modify materials. Since her unit was on weather, she had used a large thermometer for the first lesson. Noting in her video that not all the students could see, and that introducing it at the conclusion of the lesson led to disinterest, she was motivated to use materials she had previously thought about using but decided against, such as graph paper with individual thermometers. She commented in analyzing her second video that "There was talking about the weather. They were very quiet while they colored their graphs." Since she defines student engagement, in her lens, as "involved, paying attention, and on task" this was a significant result of the change she had made.

The second change Natalie made was to her questioning strategies. Natalie reports that in her first lesson the students “were all sitting on the floor and I was asking questions, and only one of them can answer at a time.” In her second video, Natalie changed the nature of the answers required in her questions. In her second VAT comments, she notes, “I do not just give them the answer, I make them come up with the answers.” As a result, she felt that the students were more engaged because they had to come up with their own answers. She comments, “I like my questioning a lot better today, because they demand actual answers and hypotheses from students”.

Natalie’s changes to her questioning strategies move beyond allowing more people to respond and requiring deeper thinking of her students; an aspect of personal change occurred when she analyzed her first video. She notes, “I only call out the behavior of the students that are labeled “bad” and who usually don’t listen. Watching the video I clearly see that other students are not paying attention also.” She realizes that stereotypes have played a role in the way she calls on students. While this comment was in the context of discipline, it affected the way she attended to students through greater aspects of her instruction and encouraged her to call on all students. Perhaps the greatest change of all was in her own reported attitude change that she became more tolerant of student behavior, focusing instead on their learning.

*Elise Priestly*

Elise’s lesson was on Japan and focused on multiculturalism and haiku poetry. Her inquiry focus was on self-efficacy, which she defines as “confidence and clarity in directions and expectations.” In her final presentation, she summarized the things she noticed she needed to change as consistency with expectations, clarity in direction-giving

and overall stress from being observed. In addition her VAT comments and interview reveal a focus on vocal intonation.

An overarching theme for Elise was the issue of consistency, ranging from the clarity of her directions, to treating students fairly and equally to enforcement of class rules. In her first video, Elise notices that the students are not following her directions. This is not due to behavioral issues, but as she states, “I was not that clear to when I wanted them to shut their eyes and begin thinking.” Thus, the students were confused about how to do what she wanted them to do. Throughout her first VAT analysis, Elise notes several inconsistencies in student behavior due to her own unsurity in direction-giving. After watching her video that evening, she resolved: (a) to give clear guidelines and directions at the beginning of the lesson; (b) to be more clear in what she expected of the students; and (c) to get their attention prior to giving out any directions.

It became clear through her second video analysis that Elise made a successful effort to address each of these issues. Within the first three minutes of her video, Elise has given clear directions and expectations for what the entire lesson will consist of. “I asked them to raise their hand to tell me what they think they are going to do today. I gave step-by-step directions to what they would be doing.” Elise’s step-by-step instructions were not limited to a lesson overview. Throughout the entire class, Elise constantly instructs students of what they are to do as they begin each activity or receive a new material. She does this to ensure that they understand the purpose of each item and what they are to do with it.

Perhaps more important to her inquiry focus, in order to gain students’ attention, Elise seems instead to have given them her attention. She notes, “I give them all of my

attention, and give them my eye contact to show I am listening. I help clap words out with the students.” Throughout the lesson, she observes how often she gets down to the students level and looking them in the eye. At one point, she describes how she helps a struggling child differently and that a clear and confident teacher is one who understands and addresses individual students’ needs. It is clear that students pay more attention to her as she pays more attention to them.

*Kristen Cooley*

Kristen used Bloom’s taxonomy to examine her questioning strategies in the classroom. She first recorded herself in a small group lesson and later in a class science lesson. Unfortunately, she did not realize that the video camera ran out of storage early in the second recording. By the time she realized what had happened and created more space, the class was nearly over. As a result, the scope of the data we present on the success of her changes is limited to interview and secondary source data (class presentation, final paper, etc.). Fortunately, due to Kristen’s diligence and the actual decisions she came up with from the first analysis, she was able to use an alternative source of data to analyze her second video—her unit lesson plan. Just how she did that is detailed in the case that follows.

Using Bloom’s taxonomy as a lens, Kristen planned her first lesson fully intending to ask higher level as well as lower-level questions. She states in an email sent prior to beginning the her field experience, “I want a balance between lower level questioning (recalling information) and higher level questioning (relating information.)”. In fact, she has the practice of writing out all of her questions prior to the lesson. But by rating each of the question she asked in her first lesson using Bloom’s taxonomy, she

found the problem to be that all of the questions she interactively “added on” in the heat of the moment were Knowledge-level questions. Out of 34 total questions, 24 were knowledge-level, 7 were comprehension and 3 were application-level questions. She had no analysis, synthesis, or evaluation questions.

Kristen resolved that in her second lesson she would write down all of her questions. She also rated these according to Bloom’s taxonomy and, according to her analysis of her planned lesson, out of 31 total questions, 12 were knowledge level, 8 were comprehension, 4 were application, 1 was analysis, 5 were synthesis and 1 was evaluation. This spread was necessary because, according to the research she had read, it was important to represent all question levels. “I wanted to get those knowledge ones in there, but I didn't want too many of them.” Since she noted in the first video that she could “go down” from the level of question she originally intended but that “going up” was more of a challenge.

Kristen also noted that she wanted to stick to the questions she had planned. She realized in her first video that it was easy (and tempting) to come up with new questions in the heat of the moment, but that these tended to be lower-level questions. In order to keep herself from straying too far from her plan, she wrote down all of her questions on notecards. During her lesson, she found herself, “analyzing, thinking in my head on-the-fly, questions...I wasn't just asking them, just to ask them. I was really thinking about them beforehand, because I had all these ones listed out.” Watching her video helped her to “think purposefully through [her] questions before [she] asked them.”

*Susan Campbell*

Susan taught a unit on living and nonliving things to a class of kindergarteners. Before entering the classroom, she sent the researcher an two-page document detailing her inquiry focus, which is summed up by the statement, “I want to be conscious of how my nonverbal communication supports or contradicts my spoken words.” Included with this document was an observation sheet that Susan had created from her search of the literature on verbal and nonverbal communication. Susan indicated that this form guided her inquiry and that the comments she made in the VAT were only because she “had to make comments in the VAT” for class. “I did it twice, really... I just made the comments that I had to make on there for my class. You know, so they could see that I looked at it that way. And then...I would watch it again, and use this form.” Thus, the bulk of the analysis for understanding the changes Susan implemented relies on her interview and self-rating form instead of her VAT analyses. These are triangulated with other sources when available.

Susan’s first analysis revealed rather positively that her vocal intonations were, for the most part, on-par with what she wanted to communicate. She points to examples of when she “varies volume and pitch for emphasis”. In addition, the entire plus/minus section on Vocal Intonation indicated she saw eight positive instances of varied pitch, volume, or use of the appropriate expression, and only one negative instance of varying volume. What is interesting to note is that, during the analysis, Susan added an entirely new category to the list—“Fast talking!!!” She marked three minuses and no pluses in this category. “That’s the introduction to my unit and I really noticed that I talked really fast,” she reported. She set the goal that in future lessons she would use “speed for emphasis.”

When Susan analyzed her second video, she again added the “Talking too fast” category. She still marked two minuses, but also added a plus this time, showing a conscious effort to vary her speed, but again noting there “there is still room for improvement.” While this may seem to be a general statement, a closer look at Susan’s second analysis reveals that she gained a greater understanding of exactly how and where this improvement was needed. In answer to the question, “what are some aspects of nonverbal communication that I can work on for next time?” Susan writes, “My voice—I still have problems with my intonation and volume when I am giving directions. *It happens more when I am reminding students to stay on task*” (emphasis added). Thus, even though Susan still noted that she needed to improve her verbal communication, through successive analyses she was able to pinpoint in which situations she needed most improvement.

Perhaps the area where Susan felt the most need to improve was in the dissonance between her verbal and nonverbal communication. This manifests itself in a variety of contexts: disciplining the students in a “weak” voice; constantly saying “right?” when she is not asking a question; paying attention to students after telling them not to speak out (to which she comments “but why shouldn’t he? I paid attention to him”); and even saying “ok” before everything.

Susan specifically mentions that she needs to work on “turning towards students who spoke out of turn and acknowledging them” in her analysis. In contrast to her own rating of “most of the time” to the question Likert item, “My facial expressional supported what I was saying” in the first analysis, she gave herself a, “all of the time” rating in the second analysis. On the item, “My use of body language (gestures, posture,

facing or turned from students) supported by verbal communication”, she moved from a “sometimes” to “all the time.” She carried this feeling through to her follow-up interview when she stated, “and I definitely improved [my body language].”

### Discussion of Cross-case Findings

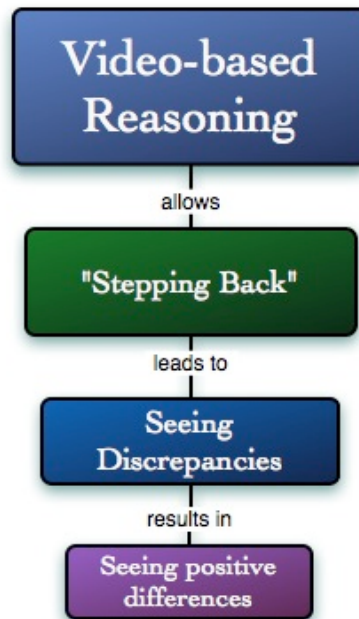
Despite years of research, no single instructional decision making model ever emerged as a way to guide teachers’ thinking, nor could one model have reasonably emerged. As demonstrated in the above study, instructional decisions vary by person and by context. Additionally, because each participant chose her own focus, multiple teaching principles were explored. Thus, the meaning gained for each participant was truly individual and served to inform her own, situated instructional decisions (Table 2). While the aforementioned changes varied by case, however, the manner in which they came about shared common themes among all participants. In the next section, we present the major findings that emerged across participants that may be useful to others who wish to employ video and other evidence-based techniques to improve prospective teachers’ instructional decision-making abilities.

#### *Seeing*

Themes that emerged across participants are consistent with research that illustrates the notion of “noticing” through the use of video and video cases in teacher education (Sherin & van Es, 2005). In particular, the idea of “seeing” as discussed by the participants poses significant value to teacher education. Participants in the current study were also especially vocal about “seeing” what was “really going on” in their classrooms. Specifically, participants talked about seeing positive differences from one

video to the next, and discrepancies between their perceived recollection of events and what they “really saw” on camera. Figure 5 illustrates the process participants described as seeing that resulted in their reported changes. In the following discussion, we note the importance of “stepping back” to notice these discrepancies and differences. We then discuss the important role of “lenses” in affecting the way participants’ “seeing” occurred.

Figure 5. The “seeing” process.



### *“Stepping back”*

Susan mentions the utility of using video to see without the busy interference of class time. She saw the use of video as a chance to “step back from being in the moment and just look at yourself, and not worry about ... what's actually going on in the classroom right then.” In a study by Whitehead and Fitzgerald (2007), preservice and inservice teachers also benefited from weekly mentoring meetings in which they watched videos of each others’ practice. One teacher mentioned, “you haven’t got the adrenaline

rush that you've got in the classroom so there is time for critical reflection you notice and analyse more like you were watching a documentary and you pick away at it" (p. 8).

Karen noted that she could only fully investigate her inquiry by seeing and hearing it. She explained, "it...made me a stronger questioner. Made me stronger in creating discussion and creating upper level questions." Prior studies on interactive decision-making (Johnston, 1994) reveal that novice teachers in particular experience cognitive overload when they attempt to reflect-in-action. Participants in this study mitigated cognitive overload by capturing direct evidence (Schum, 1994) of their practices. Gitlin and Teitelbaum (1983) note that the ability to "step back" is an important process in teacher inquiry projects. Teacher educators often refer to this as the reflective process (Schön, 1983). Dewey (1910) explains that, "reflective thought means judgment suspended during further inquiry" (p. 13). In this case, video allowed participants to enquire further into their own practices while literally suspending judgment.

Video alone, albeit important, may only be a single piece of what leads to the desired criticality and insight gained in these "stepping back" experiences. Elise commented in regards to sharing her video with others, "your mentor teachers don't know you as well as you know yourself, so I can see if what they see is what I see what I'm doing." In other words, Elise recognizes that her schema of what occurred during teaching, coupled with the video, gives her advantage over others with whom she shared her video, but that being able to view the video allows her to understand what others may have "seen" that she missed. Using video recordings of an experienced teacher, Ethel and McMeminan (Ethel & M., 2001) also discovered that preservice teachers were better able to connect theory and practice when they were allowed to also view a teacher

“thinking aloud” to explain his instructional decisions. Thus, the effect of video is magnified with a cognitive understanding of that experience. Natalie comments that she needs to first write things down to begin to understand them. These experiences suggest not only that video allows preservice teachers to “step back” and see their practices, but also that Schön’s (1983) popular notion of reflecting-on-action may be more important to beginning teachers than the expert-teacher quality of reflecting-in-action.

### *Discrepancies*

Equally important to the notion of being able to step back and view video to critically think about one’s decisions, is the ability for that evidence to reveal contradictions between one’s thoughts and actions. Participants noted discrepancies between what they perceived to have happened in the class and what they saw on tape. These discrepancies helped to disconfirm previously held notions. Elise noted, “I thought everyone for the most part was listening, until I watched, I saw these kids over here were totally not paying attention to me.” Meanwhile, Karen commented, “It’s something I’ve known, I just haven’t been aware of it...I didn’t realize it until I was writing down every question I asked.” Nicole realized that the students she was reprimanding for poor behavior were the typical “bad” students, but that other, non-labeled students exhibited the same behavior that went unacknowledged. In each case, the preservice teacher believed one thing had occurred during class, but “saw” something else on video. This is similar to a case presented by Artzt & Armour-Thomas (2002) in which preservice teachers use video and class observations to look at their own and others’ practice. One student teacher, by observing a colleague, suddenly sees in her the mistakes he himself was making. In many teacher education programs, student teachers are instructed to write

daily reflections on what occurred in class. While such introspection is arguably important in the process of becoming and remaining a good teacher, these discrepancies between remembered and recorded events cannot be highlighted without the use of evidence more representative of actual events. Recently, Bryan & Recesso (2006) have used the same Video Analysis Tool to help preservice science teachers uncover contradictions between their personal teaching philosophies and their enacted practices.

### *Differences*

All participants mentioned that they felt they had improved and were best able to “see” these differences through the use of video. Elise reported, “I saw a difference in my teaching and in the way [the students] responded to my teaching.” In her video comments she highlights several instances in which she uses specific cues to keep students engaged and her students’ reactions to these cues. She contrasts these actions with her hurried and absent instructions present in the first video. Karen, noticing her own frequent use of lower-order questions in her first video, actually wrote out all of her questions for her second lesson during planning, recognizing that she tended to “go down” from the question she began with. Writing the questions down ahead of time assured that she would not exclude higher-order questions from the next lesson. She wrote these questions down on notecards and on the class whiteboard prior to class, noting that these questions became more important to the successful implementation of her next lesson than the lesson plan itself. Nicole claimed, “it...made me realize how to engage students more.” Elise sums the group’s feelings up by noting, “It definitely has helped a lot. In seeing what I still need to work on. ‘Cause...I had an idea of what I had to change, my teaching, but there was more things I saw on there.” It is common for

preservice teachers to postactively reflect on their experiences and recommend changes or suggest causes for their more successful decisions. Remarkably missing from the literature on reflective practices in teacher education is what effect those decisions have on subsequent teaching. In the present study, however, all participants used video to not only initiate, but also verify changes in their instructional decisions.

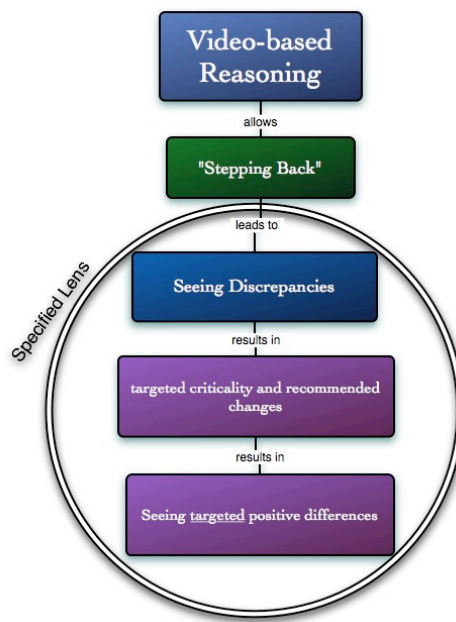
### Lenses

One difference that two participants “saw” that the other two did not touches directly on the important notion of lenses. A key function of EBDS is the interpretation of evidence through lenses. Lenses provide a specific perspective through which complex teaching and learning events are broken down in ways critical elements can be highlighted and extracted. Richert (1991) found that the “depending on the conditions we create for student teachers to think about their work, they think about different things and they think about them in different ways” (p. 135). For some participants, the tendency to be self-critical actually decreased from one video to the next. “I was more critical of myself in the first tape than in the second,” says Elise. Natalie also commented that she was less critical of herself in analyzing her second video. Interestingly, one might also note that both of these participants reported they did not use the lens they had created until analyzing their second video. Also interesting to note is that the two participants who were less prone to use the lens were the two whose comments were less aligned in the pre-lens participant selection activity (see Table 1). In the studies conducted by Sherin and van Es (2005), it took several sessions of video analysis before participants began to focus on student learning and distinct learning events. To avoid uncritical self-evaluations among preservice teachers using video, researchers have found that a

scaffolded structure is necessary (Chula, 2001; Jensen, 1994; Sharpe et al., 2003). Sharpe et al (2003) suggest, “preservice teachers need guidance to integrate and apply the learned pedagogical information in ways that enhance their teaching” (p. 538).

In contrast to Elise and Natalie’s experience, the initial use of a specific lens allowed Susan and Karen to focus on the particulars of their inquiry immediately (see Figure 6). Karen was able to document and rate the exact questions she asked and see the lack of higher order questions. It is also important to highlight that by using a lens for multiple analyses, Susan was able to specifically identify exactly when and in what ways she was having a problem with her use of touch and how she successfully addressed the issue. Consistent with other studies, lenses helped participants to make the desired connection between research and practice (Poetter et al., 1997), something other preservice teachers have reported difficult to do in their own field experiences (Maloch et al., 2003).

Figure 6. The effect of using a lens while “stepping back” through video.



## Conclusion

Most often, videos in preservice teacher education are presented as ideal cases (Hewitt, Pedretti, Bencze, Vaillancourt, & Yoon, 2003), strictly limiting preservice teachers' opportunity to learn from, see, and perhaps most importantly, change their everyday practice. On the final survey 20 out of 22 respondents answered the question, "what was the best thing about this self-inquiry project?" stating it was the opportunity to see, notice or watch themselves teach. Nine of the preservice teachers specifically refer to the changes they made in their teaching. The targeted use of video led preservice teachers to view their teaching in ways that enabled them to both see their teaching from a new perspective and to act on what they saw. By noticing key differences from one video analysis to the next, participants in this study were able to not only see themselves teaching, but also see the effect of the decisions made from their initial analyses. This is something reflection alone has not done.

Studies in which preservice teachers research their own instructional decisions and subsequently adapt classroom practice are few and far between (Parker, 1984). Since Schön's (1983) seminal work, "The Reflective Practitioner," teacher educators have encouraged "effective reflective practice" (Loughran, 2002), developing a myriad of models to help preservice teachers reach this end. At the same time, there have been calls for greater use of evidence for assessing teacher preparation (Education, 2005; Henke, Chen, Goldman, & MPR Associates, 1999; Slavin, 1996; Whitehurst, 2002). As Mislevey et al have found this is best measured through the use of multiple measures (Mislevey & Risconscente, 2005; Mislevey, Steinberg, & Almond, 2003). The current study demonstrates the utility of video evidence to reveal discrepancies in perception and

generate explanations that lead further action, resulting in noticeable change in teaching. There is no doubt that video, in these cases, facilitated the stepping back and “seeing process.”

This research only begins to scratch the surface of the utility of evidence—in this case video evidence. With the current emphasis on teacher quality and the use of evidence, there is a need to document how different forms of evidence affect teacher quality and in what ways. While a critical look at one’s own teaching through video has helped preservice teachers see and subsequently act on their own teaching, there are undoubtedly affordances of other types of evidence that may provide further insight. Future studies need to further explore the use of a wider array of evidence that can be interpreted in ways that improve decision making to make improvements in teaching and learning. In this case the use of video paired with an evidence-based decision support process has fostered critical reflection, revealed discrepancies between thought and action and, perhaps more importantly, resulted in purposeful, informed action.

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