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**To cite this article:** Laura McLaughlin Taddei & Stephanie Smith Budhai (2016) Using Voice-Recorded Reflections to Increase Cognitive Presence in Hybrid Courses, *Journal of Digital Learning in Teacher Education*, 32:1, 38-46, DOI: [10.1080/21532974.2015.1111781](https://doi.org/10.1080/21532974.2015.1111781)

**To link to this article:** <http://dx.doi.org/10.1080/21532974.2015.1111781>



Published online: 18 Dec 2016.



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# Using Voice-Recorded Reflections to Increase Cognitive Presence in Hybrid Courses

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## Abstract

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*This study examined the impact of voice-recorded reflections on cognitive presence in a hybrid course, guided by the research question: How does the use of voice-recorded reflections impact critical thinking and deeper learning for students participating in a service learning experience? Participants of this study included preservice teachers who engaged in a service-learning project where they provided service to young children while developing skills needed to become an excellent teacher. After the service experience, students were asked to participate in a voice-recorded reflection answering specific survey items that were designed to demonstrate critical thinking and deeper learning. Using the community of inquiry framework and specifically examining cognitive presence, student responses to voice-recorded reflections were coded and analyzed. Several implications for pedagogical practices are highlighted, including the use of reflection to develop the growing professional.*

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**T**he purpose of this study was to examine and discuss the use of voice-recorded reflection in hybrid courses, and its impact on cognitive presence. To understand this, the constructs of cognitive presence are explored and integrated into the larger discussion. Garrison, Anderson, and Archer (2000) stated that reflection was “the heart of the thinking process but was framed by a perplexing and confused

situation initially and a unified or resolved situation at the close” (p. 98). Guided by Garrison, Anderson, and Archer’s (2001) Practical Inquiry Model, student feedback is analyzed through this lens, offering pedagogical implications to inform those teaching in blended virtual settings. The National Center for Public Policy and Higher Education (2008) reported one of the biggest challenges for higher education in the 21st century is “to optimize learning by students and by society in general” (p. 3). One way to optimize learning is to engage students in critical thinking and problem solving. According to the P21 Framework for 21st century learning, students need opportunities to analyze, synthesize, evaluate, and reflect critically on their learning experiences (Partnership for 21st Century Skills, 2011).

### Explanation of the Problem

Cognitive presence engages students in both practical inquiry and critical thinking. The Community of Inquiry (COI) framework provides a “means to study the dynamics of online communities of inquiry” (Garrison, Anderson, & Archer, 2010, p. 9). Hybrid courses provide opportunities for leveraging pedagogical techniques effective in both online and traditional settings. However, concerns exist regarding whether online and hybrid courses can bring about this higher level thinking and deeper learning (Akyol & Garrison, 2011). If students understand the course content in meaningful ways, they will have the opportunity to leave the course with deeper learning that can guide them in their future studies and careers. This can lead to an intense learning experience and understanding of course content.

Ensuring students are reaching deeper levels of learning requires intentionality, assessment of learning, and sometimes trial and error.

According to Czerkawski (2014), while not an easy feat, creating these environments that provide opportunities for deeper learning are required. Czerkawski (2014) stated, “At the higher education level, using a well conceptualized instructional design is the best approach in applying deeper learning principles” (p. 37). One way to ensure students take learning to a deeper level is to add a reflection component to it. Deeper learning happens when students are engaged in learning course content and are provided with opportunities to apply this learning and ultimately become prepared to contribute to a global society (Alliance for Excellent Education, 2011). Technology can provide a way for students to reflect in new ways (Verpoorten, Westera, & Specht, 2012).

The International Society for Technology in Education (ISTE) Standards for Teachers encourage educators to create and provide students assessments and learning experiences relevant to the digital age. In this study, VoiceThread, a voice recording tool, was used to provide a 21st-century learning experience for students along with teacher-created questions designed to foster cognitive thinking. Through this learning activity, and deep reflection, the students’ cognitive presence was increased in a hybrid learning environment.

### Categories of Cognitive Dimension

This study is guided by evidence-based research on cognitive presence as espoused by the Community of Inquiry model (Garrison et al., 2000). In this

model, cognitive presence is concerned with “educational transaction” that occurs when students engage with course content, reflection, and reflective dialogue through a scaffolding process (Garrison et al., 2000, p. 94). In this case, faculty members teaching using online modalities have the challenge of developing and maintaining high levels of cognitive discourse relative to course content. According to Garrison et al., (2000), “The extent to which cognitive presence is created and sustained in a community of inquiry is partly dependent upon how communication is restricted or encouraged by the medium” (p. 93).

There are four categories of events within the cognitive dimension that need to happen to stimulate the cognitive processes and critical thinking: (a) triggering event, (b) exploration, (c) integration, and (d) resolution (Garrison et al., 2000). These areas are part of the Practical Inquiry Model. All of these areas together create a transparent trajectory for developing and moving through elements of critical thinking. When students have opportunities to critically reflect, they are able to make sense out of their experience (Kelly & Brandes, 2010; Thomas & Vanderhaar, 2008). In order to interpret the findings of this study, it is important to understand each of the four stages and its relationship to stimulating the cognitive process involved with critical thinking within an academic setting.

### **Triggering the Event**

Triggering the event is the start of the cognitive and critical thinking process. In this phase, students are introduced to the content area and become interested in the topic. To systematically understand how students move through the process of critical thinking, the process known as a “triggering event” (Garrison et al., 2000) occurs. Kalelioglu and Gülbahar (2014) described triggering the event as a time where “an issue, dilemma, or problem that emerges from experience is identified or recognised” (p. 253). Once students are interested in the content and establish initial connections to learning more about the topic, the

event is successfully triggered, leaving room for the next stage, a period and process of exploration.

### **Exploration**

Exploring the topic and content area derived in the “triggering event” phase through a process known as “exploration,” the reflection process and start of engaged discourse begins at this stage. Bai (2009) provided students with the characteristics of exploration from the perspective of the community of inquiry model. This includes presenting various ideas, exchanging information, and contributing to existing perspectives. By including these aspects in the process of exploration, students move toward the integration stage, where they construct new knowledge through discussion and discourse with peers (Garrison et al., 2000).

### **Integration**

The third stage in the process of critical thinking as a means to increasing cognitive presence is integration. It is here where the students have the ability to combine the topics, themes, and content they explore and exchange ideas and viewpoints through the process of discourse. Providing students with opportunities to discuss how they will integrate what they learn is an important part of this stage of cognitive thinking. The goal is for students to experience deeper learning experiences and then apply what they are learning (Alliance for Excellent Education, 2011). From here, students move toward resolution, the final stage in the process.

### **Resolution**

The final stage involves taking what was learned and applying the learning into new settings in the future. During this stage, students should demonstrate deeper levels of cognitive thinking and metacognition. Students continue to need intentional opportunities to think about their thinking and how what they learn will change what they do. Students benefit from having conversations and sharing perspectives with each other and with their teachers. Also, the resolution

stage involves problem solving and reflection. Resolution should lead to action and sometimes modifying and changing practice. During this final phase, the problem that occurred during the triggering phase is resolved (McLoughlin & Maynard, 2009). This resolution may happen either as the student moves on to other settings or within the educational setting itself (McLoughlin & Maynard, 2009). Wei-Yung, Man-fen, and Hsing-Wen (2013) referred to this final stage as the solution stage, where students can apply what they are learning to the real world and also try out and defend their new learning.

### **Method**

A qualitative research paradigm was used for this study. According to Maxwell (2005), qualitative research is a flexible paradigm, with a diversity of validated methods, where data are collected in a natural setting (Creswell, 2009; Patton, 2002). In qualitative research, data are gathered by observing, and speaking with participants directly through structured and semistructured interviews, as well as other direct methods. The researcher served as the key instrument (Creswell, 2009; Jick, 1979; Yin, 1994) in collecting the data. As Creswell (2009) describes, “The researchers are the ones who actually gather the information” (p. 175).

### **Participants**

This qualitative research study was situated in a private, nonprofit university, specifically in the Education and Human Services Division. The participants included 34 undergraduate students working toward a bachelor’s degree in education leading to a certification in early childhood/special education. The 34 participants were students in a science methodology course—teaching pre-K through fourth grade. There were 33 females and one male participant. The course consisted of a hybrid format, with a mix of face-to-face sessions, online sessions, and a service learning component of 15 hours at a community partner site working with children in an urban setting. Service learning is a high-impact

learning strategy where students have the opportunity to go out into the community and provide service and then connect that service to learning outcomes for their course (Trail Ross, 2012). Thus, this study examined how voice-recorded reflections demonstrate cognitive presence in a hybrid course guided by the research question: How does the use of voice-recorded reflections impact critical thinking and deeper learning for students participating in a service learning experience?

### **Procedure**

This qualitative study was theoretical in nature as it followed the framework of the Community of Inquiry (Garrison et al., 2000), in particular cognitive presence. Creswell (2007) notes that a theoretical lens is used often in qualitative research. The participant student responses were examined using the lens of the Community of Inquiry framework. The students' voices were heard through their reflective responses. Within a qualitative study, the researchers gather multiple data sources to support their research (Maxwell, 2008). In this case, the data gathered and analyzed included the VoiceThread reflections and in-class discussions regarding the use of voice-recorded technology to support learning.

VoiceThread is a Web 2.0 tool that has shown to augment and extend reflection experiences, help build higher level thinking skills, and build classroom community (McCormack, 2010). In this study, VoiceThread was used as the tool for allowing students to voice-record their reflection responses. After their final service learning visit, the students were instructed to use VoiceThread to speak or video their responses to instructor-created survey items. The instructor for the course used the voice-recorded online tool to speak the guiding questions using a PowerPoint as a visual aid. Students were provided with specific directions on their class wiki of how to access the presentation, how to sign up for a free account to use the tool, and also how to use the tool once they had an account. This activity was also discussed

in class and one student piloted the activity with the instructor to make sure the tool was easy to use and the instructions were clear.

The guiding questions were as follows:

1. Considering the purpose of the service learning program, describe something that has made an impact on you while taking part in this program.
2. Describe ways you have helped a child in this program.
3. Culturally responsive educators create an environment that is inclusive, understanding of social and cultural norms, built on a constructivist theory, and truly interested in getting to know their students. Reflecting on these characteristics, how has or might this experience help you to be more culturally responsive in the future?
4. Please describe the science lesson or lessons you have integrated and how the children responded.
5. What one thing would you do differently the next time as you reflect on your experience?
6. How can this experience reflect the values of your university? Please explain.
7. Please add any additional comments or thoughts here.

After each student responded to the guiding questions, the researchers transcribed and then coded the data using Garrison et al.'s (2001) four categories of cognitive dimension to guide the analysis: triggering the event, exploration, integration, and resolution. Since the themes were predetermined, the "a priori" coding method was utilized (Stuckey, 2015). The researchers were looking for evidence that displayed students' deeper learning and critical thinking as well as opportunities where students integrated and applied what they learned to other settings.

In addition, the instructor conducted a class discussion regarding the students' use of VoiceThread and asked how using VoiceThread, as a way to reflect, was different than responding in a reflection

paper or on a discussion board. This discussion took place during the final in-person class. The instructor recorded the responses on the board and then took digital photographs of the responses to later reflect on these data.

### **Student Feedback in the Context of the Categories of Cognitive Dimension**

According to Hosler and Arend's study (2012), "Students want to be pushed into more challenging and critical thinking by instructors who direct, encourage, and support deeper levels of critical thinking" (p. 225). The instructor developed guiding questions that were designed to challenge students to think more deeply about their service learning component that was part of a science methodology course. When students experience higher level thinking, they make sense of their experiences and propose solutions or apply what they learn to future situations (Czerkawski, 2014). This sensemaking and applying what they learn to other environments illustrates the resolution stage. As stated earlier, the student responses to the voice-recorded activity were transcribed and coded. The four phases of cognitive presence as defined by Garrison and Arbaugh (2007) were used as a basis for examining themes within student responses. The phases include a triggering event, exploration, integration, and resolution (Garrison & Arbaugh, 2007; Lambert & Fisher, 2013). In order for students to progress through these stages, the instructor needed to provide students opportunities to reflect and practice what they are learning by asking them specific questions (Lambert & Fisher, 2013). What follows is the presentation of student feedback through the context of the conceptual framework.

### **Triggering Event—Understanding the Purpose**

Before completing the assignment, several students did not understand how they would benefit from their service learning experience. This dilemma of students not understanding the purpose of their service learning prompted the idea of using VoiceThread to respond to guiding questions as a way to help

students make sense of the experience and move to deeper learning and meta-cognition. The instructor created question prompts that were designed to lead the students to higher level thinking and reflection. Lambert and Fisher (2013) suggest that instructors “provide scaffolds to ensure that students progress to higher levels of cognition during these activities” (p. 4). Because students were provided with this triggering event (i.e., service learning experience), they were able to begin to think about their experiences, discuss them, and ultimately apply them to future thinking. Within the VoiceThread, a PowerPoint was used as a visual aid, and the first slide of the VoiceThread went over the purpose of the service learning experience to remind students why they were taking part in this experience before they began to respond. When the responses were coded, there were only a few where triggering was identified. Most of the triggering responses were coded in response to question 5: What one thing would you do differently the next time as you reflect on your experience? The instructor purposefully asked this question so students could reflect on the problems they were experiencing and on their own practice.

This student response represents the overall attitude from the majority of students in the beginning of this service learning experience:

I think I had a negative attitude going into this. I would change my attitude and be more positive going into this situation. I became more positive after my first visit. I would go in with a better attitude next time. (Student)

This one response provides evidence of the students’ sense of struggle and puzzlement as to why they were doing this service learning project and how would it benefit them as future educators. It was critical for students to first make a connection to the activity’s purpose and then why it was important for them to participate. It also helped the instructor understand how important it is to discuss the purpose with the

students and then allow them to voice their concerns so they could move to the higher levels of cognition.

Another student stated, “I wish I would have asked what the students were learning to tie to what I was doing with them.” This student identified a clear problem and recognized he or she could do something different to obtain a better result.

### **Exploration—Reflecting on Values and Beliefs**

Students were asked in the guiding questions (1, 2, and 3) to specifically reflect on the purpose of the service learning experience, how they helped one child while they were there, and also reflect on being culturally responsive. This exploration phase, also known as critical reflection and discourse, provided an opportunity for students to explore and discuss their experience. Azer, Guerrero, and Walsh (2013) provided multiple tips for ways to enhance learning and described self-reflection as a way to “recognize underlying personal values and benefits that are represented as professional attitudes and the development of self-efficacy” (p. 438). Many of the student responses demonstrated exploration and included evidence that they were reflecting on their own values and beliefs. A few of the students felt this experience helped them learn how to “think on their feet.” The majority of students noted the benefits of working with a variety of age groups. In addition, students described how welcoming and open the children were at the service learning setting. Some specific student quotes that demonstrate student exploration follow.

One student commented, “These children are not like us—so they all have different traditions as well. Not every child will be celebrating Thanksgiving with a turkey, etc. I want my children to share their stories with one another.” In this response, the student was exploring his or her personal values and beliefs and understanding the importance of creating an inclusive and welcoming environment for all of his or her future students. In order to make changes to actions,

students must first reflect on their own beliefs.

Another student noted his or her lack of readiness and the importance of being open to various settings in the following response. This response is another that demonstrates the second stage of exploration where students are reflecting and making connections to their own beliefs and practices:

After this experience, I did realize I wasn’t exactly ready for the more urban-type setting. So I think going into each different field placement and settings, you have to be very open to the possibility of students from different backgrounds, homes, and cultures. This experience has helped open my eyes, and I need to really get to know them, understand their strengths and weaknesses and find out what makes them who they are. (Student)

This student’s self-reflection illustrates that experiences like these in settings different from what the students are used to are critical to their professional development because of the need to be a reflective teacher who understands cultural and individual differences. Otherwise, our future teachers might be in classrooms teaching with a deficit perspective. Student reflections, such as the following response, further illustrate the exploration of personal attitudes and beliefs: “You can’t always listen to what you hear at the end of the day—all students want to learn and if you respect them, they will respect you.” The response was coded as exploration because the student reflects upon the importance of being aware of biases and of not relying on past stereotypes or prejudgments. All of these are important characteristics of a culturally responsive educator.

Students were asked to reflect specifically on what they would do differently the next time. Students indicated they would be more prepared and have multiple hands-on activities for the children.

Many of the student responses included comments about their practice and how they could improve their practice. One student described how this experience helped develop him or her as a professional:

I was able to work with many different age groups . . . a lot of science lessons I did were informational. I think I overdid the information for the project that I was doing—as a growing professional I have learned what things to do and what not to do.  
(Student)

Because the student reflected on what he or she did, and thought about how he or she would make it better the next time, and shared this information in the response, the researchers coded the response as exploration. This student also demonstrated an understanding of his or her need for reflection and how this will grow him or her as a professional.

Reflection and thinking of how to improve in the future is an important component of developing as a professional as demonstrated in the student responses below. Each response illustrates how these students continued to reflect upon and discuss this service learning experience and what they could have done to improve their performance.

- “Make sure my activities were either longer or shorter. The problem I had was timing—sometimes they would not be long enough while sometimes I went over my time” (Student).
- “I would plan more lessons for the children to do and they could choose. I would try to make a better personal connection with each child. I didn’t get to connect as much as I would like to” (Student).
- “I would provide some learning activity to follow the experiments and make the experiments more difficult and require more reflective thinking” (Student).
- “Practice the lesson before I went into the classroom. This way I would be

less nervous teaching the lesson and I would know exactly what I would be doing. I felt I did not take the time to prepare each lesson like I should” (Student).

These student responses indicate students were thinking about not only what they could do better, but also how they would change what they did. The researchers also noted that students were not afraid to say they could have done better. Students felt comfortable to share their difficulties and knew they would be supported and encouraged. Ensuring students felt safe and comfortable to share during the exploration phase is also an important component of cognitive presence. This kind of reflection on practice leads students to the next level of cognition, as students begin to integrate their thinking into other contexts.

### ***Integration—Applying What They Learned***

When students are able to synthesize and integrate what they are learning into other contexts, this signifies deeper learning (Laird, Seifert, Pascarella, Mayhew & Blaich, 2014). Students constructed meaning of their experience by sharing their initial reactions and how this would help them in the future. Many of the student responses to questions 1, 3, and 5 were coded with constructing meaning and integrating what they were learning. The students noted that the service learning opportunity would help them become better professionals when they have their own classroom. Being culturally responsive is a critical component of being an effective teacher. Students were presented with specific survey questions about how this experience would help them in the future to be culturally responsive. Some of the students noted how their backgrounds differed significantly from the students they were working with and how this experience would help them be more prepared and open in their future classrooms. This student’s response summarized how this experience impacted him or her in relationship to understanding cultural

differences and how an experience like this would help him or her in the future:

I feel that culturally, I have learned about a lot of different lifestyles and ways of life. Going in there, I was completely shocked and I had never seen anything like that before. It was a good experience and I am glad I experienced it now. I found the classroom I was in was great, the teacher was structured, they listened to her and knew what they had to do and when they had to do it. She worked with them on anything they were struggling with. She would do group work and meet with every child. I feel this is really going to help me when I have my own classroom. I feel I have experienced so much that nothing can stop me or get in my way. (Student)

This particular response was coded “integration” because the student was making specific connections to what they learned and how this was going to help them in the future. The student shared how the teacher would do group work and meet with every child. The researchers inferred that the participant student was impacted by what he or she saw so much that he or she would implement similar practice in his or her own classroom.

Students understood how important this service learning experience was and how they needed to take the time to get to know the students they were working with. This student’s response captured the importance of reflecting on their experiences and also on how he or she would apply what he or she learned in the future:

Working with just a few students at a time has helped me to really get to know the students because it wasn’t a full class, so I had time to actually sit and converse with the students I worked with. This will help me in the future because this has taught me that getting to know each and every one of the students

will help me to be successful teaching. I will have to take the time to get to know the students because there will be more of them to get to know rather than just a few.

The participant student demonstrated the cognitive level of integration in the preceding response because he or she indicated the important concept of getting to know students individually and taking the time to do this. The student also indicated this may be difficult with more students, but implied how critical it is getting to know students individually and how that would then contribute to successful teaching.

As students moved into the next cognition level, resolution, they had opportunities to “comprehend and use what they have learned and propose solutions to problems or relate them to other knowledge structures and problems” (Czerkawski, 2014, p. 32).

### **Resolution—Putting It All Together**

McLoughlin and Maynard (2009) described the resolution stage as the final phase when the problem that comes about from the triggering event is resolved. This resolution may occur directly or indirectly (McLoughlin & Maynard, 2009). Several students indicated ways they would use this experience to resolve problems in the future, such as learning to be more flexible, and getting to know their students’ interests and background knowledge. Moving from comprehension to resolution is an important component of cognition (Czerkawski, 2014). Guiding question 7 asked students whether they wanted to add additional comments and thoughts, and this is where most of the resolution responses were coded. Students identified how this experience was different than anything they have done in the past. A few of the students described their service learning opportunity as life-changing and something they would not forget:

I told the teacher when I left that anything she needs during break, I am available and I can come in and

help them with anything they need up until January. I think I grew a lot from this experience, it wasn’t field experience, but it was another experience and I will never ever forget it. I really enjoyed it. The students are so different. They are all unique. There were some troubled students, but this is a good experience. I saw a wide variety of children and how they responded. (Student)

This response was coded as resolution because the student wanted to continue to work with the children even after his or her service learning experience was over. The student mentions how he or she grew from the experience and that it was something he or she would never forget. This response also indicated the type of high impact and deeper learning that service learning can have on participants.

Students compared this experience to other field experiences they had within their program, and this response illustrated the comparison. One student realized how the experience helped him or her prepare for student teaching:

This experience was beneficial. We are so used to going into classrooms and observing and not getting to do things with the students. Coming up with my own activities was very rewarding and I think it was great to figure things out before student teaching.

Deeper learning was evident within the reflection shown next, because the student realized there was much more to this experience than learning how to teach and the greater learning involved being able to connect with students:

I feel grateful for the opportunity to work with the children. It gave me more experience as a teacher. It taught me things other than educational, like being there for a student, things you can do for a student but may not have a subject connection. It taught me that tests

are important and scores are important but it is also important to do things that students enjoy and like.

Another student noted how nervous he or she was in the beginning and then how this opportunity made him or her realize he or she wanted to work in an urban setting:

Going into it I was very nervous because everyone was upset with their placement and frustrated with the class itself, so I thought it was going to be a difficult experience. When I got there I realized it was a great experience. It made me realize I want to work in inner-city classrooms because they need someone that will help them experience things they will not get to experience out of the classroom.

These responses appear to demonstrate the cycle of cognition leading to resolution. For example, the last student response indicated his or her hesitance about the placement, but at the end he or she not only enjoyed the experience but wanted to go back into an urban setting to teach.

When reviewing the coded data, this student’s response really stood out and demonstrated there was something different about this service learning experience embedded within the science methods course:

This was a very meaningful experience to me. I have worked with the children in this extended school program for the last four years; however, this one was more meaningful to me. In past experiences, I always felt rushed and not able to have enough time. I was able to build my self-confidence with the help of the students saying that I was a wonderful helper and they wanted me to come back. I feel like every student in every class should be required to do this because as part of our degree program, we need to do a service learning

project, and what better way to spend an hour and a half of your day any day of the week to improve the lives of a student.

A recurring theme found within the resolution section was that students were able to have hands-on experiences working with children and that these experiences were really going to make a difference for them since they would soon be student teaching. In the preceding response, this student was able to build self-confidence during this experience, which is an important characteristic for future teachers.

The voice-recorded responses demonstrated students moving along the stages of cognition. The service learning experience is a high-impact learning practice where students should experience deeper learning; however, the instructor-created activity intentionally asked students to reflect, share their responses, make connections, and in some cases transform their thinking. Not all student responses indicated the stages of cognition; however, the majority did, and the voices of the students and their cognitive thinking are evident in these responses. Students were also able to hear their classmates' responses and reflect on these as well. Students noted that hearing their classmates' responses helped them to think more deeply and respond more critically.

### ***Final Class Discussion About the Use of VoiceThread***

During the final in-person class session, the instructor discussed the use of VoiceThread with the students as an alternative to a written report or a discussion board and as a way to promote cognitive thinking. The students provided this feedback regarding their VoiceThread participation:

- Allowed for different perspectives.
- Provided a different way of learning.
- Allowed me to be more in-depth about my responses.
- Provided a break from writing.
- Helped get my thoughts into words.

- Helped me by listening to others' responses.
- Helped me gain insight.
- Required me to reflect on learning.

Student responses indicated the use of voice-recorded technology as a way to reflect was a positive experience. Also, their responses indicated the ability for them to express different perspectives plus the important component of being able to hear other students' responses as well. They could not only benefit from their own reflection, but they could benefit from their classmates' reflections too.

### **Implications for Pedagogical Practice**

Using reflection within the online forum appeared to increase cognitive presence in a meaningful and intentional way. Moving from this, there are several implications for pedagogical practice that should be highlighted to inform future work in this area. Reflection can be used to connect students to content and ultimately to aid in growing them as reflective practitioners. Schon (1983) stated that most knowledge is tacit and only emerges once it is activated. Reflection embedded in the process of critical thinking in an act as reflective practitioners allows for an increased understanding, seeing, and ways of knowing of content (Schon, 1983). Students need opportunities to reflect, and in order for the deeper learning to occur, this reflection should lead to the final stage of critical thinking (Ryan, 2013). Garrison et al. (2000) described this final stage as resolution.

Students were guided by the instructor-created questions while reflecting on their experience, sharing their thoughts, and ultimately changing their thoughts related to practice. The guiding questions were developed to scaffold the students' thinking and apply what they were learning to other contexts. If students are not provided with opportunities to do this, even while moving through the various cognition levels, they do not always have an avenue to share their thoughts about learning in such experiences. Because this was a qualitative study, the questions were open-ended and allowed for a

variety of responses; however, the items were intentional in that they were designed to encourage metacognition and reflection. Students also need to feel comfortable sharing even if the results are not what they expect. If students learn they need to improve upon their lesson preparation skills, then they should feel safe to share this and not be penalized for expressing that shortcoming. Therefore, creating an environment where future teachers can feel safe and also where they are encouraged to take risks is pertinent (Moczygemba, 2014; Ryshke, 2012). In order for students to effectively go through the stages of cognition, they need to be open and honest with their experiences. Within this study, students were able to share multiple ways they would change their practice and improve.

Also, the technology tool chosen, in this case VoiceThread, should enhance the learning process and not be included for the sake of using technology. A major outcome of the process of voice-recorded reflection within a hybrid course is the ability to engage in critical thinking and receive a deeper level of knowledge, while using multimedia technologies to translate learning (Redmond, 2014). Proper technology tools need to be available to all students to facilitate reflection practices in online courses. This study leveraged VoiceThread, which contains the ability to voice-record reflections and share with a community of learners. The instructor provided assistance to students and demonstrated in class how to use VoiceThread, and also included a page on the course wiki where students could access more information and videos on how to use this Web 2.0 tool. Ensuring students were comfortable with using the technology helped with their ability to contribute meaningfully. The final class discussion allowed the students to share their thoughts regarding the use of this technology tool and how using this tool in this way helped them to be more reflective. The students stressed that being able to hear other student responses helped them to think deeper and reflect on their personal reflections. This experience also provided them with

an alternative way to share their reflections.

Focusing on cognitive presence through reflection can “assist students to engage in a cycle of reflection and action,” making it a necessary and beneficial part of the overall learning process (Herrington & Oliver, 2002, p. 319). The Community of Inquiry model can be used to improve learning in an online/hybrid course. In addition, the four stages of cognition as described within the Community of Inquiry model served as a framework to evaluate student responses. For this particular study, the focus was on the one area of the inquiry model, cognitive presence, but the other two areas, social and teaching presence, were also important components of this hybrid course and could be areas of research in the future. As future teachers, cultural responsiveness is a critical component that all teachers need to possess. Intentionally asking students to explore cultural responsiveness with instructor-created questions in the context of this service learning experience resulted in multiple responses that indicated students were developing an understanding and ability to be culturally responsive educators. The guiding questions also required students to reflect on what they would change, and responses suggest that students focused on how they would take steps to improve their practice. Thus, the goal of the guiding questions was to provide a scaffold to move the students through the levels of cognition.

### Limitations

The limitations to this study include the fact that the population was limited and consisted of two class sections during one semester of an academic year. In addition, the voice-recorded reflections were fairly short. Longer reflections could have provided more evidence of deeper learning and cognitive presence. Students were also not required to respond to their classmates’ voice-recorded reflection, and this interaction could have added to the cognitive presence within the course.

### Discussion

Since this was first time the instructor integrated a service learning project and used VoiceThread within a science methods course as a way for students to reflect, the process was not seamless. Conducting this research, collecting and analyzing the data, and continually reflecting on this process will hopefully allow for improvement in future courses. Some of the lessons learned include making sure the students understand from the start why they are taking part in the service learning project and the importance of reflection and metacognition during and after the experience. The technology added to the experience by allowing students to reflect and share their voices with the class in a different way—thus, the phenomenological nature of the study. Online discussion forums have been utilized quite often in the past when it comes to asking students to reflect on important course topics. However, there are a multitude of additional technology tools that can be used within online/hybrid courses (Lambert & Fisher, 2013). Voice-recorded technology is one such tool that appears to have potential while examining learning and cognition.

The student responses during the final in-class discussion confirmed the cycle of reflection and action that occurred during this study. This cycle of reflection and action was evident not only during their participation in the voice-recorded assignment but also during the in-class discussion. Adding this in-class discussion was an important component to include as the instructor engaged in the same cycle of reflection and action. This information and feedback will be used to plan for future experiences that lead students to deeper learning and higher level thinking using technology tools.

### Conclusion

When students in a hybrid course were provided with intentional opportunities to reflect on their service learning experience and to apply what they learned to their professional growth and knowledge, many of their responses indicated

deeper learning and included critical thinking. Using technology such as VoiceThread provided a way for students to not only reflect on their experiences but also reflect on other learners’ experiences as well. Cognitive presence as described in the Community of Inquiry model (Garrison et al., 2000) can be a critical component to teaching and learning in a hybrid course. Combining the four stages of cognition with voice-recorded reflections served as an effective way to describe the students’ experiences and ultimately to guide students through reflection and action.

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