

Elevating Teacher Education Programs with Peer Mentor Video Annotation and Feedback

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Video annotation and feedback is an emerging technology in teacher education programs and the professional development of teachers. Little is known about the use of this technology within teacher education peer mentoring programs. This study explores the experiences of two peer mentors in a STEM teacher education program after providing lesson video annotation and feedback to student teaching pairs during a one-semester introductory education course. Peer mentors used a video annotation and feedback tool housed on a university-sponsored teacher induction platform. The results indicate that video annotation and feedback is perceived as a supportive technological tool for pre-service teacher learning. In addition, peer mentors say that video annotation and feedback is useful, but focused feedback limits their response to students. Finally, peer mentors expect that teacher education programs will need to be adapted to take advantage of the benefits of this technology.

Introduction

Video annotation and feedback is an innovative technology that some teacher educators are beginning to employ for pre-service teacher observations. Teachers and teacher education candidates can use this feedback to reflect on and improve their teaching practices. Classroom videos can be used to provide evidence of the presence or absence of specific teaching practices which can be subsequently used for reflective purposes (Rich & Trip, 2011; Rich & Hannafin, 2009). This technology also affords teacher educators and practitioners with the ability to provide time-stamped feedback at specific junctures for recorded classroom lessons. Written, audio, or visual feedback can be added to each time stamp (Rich & Trip, 2011). In addition to time-stamped feedback, users may write summative comments. Before feedback is provided, pre-service teachers and K-12 teachers record their classroom lessons using an app on their mobile device. The recordings can then be automatically or manually uploaded to a designated cloud-based video annotation and feedback platform.

Little is known regarding the uses or potential impact of these tools in teacher education who use curricular support peer mentoring programs (PMPs). In traditional models of curricular support mentoring partnerships, students who are further along in an academic program provide academic support for students who are enrolled in a particular course. Alternatively, PMPs match students with the same level of experience who are enrolled in the same course. It may not be possible for peer mentors within teacher education programs to observe mentees teach in K-12 classrooms. Therefore, video annotation and feedback affords peer mentors with the ability to support the learning of pre-service teachers. Much insight can be gleaned from the experiences of peer mentors as they use video annotation and feedback with pre-service students.

This study explores the experiences of two peer mentors in a STEM teacher education program after providing lesson video annotation and feedback focused on one teaching strategy to student teaching pairs during a one-semester introductory education course. To begin with, recent studies conducted on video analysis and curricular support PMPs are highlighted. Later, the methodology, findings, and implications will be discussed.

Literature Review

Cloud-based video analysis is a relatively new form of technology used by K-12 educators and teacher education programs. Due to rapid advances in video and educational technology, only the most recent studies on video annotation and feedback tools are featured.

Video Analysis

The use of video to support quality teaching is not a recent phenomenon. Video technology in various forms has been used in teacher education programs and in-service training sessions to model best practices and to provide feedback on classroom teaching (Fadde & Sullivan, 2013). Advances in technology have made video annotation and feedback tools a feasible option for professional development and teacher education programs (Rich & Hannafin,

2009). These tools benefit pre-service teachers by providing evidence-based feedback which leads to improvement in teaching practices (Fadde & Sullivan, 2013).

Current studies have looked at the use of video annotation with teachers. McFadden, Ellis, Anwar, and Roehrig (2014) examined the use of video annotation as a tool for developing reflective practices for secondary science teachers who participated in an online teacher induction course. Findings from the study indicated that teachers discussed their own teaching practices and decisions, rather than interactions and behavior of students. In addition, most annotations focused on description and explanation, rather than higher-order reflective practices such as interpretation and evaluation.

Another study examined the impact of video annotation on changes in teaching practices (Tripp & Rich, 2012). This study investigated how video analysis influenced the change process in teaching practices. The findings indicated that participation in lesson video analysis increases teachers' desire to make changes in their teaching practices. All teachers in the study changed their teaching practices as a result of video analysis participation. Teachers supported video analysis because they could focus on specific teaching practices, learn new perspectives, trust the feedback they received, feel more accountable to change their practice, remember to implement changes, and track their own improvement.

Finally, Picci, Calvani, and Bonaiuti (2012) studied teachers' perspectives of video annotation and feedback in professional development. The findings showed that teachers perceived video annotation as considerably more useful than face-to-face professional development because it led to significant improvements in teaching performance. The recent findings from McFadden et al. (2014), Tripp and Rich (2012), and Picci et al. (2012) underscore the importance of this video annotation and feedback for professional learning.

Curricular Support Peer Mentoring Programs in Teacher Education

The current literature is limited related to PMPs developed to provide curricular support. Short (2012) examined the perceptions of peer mentors and mentees regarding the influence of the peer mentoring process on their knowledge and skill level as teachers. The study also investigated the benefits of the program and the challenges faced in a teacher education PMP. The results showed that peer mentors developed mentoring skills and expanded their own teaching practices. Also, the mentees gained knowledge from peer mentors regarding teaching practices. Additionally, Short (2012) found that it was necessary to provide clear expectations for peer mentors and opportunities for professional development.

In another curricular support PMP, Chorba (2013) examined mentoring influenced by relational learning. Relational learning occurs when students, instructors, and mentors reciprocally gain new knowledge through collaboration. The findings indicated that the peer mentors experienced relational learning and became personally invested in the success of their mentees.

Pre-service teacher reflection was the focus of a curricular support PMP study by Le Cornu (2005). Le Cornu (2005) investigated the development of reflective practitioners through the PMP. Within this study, pre-service teachers served as mentors for each other during practicum courses. Le Cornu (2005) found that pre-service teachers in the study developed a mentoring attitude, interpersonal skills, and critical reflection skills. In addition, the pre-service teachers built interpersonal and critical reflection skills through on-campus workshops.

McLoughlin et al. (2007) examined computer-mediated communication (CMC) in a curricular support PMP. In this study, pre-service teachers used asynchronous CMC tools in reciprocal peer mentoring pairs during a practicum experience in a post-graduate program. CMC in this PMP was found to be conducive, flexible, democratic, and dynamic. Furthermore, CMC addresses the needs of pre-service teachers and develops a sense of community. Finally, CMC fostered reflection and prevented isolation during the practicum experience.

Curricular support PMPs were characterized as reflective in both the Chorba (2013) and Le Cornu (2005) studies. Additionally, the studies by Short (2012), Chorba (2013), Le Cornu (2005), and McLoughlin et al. (2007) indicate that reciprocity is a key component of curricular support PMPs.

Methodology

This qualitative study was designed to answer the following research question: What are the experiences of UFTeach peer mentors as they use video annotation and feedback with STEM pre-service teacher education students? A constructivist theoretical framework was applied to this study. Constructivism is a theoretical perspective by which truth and meaning are created through interactions with the world (Gray, 2014). Peer mentors constructed knowledge based on their use of the video annotation and feedback platform and their interactions with UFTeach students during the process.

Context

In the UFTeach program at the University of Florida, video annotation and feedback is currently being used in four courses as a method for students to reflect on their own classroom teaching. Instructors in these courses also use this tool to provide feedback for classroom lessons taught by pre-service teachers.

UFTeach, replicated from the UTeach program at the University of Texas, is an education minor program for math and science majors. Students in the program acquire strong pedagogical skills for teaching math and science concepts and participate in extensive field experiences in secondary classrooms.

The Florida STEM TIPS online instructional coaching platform hosts the videotaped annotation and feedback tool that enables UFTeach instructors and students to use this feature within its course offerings. Florida STEM TIPS, a University of Florida initiative, supports school district induction programs with the goal of retaining new STEM teachers. In addition to

video annotation and feedback, STEM TIPS offers curriculum resources and an online community for pre-service and new STEM teachers. Florida STEM TIPS contracts with Torsh TALENT, a cloud-based platform that supports the recording, upload, storage, and management of classroom videos. UFTeach students record their lessons on the Torsh TALENT cell phone app. Prior to recording lessons through the app, UFTeach students place their mobile devices in a Swivl robot which can follow them around the classroom as they interact with their students.

UFTeach also supports pre-service teachers by recruiting and training peer mentors to work with less experienced peers in practicing beginning teaching skills. Peer mentors in UFTeach are also pre-service teachers who have at least taken the introductory course in the program. Peer mentors support the instructors and guide students in the “Explorations in Teaching Secondary Mathematics and Science” course. For students in this course, peer mentors provide feedback on lesson plans and help them practice lessons before teaching in the classroom. To date, peer mentors have not observed pre-service teachers in secondary classrooms. Furthermore, prior to this study, peer mentors have not used video annotation and feedback to support their mentees.

Participants

Two experienced peer mentors in the UFTeach program served as participants for this study. The two peer mentors were selected based on their experience and availability. Three of the seven peer mentors in the UFTeach program were new, or had less than two semesters of experience. Experienced peer mentors were needed for the study because they needed to be able to compare their video annotation and feedback experience with their UFTeach and peer mentoring experiences. The remaining two peer mentors did not participate in the study due to scheduling conflicts. Pseudonyms are used to identify the peer mentors. Lucy, one of the peer mentors in the study, completed the UFTeach minor, but was allowed to continue serving as a peer mentor until she graduated at the end of the semester that the study was conducted. Susan, the other participant in the study, was also a senior. She was enrolled in her last course of the UFTeach minor program. Both Lucy and Susan served as peer mentors for three semesters prior to this study.

Data Collection and Analysis

Interviews were conducted in order to gain insights into the perspectives of the peer mentors. Interviews were conducted before and after training and implementation of video annotation on the platform. Initial peer mentor interviews focused on their previous experiences as peer mentors in the UFTeach program. Next, the peer mentors were trained on how to provide lesson feedback that specifically focused on questioning strategies to student teaching pairs on the Torsh TALENT video annotation and feedback platform. Each peer mentor was paired with two student teaching pairs. Final interviews focused on the peer mentors’ experiences with the tool and their perceptions of its impact on the mentoring experience with mentees.

Thematic analysis was used to analyze the transcribed interview data. The experiences, meanings, and the realities of participants derived from the interviews will be acquired through

thematic analysis (Braun & Clarke, 2006). This qualitative data analysis method is a systematic process for examining participants and their experiences. Thematic analysis ensures a greater likelihood of accurate interpretation of participants' experiences (Boyatzis, 1998).

Results

Three key themes emerged from the data. First, video annotation and feedback is perceived as a supportive technological tool for pre-service teacher learning. Second, peer mentors say that video annotation and feedback is useful, but focused feedback limits their response to students. Third, peer mentors expect that teacher education programs will need to be adapted to take advantage of the benefits of video annotation and feedback.

Supportive Technological Tool

Both participants discussed the importance of building relationships with mentees. In the introductory UFTeach course, student teaching pairs are required to teach three lessons during the semester in local middle schools. Prior to teaching their lessons, the student teaching pairs sign-up to meet with a peer mentor for a lesson practice session. There are typically four math peer mentors and four science peer mentors with whom the student teaching pairs may choose to meet. According to the participants, these pairs typically choose to work with the same peer mentor in each of the three practice sessions. Susan stated how this transpired during the current semester which helped her form relationships with mentees:

I feel like whenever a group picks a peer mentor, they stick with them throughout the rest of the semester. And that's what happened...all of the groups that I had continuously picked me. I was able to develop a relationship with them and help them out.

Lucy also expressed her belief that multiple peer mentor practice sessions with the groups are beneficial when she stated, "I feel like I have gotten to know a lot of the students more this semester than other semesters. That helps." In her own experience as a mentee, Lucy discussed the reasons why she chose to sign up with the same peer mentor for each practice session:

In my experience, when I signed up for a peer mentor, I always kept the same peer mentor. I randomly signed up with a peer mentor that met my time schedule, and they were great, they were nice, they helped, and so you just keep coming back to them. I think that is probably one of the reasons why students come back to me. Then, eventually you do form a relationship. After that first meeting, they are familiar.

In addition to forming relationships, meeting with the same student teaching pairs consistently ensures that mentees are improving with each lesson. During the current semester, Susan stated, "I had the same groups consistently, so I really got to know them and see them progress from the first to the third lesson. It was good!" Lucy echoed this benefit of meeting with the same student teaching pairs throughout the semester:

I knew what they needed to work on...I knew that they would be reliable and that they would always have a good lesson. And they would ask me questions, but by the second or third lesson, I knew what they were doing. I knew what to expect.

Lucy also expressed the problems associated with inconsistent or single mentoring practice sessions with student teaching pairs:

I feel like I am left hanging a lot of times. Usually when I peer mentor a group, they usually sign up for me for the rest of the semester. I am able to monitor their progress. The second time I always ask them how their first lesson went and it is usually positive but they don't go into so much detail. By that time, sometimes I forgot what I told them, or forget parts of their lesson about what they needed to work on...I ask them questions, but I don't really know how much they changed.

Overall, peer mentors discussed the importance of building relationships and consistently meeting with the same student teaching pairs. According to the peer mentors, student teaching pairs should be matched with one peer mentor throughout the course. Consistency builds trust and stronger mentoring partnerships.

During the first interviews, it became apparent that peer mentor feedback was valued by mentees. Lucy described mentees as “respectful” when providing feedback. She also stated, “...they listen to me. They ask me a lot of questions”. Susan expressed how pre-service teachers relied on her advice in order to succeed in their field experiences:

If people have a significant problem, I ask to meet with them a second time. I give them feedback and things to work on, and then I meet with them again to make sure they actually implemented that feedback...most of the time they take it very well and they kind of take it as a way to improve their grade and they know if they don't listen to me, they are probably not going to do well. Most of them really like it and support it and especially the first time they go out and teach a lot of students and don't know what to do. They welcome any feedback because they know I have experience and I have been in their shoes, and I can help guide them to where they need to go when they don't really understand something.

Student teaching pairs generally value the feedback provided to them by peer mentors because it benefits their academic performance and prepares them to effectively teach middle school students. Pre-service teachers also respect peer mentors because they are farther along in the UFTeach program and have extensive field experiences.

Prior to this study, UFTeach peer mentors were not afforded an opportunity to observe the lessons of mentees in local middle schools. Peer mentors could only observe and provide feedback during peer mentor practice sessions. Participants in the study felt that using lesson video annotation and feedback would be “helpful” [Susan] and provide “another perspective” [Lucy]. Prior to using the lesson annotation and feedback platform, Susan expressed her desire for classroom lesson observation to be used as a method for helping her mentees improve with each lesson:

I think if the peer mentors had the ability to see who they are peer mentoring, you could see how they teach in the classroom. I think a lot of times, students are able to practice when it is just one person...and then you throw them in a class full of 25 students and it's a lot harder. So actually see how they handle teaching in the classroom. I can say, 'I know you're nervous, but you need to take a breath and go slower'...I can see them in action and be able to give them feedback from their first lesson to their second lesson. When they come back to me for the second lesson, I can say, 'This is what you need to work on for this particular lesson.'

Before providing lesson video annotation and feedback to student teaching pairs, Lucy was optimistic about the prospect of using this tool in her role as a peer mentor. She looked forward to the possibility of observing mentees in the classroom in addition to library practice sessions:

I think the student may be more comfortable in the library as opposed to the classroom. Being able to watch the video and see...them publicly speaking to 30 kids. You see them interacting with their teaching partner and you can't look at your laptop. They do that with their (lesson practice) meeting. They have their laptop and lesson plan in front of them and in the classroom they actually have to be prepared and know what they are saying.

Many times, peer mentors pretend to be a student during lesson rehearsal. Lucy discussed how she is able to observe some teaching practices that she is unable to during practice sessions:

The way they interact with students...who they call on. If they favor the students that raise their hands. Or, if they like to give everyone attention, circulating around the classroom. If they are actually contributing as much as their teaching partner if they are running out of time. And then just how they actually teach. If they are great at explaining and interaction with students and making sure they are part of the discussion or not. Just little things like that would make it different.

The participants also expressed the non-evaluative nature of peer mentor lesson video annotation and feedback. Both participants shared their own experiences being mentored in the UFTeach program and described lesson practice sessions as “calming”. The feedback that they had received from their peer mentors grew their confidence. Lucy discussed how her teaching experience in the UFTeach program allows her to provide quality feedback that may not seem punitive to mentees:

I hope that if I'm providing feedback that they see it in a different light than a professor, and that they see that I am not a professional, but I have had enough experience that I know what they could actually do and what is feasible for them at their level.

Susan discussed how her prior teaching experience in the UFTeach program should make her more credible when providing feedback:

...the good thing about peer mentors is that we have gone through the same program, but peer mentors have a little more experience. Using that experience to draw on is great. I

can use the mistakes that I made, or struggles and challenges that I have gone through and warn them, or I went through this same exact thing and this is a great way to handle that situation.

The video annotation and feedback tool made it possible for peer mentors to observe mentees teach in secondary classrooms and provide feedback. Furthermore, this feedback could serve to identify areas of focus for future lesson practice sessions. Lesson video annotation and feedback also provides pre-service teachers with feedback from another perspective. According to the peer mentors in the study, the lesson video annotation and feedback should be welcomed by the pre-service teachers because it is non-punitive and understand that peer mentors have been in their shoes.

Feedback Is Useful

Prior to this study, peer mentors had no previous experience with video annotation and feedback tools. Susan shared her experience with video annotation and feedback by stating, “I thought it was really good. I felt that it was very user-friendly. The platform was very intuitive...like how to add a comment, and you could do overall comments and time-stamped comments in a specific place.”

More importantly, the peer mentors explained that video annotation and feedback provides evidenced-based feedback. Lucy believes that it affords pre-service teachers with the ability to provide specific examples to support feedback, “It is a great way to pinpoint...at the moment you had this question that could have been rephrased differently, or at this moment the student did this. I think it is helpful to look back.” Susan expressed how time-stamped feedback “takes subjective comments and makes them objective which is very helpful...very strong.” She also stated:

Every comment I made was based on what I saw right then and there. And to have that time stamped so that students can go back and watch themselves. And watch from someone who has more teaching experience and be able to catch those problems. And for people to be able to watch that back along with that feedback is really helpful.

The peer mentors in this study favored the use of video annotation and feedback tools within their peer mentoring roles. They felt that the tool was easy to use and provided students with evidenced-based feedback that is not possible with traditional classroom observation forms.

For purposes of the study design, the two peer mentors who provided video and annotation feedback were limited to comments specifically linked to questioning strategies that built conceptual knowledge. Susan felt that focused lesson video annotation and feedback was “challenging” because she did not want to exclude one of the strategies from the participant training for this study. Focused feedback also proved to be challenging for Lucy when she commented, “There were certain times when I wanted to comment on something that wasn’t about questioning.” On the other hand, Lucy discovered that focused feedback provided a learning experience for her:

This was interesting to just focus on what questions they were asking and especially how can we improve those questions...I think that was the most interesting part to try to figure out how you could reword a question, or make it so more students want to answer, or know how to answer.

Susan provided an alternative to focused lesson annotation and feedback:

If you want in-depth, then focus on one of those things. I think it would be fine if you had the peer mentors watch the whole lesson through and maybe instead of doing time stamped feedback...at the end of the video...hey, you were great with questioning, but I think you should work on material management and a more inquiry-based lesson.

Focused video annotation and feedback was a new experience for the peer mentors. The peer mentors discovered that video annotation and feedback was useful and provided evidence-based feedback. Prior to the study, the peer mentors were not limited in identified areas for improvement on lesson plans and lesson practice sessions. Overall, peer mentors felt that focused lesson video annotation and feedback was challenging, but they were able to adjust. Based on the interviews, it seems like the peer mentors would prefer to have the option of providing additional feedback outside of the focus.

Teacher Education Programs Need to be Adapted

The student teaching pairs who uploaded their lessons to Florida STEM TIPS were not required to respond to peer mentor feedback during this study. One of the three uploaded lessons was to be used for a reflective assignment later in the semester. One week had transpired between the time the videos were uploaded and the final round of interviews. During the final interviews, both peer mentors expressed their views on why there was a lack of online dialogue on the part of the student teaching pairs. Susan discussed how student teaching pairs may have been too busy or did not understand what the expectations were for replying to feedback. Lucy explained that the student teaching pairs were not required to reply to peer mentor video feedback. Like Susan, she felt that her comments did not elicit a reply.

Susan placed the onus of responsibility on the program for ensuring that students respond to peer video feedback:

I think that if the program emphasizes...We've provided you with some feedback. We expect you to look at it and think about that while you are writing your next lesson and while you are teaching your next lesson. We don't expect everything to be perfect, but we definitely don't want to see everything the same from your first lesson to third lesson.

Susan also discussed the importance of having student teaching pairs reflect on lesson videos together. In addition, she thought that the feedback provided through lesson video analysis should be used throughout the curriculum:

I definitely think making the students accountable to make them look at the comments and respond is a huge thing. I think you can even...with partners you could even do a thing

where you know each student watches the video and comments and then shares with their partner to see if their partner saw something different than what they saw in the lesson because they are teaching together...to work on things together. Yeah, just including it in the class, including it as part of the curriculum. Maybe in the final project they have to do something with it just so it's not just another piece of information that they can never look at again.

It is unknown why the pre-service teachers did not respond to the peer mentor lesson video annotation and feedback. However, it was evident from the interviews that the peer mentors thought that there should be clear expectations established by the UFTeach program to ensure that pre-service teachers were using the feedback for their benefit. Peer mentors and instructors will need to play an active role in holding students accountable.

Following the peer mentors' experience using video annotation and feedback, they provided implementation advice for teacher education peer mentor programs. Susan suggested that feedback should be aligned with topics that have, or are currently being covered in the course. She stated that feedback from peer mentors should "Go along with what the class is doing..." Susan also expressed the need for reviewing lesson video analysis before lesson practice sessions:

We are supposed to look at their lesson before we practice with them to get an idea of what they are doing. If I got a brand new group for lesson 3, I don't even have to watch their whole video. If I just look at the comments that previously have been made...OK, these are their strengths...these are their weaknesses...so, if I see those same weaknesses when they are practicing with me...I can be like...hey, I saw this from your second lesson, maybe we can do this to work on it.

Susan also saw the value in using lesson video annotation and feedback as a reflective tool for pre-service teachers:

I think if they went back and watched their own lesson and saw the feedback that I put and added any feedback that they thought and replied...oh, I meant to do this...this is what happened...my lesson plans said this and it didn't turn out that way. I think having that reflection as a feature is extremely valuable, and I think being able to carry that reflection to your next lesson and your next education class is awesome.

Several considerations were addressed regarding future planning and implementation of peer mentor lesson video annotation and feedback. First, pre-service teachers should be held accountable for responding to lesson video annotation and feedback. Second, feedback should correlate to what is covered in the course. Third, the lesson video annotation and feedback should be used to identify areas of focus for future practice sessions. Finally, video annotation and feedback can be used as a reflective tool for pre-service teachers.

Discussion and Implications

This study investigated the experiences of two peer mentors in a STEM pre-service teacher education program after providing lesson video annotation and feedback focused on one teaching strategy to student teaching pairs during a one-semester introduction to teaching course. Video annotation and feedback has unlimited potential within teacher education PMPs. Prior to this study, peer mentors only had the capability of providing pre-service teachers with feedback during lesson practice sessions. The peer mentors were encouraged by the many ways in which the use of this technology could enhance their support of mentees.

Several key findings emerged from the interviews. According to the peer mentors, pre-service teachers value any form of feedback provided by peer mentors; however, the peer mentors believed that relationship-building and consistent interactions with mentees was essential. The importance of relationships in the partnerships was similar to that described by Le Cornu (2005). When mentees feel supported, they report increases in performance.

Peer mentors found that the video annotation and feedback tool was user-friendly, and provides evidence-based and accessible feedback for pre-service teachers. The peer mentors also believed that their feedback was non-threatening and helpful for identifying teaching practices that deserve more practice. Based on the findings in Picci et al. (2012), examination of video annotation and feedback should lead to significant improvements in teaching performance.

The results also show that pre-service teachers should be held accountable for responding to lesson video annotation and feedback. McFadden et al. (2014) and Tripp and Rich (2012) supports the notion of holding pre-service teachers' accountable for reviewing and responding to the feedback that they are provided. McFadden et al. (2014) indicated the need for video annotation and feedback in helping teachers develop reflective practices. Pre-service teachers will fail to develop these practices if they do not interact with the technology. Similarly, Tripp and Rich (2012) found that interactions with lesson video analysis led to an increase in the teachers' desire to make changes in their teaching practices.

The experiences of the peer mentors who provided the lesson video annotation and feedback will help to guide future UFTeach PMP planning and implementation. Furthermore, this study may provide the impetus for other UTeach partner schools to adopt video annotation and feedback tools to be used in PMPs.

A limitation of this study was that pre-service teachers were not interviewed or required to respond to the feedback that was provided to them by their peer mentors. Future studies need to be conducted related to the pre-service teachers' perspectives of peer mentor lesson video annotation and feedback. Knowing more about the benefits and usage of this innovative teaching method can help teacher educators improve teaching and learning.

The findings from this study indicate that there is untapped potential for video annotation and feedback beyond the scope of lesson reflection by K-12 teachers. The use of these tools in PMPs provides teacher educators with the possibility for new methods to support pre-service

teachers. Furthermore, teacher educators should use this research as the impetus to implement this technology in innovative ways.

References

- Boyatzis, R. E. (1998). *Transforming qualitative information: Thematic analysis and code development*. Los Angeles, CA: Sage.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101.
- Chorba, K. (2013). *Relational learning: A study of peer mentoring experiences among undergraduate teacher education majors* (Doctoral dissertation). Retrieved from Kent State University and OhioLINK. (kent1385050933)
- Fadde, P., & Sullivan, P. (2013). Using interactive video to develop pre-service teachers' classroom awareness. *Contemporary Issues in Technology and Teacher Education*, 13(2), 156-174.
- Gray, D. E. (2014). *Doing research in the real world*. Los Angeles, CA: Sage Publications.
- Le Cornu, R. (2005). Peer mentoring: engaging pre-service teachers in mentoring one another. *Mentoring & Tutoring: Partnership in Learning*, 13(3), 355-366.
- McFadden, J., Ellis, J., Anwar, T., & Roehrig, G. (2014). Beginning science teachers' use of a digital video annotation tool to promote reflective practices. *Journal of Science Education and Technology*, 23(3), 458-470.
- McLoughlin, C., Brady, J., Lee, M. J., & Russell, R. (2007, November). Peer-to-peer: An e-mentoring approach to developing community, mutual engagement and professional identity for pre-service teachers. In *Australian Association for Research in Education Conference*.
- Picci, P., Calvani, A., & Bonaiuti, G. (2012). The use of digital video annotation in teacher training: The teachers' perspectives. *Procedia-Social and Behavioral Sciences*, 69, 600-613.
- Rich, P. J., & Hannafin, M. (2009). Video annotation tools technologies to scaffold, structure, and transform teacher reflection. *Journal of Teacher Education*, 60(1), 52-67.
- Rich, P. J., & Trip, T. (2011). Ten essential questions educators should ask when using video annotation tools. *TechTrends*, 55(6), 16-24.
- Short, K. G. (2012). *The perceptions of peer mentors and mentees about the process and impact of peer mentoring* (Doctoral dissertation). Retrieved from ERIC. (ED554721).
- Tripp, T. R., & Rich, P. J. (2012). The influence of video analysis on the process of teacher change. *Teaching and Teacher Education*, 28(5), 728-739.