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Enhancing Student Teacher Supervision Through Hybridization: Adding e-Supervision to the Mix

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Abstract

Student teaching is a critical component of the preservice teacher preparation program which has a major role in preparing novices to teach. This capstone experience has been frequently examined and the subject of numerous reform measures. Clinical experiences for preservice teachers have recently seen new recommendations for increased supervisor observational visits to meet accreditation standards. In this study, we sought to determine Iowa State University student teachers' perceptions of a hybridized supervision approach which included an electronic supervision component. Student teachers participated in one of two focus group sessions held during the final on-campus student teacher professional development session. A researcher not involved with the supervision or grading of the student teachers facilitated the interviews. Interviews were later transcribed and analyzed. Three major themes emerged: Benefits to Student Teachers, Improving the e-Supervision Process, and Benefits to the Teacher Education Program. We conclude that e-supervision has the potential to improve the quality of the student teacher experience and the teacher education program. Recommendations for implementation and further research are provided.

Keywords: Student teacher, clinical experience, student teaching, supervision, e-Supervision

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Introduction

Student teaching has long been identified as a critical component in preservice teacher preparation (Zeichner, 2002). Universal across teacher education programs (Anderson & Stillman, 2013), the student teaching experience "enable[s] student teachers to value both theory and practice as equally valid and legitimate sources for shaping their teaching" (Dye, 1999, p. 306). Described as a "centerpiece of teacher preparation worldwide" (Ronfeldt & Reininger, 2012, p. 1104), Borko and Mayfield (1995) maintained that student teaching has "the potential to play a major role in helping novices learn to teach" (p. 502).

The supervision of student teachers during the capstone experience has been considered "a very important exercise in teacher training and development" (Thobega & Miller, 2008, p. 65). Since student teaching has been recognized as a preeminent way of preparing future teachers for complexities inherent to the classroom (Goodlad, 1990), it has become critical to determine ways in which to overcome the challenges of placing student teachers in placements with quality teachers.

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Several challenges have been identified as inherent to the supervision of student teachers. For example, Burrack (2008) identified problems related to providing high quality supervision for student teachers being placed far from campus. "Due to significant management, time, and travel associated with traditional models of field-based teaching supervision, the costs to support such programs in rural schools are high" (Schmidt, Gage, Gage, Cox, & McLeskey, 2015, p. 37).

The Council for the Accreditation of Educator Preparation (CAEP) provides national standards for practice and assessment of teacher education programs. CAEP's mission is to "advance excellent educator preparation through evidence-based accreditation that assures quality and supports continuous improvement to strengthen P-12 student learning" (CAEP, 2015, para. 2). Further, the National Council on Teacher Quality (NCTQ), a nonpartisan research and policy organization, strives to "achieve fundamental changes in the policy and practices of teacher preparation programs" (NCTQ, 2016a, para. 1). The NCTQ standards for teacher preparation included specific standards for elementary, secondary, and special education teacher training. An additional standard for student teaching is also included. In addition to specific indicators for cooperating teacher selection, NCTQ places a heavy emphasis upon the number of student teacher observations required to be conducted by the university supervisor in addition to the spacing of those observations (NCTQ, 2016). NCTQ Student Teaching Standard indicator 14.1 states "[t]he student teacher is observed and provided written feedback at least five times at regular intervals during the semester" (NCTQ, 2016b, Student Teaching Standard Guidance Document, p. 2). Boyd, Grossman, Lankford, Loeb, and Wyckoff (2009) found first-year teachers who graduated from teacher preparation institutions that required a minimum of five university supervisor observation visits during the 14 to16-week student teaching experience had improved student achievement.

Background

A recent change in policy for accreditation of teacher education programs in Iowa was implemented January 11, 2015 (Iowa Administrative Code (IAC) 281 Chapter 79) impacting student teacher observation requirements. The code's accompanying policy procedural guide (Iowa Department of Education, 2015) provided a rule interpretation regarding the new state accreditation rule language: **"**The unit is responsible for ensuring that the student teaching experience for initial licensure: …f. Requires collaborative involvement of the teacher candidate, cooperating teacher, and college/university supervisor in candidate growth. This collaborative involvement includes biweekly supervisor observations with feedback" (IAC 281, Chapter 79, 2015, p. 7).

Although controversial in the national dialogue, Darling-Hammond (2010) suggests that teacher preparation is related to teacher effectiveness. She further indicated that powerful teacher education programs engage university faculty in "actively confronting issues of…transforming curriculum and teaching" (Darling-Hammond, 2010, p. 43). However, engaging teacher education faculty more deeply in field experiences and other aspects of partner schools is not without its challenges. Slick (1997) suggested that student teacher supervision has tended to be an "add-on to what is commonly a full [faculty] teaching load" (p. 822); often without the necessary support to enact the role. Further, Bowman (1979) exclaimed that supervision does not fall under the traditional system of rewards for higher education faculty. Lanier and Little (1986) proffered the existence of an inverse relationship between faculty member's involvement in teacher education and status in the academy. When considering these factors, Koehler (1986) found that many times university faculty exhibited a low level of efficacy for their supervisory role.

However, university supervisors have been found to exhibit a positive effect on the student teacher (Ronfeldt & Reininger, 2012), providing substantial contributions to the student teaching experience (Slick, 1997). For this reason, Agricultural Education teacher preparation programs

typically use faculty to supervise student teachers (Paulsen, Smalley, & Retallick, 2016; Valencia, Martin, Place, & Grossman, 2007). Considering the additional challenges inherent to teacher education faulty and the newly developed accreditation policy in Iowa, a proposal was developed and approved to hybridize the student teacher supervision process by adding an e-supervision component. The intent of this study was to determine student teachers' perspectives of the process.

Theoretical Framework

The foundation of this study emerges from socially shared cognition theory and a framework of behaviors which encapsulates best practices in adult learning and teacher supervision known as andragogical supervision (Ellis & Bernhardt, 1989). Socially shared cognition theory (Blumer, 1969) suggests that human cognition develops from "the role of the environment, the context, the social and cultural setting, and the situations in which actors find themselves" (Thompson & Fine, 1999, p. 279). Based in Knowles (1980) best practices for adult education, andragogical supervision values self-determination of the adult learner in "diagnosing their learning needs, setting their learning objectives, designing plans for meeting their objectives, and evaluating their progress" (Ellis & Bernhardt, 1989, p. 362). Supervisors who subscribe to andragogical approaches to supervision facilitate a professional, collaborative relationship with teachers based upon their needs (Glickman, Gordon, & Ross-Gordon, 2004).

In this study we situate the university supervisor/student teacher supervision experience within adult learning theory and shared meaning making through the use of a hybridized approach for preservice candidate learning. If it is our charge in Agricultural Education to develop "best practices and research-based pedagogies and technologies [to] meet the goal of agricultural education" (Priority 4 of the National Research Agenda: Meaningful, Engaged Learning in All Environments, Edgar, Retallick, & Jones, 2016, p. 39), it should therefore be appropriate to seek agricultural education student teacher perceptions regarding a hybridized instructional supervisory process which includes face-to-face and electronic supervision (e-supervision) strategies.

E-Supervision Protocol

Kopcha and Alger (2014) professed "[t]here is a clear and growing call to improve the supervision of student teachers during the clinical experience with technology" (p. 48). In order to enhance the student teacher supervision process at Iowa State University and to meet accreditation requirements, a hybridized student teacher supervision model which added four e-supervision observation visits to the traditionally implemented three face-to-face visits was developed. E-supervision has recently begun to receive much attention in the literature. Benefits of utilizing e-supervision as part of a hybridized student teaching supervision program include the ability to supervise and provide feedback at opportune times (Burrack, 2008), increase efficiency of supervision (Ludlow, Keramidas, & Landers, 2007), provide quality feedback (Dudding & Justice, 2004*;* Schmidt, Gage, Gage, Cox, & McLeskey, 2015), and provide cost effectiveness over time (Schmidt, Gage, Gage, Cox, & McLeskey, 2015). Additionally, Dymond, Renzaglia, Halle, Chadsey, and Bentz (2008) found that there was no statistically significant difference between remote and face-to-face supervision on performance evaluation scores of student teachers.

Given the positive research and the opportunity to continue a high quality supervision process, we enhanced our current supervisory model with the following hybridized supervisory structure to meet the intent of Iowa's accreditation requirement to utilize biweekly supervisor observations of student teachers. Table 1 outlines the e-supervision schedule that was implemented.

Table 1

Hybridized Supervision Schedule to Include E-Supervision in a 14-Week Student Teaching Experience

Pre-Student Teaching	Face-to-face On Campus Meeting
Week 1 & 2	E-Supervision Observation
Week 3 & 4	Face-to-face Observation
Week 5 & 6	E-Supervision Observation
Week 7 & 8	Face-to-face Observation
End of Week 8	Midterm face-to-face Professional Development (On Campus)
Week 9 & 10	E-Supervision Observation
Week 11 & 12	Face-to-face Observation
Week 13 & 14	E-Supervision Observation
End of Week 14	Final face-to-face Professional Development Session (On Campus)

Each student teacher was provided with an *e-Supervision Technology Kit* that included an iPad mini, a 3-in-1 iPad lens, a wireless microphone system, a tripod with mount, and a carrying case. Each student teacher was given instructions on how to set up equipment and participated in a practice session with her/his faculty supervisor using the equipment. The practice session included an interactive conference with the supervisor following the lesson. Cooperating teachers were prepared to use the equipment as well and were available to assist with the technology during the e-supervision sessions (moving cameras for lab or group work, etc.) as needed. The student teacher was responsible to set-up and test the technology prior to each e-supervision session. All e-supervision sessions were scheduled by the student teacher and faculty supervisor to occur in the two-week window opposite a face-to-face supervisory visit.

Description of Technology

A set of technical requirements needed for the *e-Supervision Technology Kit* was developed. Both system (i.e., technology) and operational (i.e., functional characteristics) requirements were taken into account (Schmidt, Gage, Gage, Cox, & McLeskey, 2015). First, the system characteristics for each kit were considered and steps were taken to insure that the technology components were easy to set up, affordable yet sustainable, and of high quality for audio and streaming capabilities.

Each *e-Supervision Technology Kit* included: 1) iPad mini, 2) 3-in-1 iPad lens, 3) wireless microphone system, 4) mic adaptor, 5) tripod and mount, and 6) carrying case. The cost of the *e-Supervision Technology Kit* was $684 per student, secured through an Iowa State University

instructional technology grant funded by student technology fees. The student teacher was responsible for the initial set-up of the technology in the classroom/learning environment prior to each e-supervision session. Zoom, a cloud-based video conferencing service, was used to connect the faculty supervisor with the student teacher's classroom for the observation and the follow-up conference/discussion with the student teacher and/or cooperating teacher. Iowa State University agricultural teacher education faculty received a Professional (paid) subscription to Zoom upon request through the institution's Instructional Technology department which included an unlimited amount of minutes per session.

Operational characteristics were considered for this e-supervision project in order to anticipate successful implementation. The technology selected was adaptable to a variety of different classroom environments within range of Internet (Wi Fi) access. The system set-up provided an accurate, real-time account of what was happening during the teaching/learning event, so the faculty supervisor could conduct a complete and thorough evaluation and follow-up conference with the student teacher and/or cooperating teacher. In addition, the reliability of system components and streaming capabilities during the observations and conferences were considered. The technology director/coordinator for each school district placement was contacted prior to the student teacher's arrival, to provide assistance to set-up the Internet (Wi Fi) connection and to test a Zoom session.

Purpose

As part of a larger study to explore student teaching triadic member's insights, the purpose of this study was to examine the perceptions of the student teacher regarding e-supervision strategies used as part of a hybridized approach to supervision. The study investigated the use of a hybridized approach to student teaching supervision and was guided by the following research question: *What are student teachers' perceptions of the e-supervision practices experienced with their university faculty supervisors?*

Methods

The population for this case study consisted of a purposive, convenience sample of twenty-four agricultural education student teachers at Iowa State University who participated in a 14-week student teaching experience during the fall of 2015 or the spring of 2016. According to Merriam (1998) a qualitative case study is "an intensive, holistic description and analysis of a bounded phenomenon such as a program, an institution, a person, a process or a social unit" (p. xiii). This case study was situated in the context of a semester-long student teaching experience for agricultural education students over an academic year (2 semesters). The agricultural education student teachers were placed in schools across the state, usually not in close proximity to the university, therefore requiring the need to implement e-supervision practices with their university faculty supervisor. The phenomenon under study focused on the student teachers' perceptions of biweekly e-supervision experiences (observations and feedback) with their university faculty supervisors. Benefits and challenges associated with this approach to supervision from the students' perspectives were also investigated.

After receiving appropriate IRB approval, agricultural education student teachers enrolled in student teaching during fall 2015 and spring 2016 participated in focus group interviews as part of student teaching meetings held on campus. Two focus group interviews were conducted with the student teachers each semester during the midterm (end of Week 8) and final (end of Week 14) face-to-face professional development sessions. A researcher not involved with the direct supervision or grading of the student teachers conducted the focus group interviews using a semi-

structured approach (Wengraf, 2001). Focus group questions addressed were developed from the work of Thobega and Miller (2008) and aligned with the objectives of the study.

Both focus group interviews conducted each semester (fall and spring) with the student teachers lasted approximately 60 minutes. All focus group interview sessions were recorded on a portable device, downloaded, and transcribed. The interviewer took detailed notes during the focus group sessions to help interpret tone and intent of wording used by the participants (Stewart, Shamdasani, & Rook, 2007). Qualitative data were analyzed through thematic analysis procedures (Guest, MacQueen, & Namey, 2012). Open coding (Esterberg, 2002) was used to identify themes of interest shared by the participants. A codebook was created that included interpretations of the text responses and "…systematically sorted [the text] into categories, types, and relationships of meaning" (Guest et al., p. 52). The codes resulted in emergent themes and were then bound by a central definition (Esterberg, 2001). The resulting themes where cross-checked between the two coders following subjective coding procedures and to ensure intercoder agreement (Guest et al. 2012). Audit trails that documented all data analysis procedures and reasoning were kept in an effort to maintain transparency (Guest et al., 2012). Member checking of the transcripts was also completed to insure reliability (Lincoln & Guba, 1985). Since the present study only examined the e-supervision experience perceptions of agricultural education student teachers at Iowa State University—a homogenous population—the generalizability beyond the sample is not recommended. However, results and conclusions from this study add to the student teacher supervision knowledge base and should be considered accordingly.

Results

Three major themes regarding the e-supervision process emerged from the transcribed focus group interviews. These themes included: *Benefits to Student Teachers*, *Improving the e-Supervision Process*, and *Positive Impact on Teacher Education Program*.

Benefits to Student Teachers: Frequency, Flexibility, and Communication

One predominate theme identified during the thematic data analysis process was evidence that this hybridized approach to supervision was benefiting the student teachers in various ways. Specifically, student teachers found that the e-supervision process provided beneficial components which enhanced their student teaching experience. Student teachers appreciated the frequency, flexibility, and communication that resulted from the e-supervised observations.

Frequency. Since student teachers were placed throughout the state, the e-supervision process allowed more frequent interactions with faculty supervisors. As one student teacher remarked, "The more contact and interaction we have the more you can learn" [*Student 03; Frequent Contact*]. Another student focused on the importance of observational frequency on evaluation and added,

> When they were only coming three times they were going to give me a grade based off of the three times they saw me teach. But now, with e-supervision, I would feel more comfortable receiving a grade because they have seen me do more things and apply myself in different ways. [*Student 07; Frequent Contact*]

Yet another student expressed, "It was nice to have just another set of eyes to watch because I really don't feel like it [3 face-to-face visits] would have been enough" [*Student 08; Frequent Contact*].

Student teachers also liked the fact that they knew they could easily contact their supervisor or the supervisor could contact them just to check in and see how things were going, if they needed any help, and to remind them of progress on university requirements (e.g., University Teaching Portfolio). These types of contacts were seen by student teachers as something above and beyond a normal classroom observation visit. One student teacher commented, "I am always looking for suggestions. So, the Zoom thing for me was, the more I could do it the better. I was always looking for ways to improve" [*Student 03; Extra Contact*].

Flexibility. Student teachers also appreciated the flexibility of scheduling the observations and follow-up conferences. Using the e-supervision model, student teachers could plan their lessons and then schedule the observations and conference time with the university supervisor accordingly. As one student teacher shared,

> I was placed over three hours from Iowa State, so coming here multiple times is a hassle for the drive time. Zoom for me was awesome because [University Supervisor] could watch a lesson, and then after school we would meet again and go back over it after school. [*Student 02; Flex Scheduling*]

While another student offered, "We would schedule 'tea times'. At this time, we'll watch the lesson and this time we'll conference about it" [*Student 04; Flex Scheduling*].

Communication. Student teachers also expressed there were opportunities for them to communicate more often with their university supervisor using this approach. The student teachers appreciated that some of their university supervisors would share their observation notes, comments, and questions in an email right after the online observation. That immediate feedback would be a starting place for the student teachers when they met for a follow-up conference with their supervisors. Student teachers found this type of feedback very helpful, as it provided them with time for critical reflection before they discussed anything about the lesson with their supervisor. As one student teacher mentioned, "The ability of the university supervisor to observe our classroom at different times, and then my supervisor would email me his observation notes. I had time to reflect before we talked about those points" [*Student 05; Pre/Post Communication*].

Several student teachers noted they appreciated the timely feedback right after a classroom observation and how easy it was to just "chat" for a few minutes using the videoconferencing set-up. One student teacher stated, "…I thought that the chat at the end that we always had, whether it was three minutes or fifteen, I thought that was really beneficial. So I think that was the most important part" [*Student 08; Pre/Post Communication*]. Another student teacher commented that her supervisor requested that she complete a form prior to her observations listing specific things she wanted the supervisor to observe during the e-supervision sessions.

> So, one thing I really liked…I filled out a sheet beforehand and I specifically asked [faculty supervisor] to focus on things for me, like things I wanted to improve on or things that I maybe have been struggling with or I was frustrated with in the past week… I really appreciated that e-visit because it was more of an informal thing, if that makes sense. [*Student 09; Pre/Post Communication*]

Overall, the student teachers found the e-supervision process very beneficial to their professional growth. Student teachers in the study agreed that their cooperating teacher was primarily the one who was responsible for giving frequent and useful feedback during their classroom experiences. So within that context, they acknowledged that the university supervisors provided additional feedback that would prove useful to their development as a teacher. "More"

did not necessarily mean better for them in terms of professional development. Additional comments from student teachers related to their professional development as teachers included, "The cooperating teachers are there for a reason, they are constantly giving us feedback. Frequent is good, but we need to have time to process" [*Student 03; Useful PD*]. One student teacher added,

> When I compare having another person coming in [non-agriculture university faculty supervisor] as an option instead of e-supervision I think that that would be, I don't want to say too much feedback, but having another feedback session, it's hard for me to process the information and apply corrections in the short amount of time. So, when the professors came three times [face-to-face visits] they could see actual progress. Although I don't have as much experience with e-supervision, it seems like it is useful but not this "full-on" evaluation like someone was there. [*Student 01; Useful PD*]

Another student teacher followed with,

> For me it is like another type of supervision. It's not going to be exactly the same type of evaluation that you are going to get when they come and visit you face-to-face and see your work that way. During the e-supervision they [university supervisor] were able to focus on management and classroom environment and how I was teaching. So, it was like having two different types of evaluation and that is beneficial. [*Student 04; Useful PD*]

Improving the e-Supervision Process

Student teachers shared ways in which the e-supervision process could be improved during the focus group interviews. Findings revealed three specific suggestions that if addressed, might improve the e-supervision experience for student teachers: challenges with technology, clear communication, and pre-determined e-supervision scheduling.

Challenges with Technology. One suggestion for improving the e-supervision experience focused on the challenges student teachers encountered at times using the technology. Even more training is needed on how to use the technology prior to the student teachers going out to classrooms. Student teachers want to be comfortable with the e-supervision technology before they enter the classrooms. Student teachers felt like a lot of the "bugs" (sound, microphones, how to use Zoom, etc.) could have been tested and tried on campus before they entered their K-12 classrooms. Some supervisors/student teachers had a few technical difficulties with the Internet connection, sound, positioning of device for capturing audio and video, and the 3-in-1 lens causing blurring. However, this group agreed that the technology itself did not impede the learning experience, "…I never really had problems with the technology…I thought it was really nice and simple" [*Student 08; Tech Challenges*].

Student teachers commented that other challenges did surface when using the technology in the K-12 classrooms. The technology did appear to be a distraction for some K-12 students in classrooms at first, but the "novelty effect" did seem to wear off in time. As one student teacher stated, "They [K-12 students] seem to forget about it after a while. It's a little bit more of a true representation of how you are managing the students" [*Student 04; Tech Challenges*].

Student teachers commented that their supervisors reported it was difficult at times to hear the K-12 students' questions and responses in the classroom. Student teachers thought having another portable microphone in the classroom would resolve a lot of those issues. Other K-12 student reaction was interesting to note. One student teacher shared, "My students were a little unnerved about using it [technology]. They were not sure why they were being "recorded" or viewed during class" [*Student 01; Tech Challenges*]. One student teacher mentioned that her students wanted to know, "Why is this man watching us?" [*Student 03; Tech Challenges*]. While students in another classroom asked, "Can I go say 'hi' to the man in the camera?" [*Student 05; Tech Challenges*].

One student teacher made an interesting comment about K-12 students acting more like themselves during e-supervision times than when the university faculty supervisor was present and observing in the classroom.

> [I] realized that the students acted more like themselves, like they normally do with just the camera [iPad], than they do when the faculty member was there. Having the actual presence of someone in the classroom makes them change their behavior patterns. [*Student 01; Tech Challenges*]

Clear Communication. Student teachers also shared the need for clear communication between university supervisors, cooperating teachers, and student teachers about the expectations of the e-supervision process. Steps must be taken to ensure that everyone knows the expectations and purposes of the e-supervision sessions. As one student teacher suggested,

> A meeting with the university supervisors, cooperating teachers, and student teachers is so important. If everyone is not on the same page, then it is pointless. Especially with the faculty because they get so busy and some things have to take priority. [*Student 06; Communication*]

Pre-determined e-Supervision Scheduling. Although the student teachers appreciated the flexibility with scheduling e-supervision sessions, they also believed that setting up a pre-determined schedule of e-supervision sessions by assigned weeks at the beginning of the semester is necessary. As one student teacher noted, "Trying to set this up with our really busy professors and getting it to work was difficult. There needs to be a schedule – this are [*sic*] the weeks that e-Supervision sessions will take place" [*Student 04; Schedule times*].

Positive Impact on Teacher Education Program

Student teachers repeatedly mentioned the power and impact of University faculty serving as supervisors. Student teachers majoring in Agricultural Education at Iowa State University have faculty members serve as the university supervisors for their student teaching experience, which is not the case for all student teachers across this institution. This appears to have a powerful and lasting impact on the students because they felt that these faculty members have worked with them from their entrance into the department through the student teaching experience. One student expressed,

Some other majors have people who are just supervisors isn't as productive. Having [Agriculture Education Faculty Member] come see me was beneficial because he could see me and notice the progress that I have made from when I taught in a class here for an assignment versus where I was in the classroom now. And, he knew me better and so he knew what to watch for and what I needed to improve upon. If it is someone who their sole job is to watch us, they may have a

different background [i.e., not Agricultural Education], and they couldn't give us the input that we would really need. The point of it is to give different input than what our cooperating teacher gives us and I think that is a unique thing that we are only going to get from our professors that we have had. [*Student 01; Faculty Supervision*]

Student teachers also acknowledged the potential for e-supervision to provide experiences to inform and improve the agricultural education teacher preparation program at Iowa State University. Building on the idea of having faculty supervise them while they student teach, these student teachers viewed that as a mechanism for improving the teacher preparation program in this licensure area.

We are supposed to be reflecting on our teaching. If they [faculty] are the ones who are teaching our methods and they go in and see that we have no idea of what we are doing while student teaching, they can change what and how they are teaching here [Iowa State] as well. If they never see the outcome of their teaching they can't change it. [*Student 01; Inform/Improve*]

Conclusions and Implications

The student teaching process is a critical component of preservice preparation (Zeichner, 2002). As a result of this study, we conclude that e-supervision has the potential to improve the quality of the student teaching experience. E-supervision is another way to add additional observational visits to the student teaching experience, as it provides a supplementary avenue for the university supervisor to enter the classroom setting in a timely manner. Without physically being present, the university supervisory can more deeply experience the "environment, the context, [and] the social and cultural setting" (Thompson & Fine, 1999, p. 279) of the student teacher's classroom, providing a foundation for a collaborative, andragogical supervisory relationship (Ellis & Bernhardt, 1989). Deeper understanding of the context helps university supervisors facilitate a more collaborative relationship with their student teacher mentee.

E-supervision can help solve problems associated with programs that utilize student teacher placements far from campus (Burrack, 2008; Schmidt et al., 2015). Darling-Hammond (2010) suggested that teacher education faculty should be more actively engaged with schools. Yet the support for these types of activities tend not to be rewarded in higher education (Bowman, 1979). When considering far-from-campus student teaching placements, e-supervision provides university supervisors the opportunity to engage with student teachers and cooperating teachers more frequently. This additional contact with the school provides opportunities to engage with and provide meaning to the teacher education program.

E-supervision can provide a cost-effective way to meet accreditation standards which include increased student teacher observations at regular intervals (Iowa Administrative Code (IAC) [281] Chapter [79], 2015; National Council on Teacher Quality [NCTQ], 2016b). The agricultural education teacher preparation program at Iowa State University has traditionally completed three face-to-face observational visits with student teachers over the course of the 14-week student teaching experience. Teaching, research, and service loads of university faculty, in addition to budgetary restrictions, prohibit additional face-to-face visits. E-supervision provides a practical alternative for additional, fine-tuned observations based on the needs of the student teacher under an andragogical supervisory approach (Ellis &Bernhardt, 1989).

E-supervision can provide important formative feedback for university faculty supervisors and program coordinators to improve the teacher education program. Powerful teacher education programs, as described by Darling-Hammond (2010), use quality standards in program

development—especially in creating stronger clinical experiences. CAEP (2015) teacher preparation accreditation standards require continuous program improvement through data collection and assessment. E-supervision allows for observation and follow-up of student teachers' authentication and internalization of the theory learned in the teacher education program through practice in the student teaching experience, providing teacher education faculty with a data point for formative assessment of the program.

Recommendations

Several recommendations for practice and further research as a result of this study are evident. Our recommendations are shared within the context of research and practice.

Recommendations for Practice

Prior to implementing an e-supervision process, it is imperative that clear communication with the university faculty, cooperating teachers, and students at the assigned placement is implemented so that all stakeholders understand the purpose related to using the technology for e-supervision. Multiple student teachers commented during the focus group interviews that their students seemed uncomfortable because they thought they were being recorded or they did not act normally as they would in class or were distracted by the technology (e.g., waving at the camera). "It was such a distraction, I got nothing done" [*Student 05; Tech Challenges*]. In contrast, a few student teachers mentioned they thought their students behaved better during the e-Supervision time in the classroom. Technology does not have to be a distraction in this situation so communicating the purpose and usage guidelines within the classrooms would appear helpful.

We recommend that a schedule be developed that identifies the implementation window in which e-supervision observations will occur. Student teachers have many responsibilities and get very involved with the day-to-day activities associated with their teaching experiences. Providing a schedule with an identified window for e-supervision sessions to occur would be helpful. These weeks should be identified and shared during the student teaching meeting held prior to the student teachers leaving campus.

Additional improvement in the technology used for the e-supervision experience should be considered. One student teacher used Swivl (from the cooperating school district), an automated rotating tripod, and shared that technology seemed to work very well for e-supervision purposes as the camera would follow the lapel microphone on the student teacher around the classroom and capture more of what the K-12 students were doing and how the student teacher was keeping them engaged. Keeping up with current technologies that will effectively capture classroom teaching episodes is highly recommended and necessary for successful e-supervision results. Several student teachers also noted that it would be helpful to identify a "point person" on campus who would be the contact to help troubleshoot problems that occur with the technology.

Finally, we recommend that proper technology training is in place for the student teachers, cooperating teachers, and faculty members. Student teachers were confident that some of the technical problems they had during the semester could easily have been avoided with just some technical training prior to using in the classroom. A seminar should be developed and implemented prior to student teachers leaving campus to address the technical aspects of using the technology in classrooms and strategies for making the follow-up conversations beneficial to student teacher and university supervisor.

Recommendations for Further Research

We recommend implementing further research into the e-supervision process. It is quite important for the voices of the cooperating teacher and university supervisors to be heard regarding the use and effectiveness of the technology as well as the usefulness of the process. Since agricultural education faculty tend to do the majority of the student teacher supervision in their programs (Paulsen, Smalley, & Retallick, 2016) it would be beneficial to complete a financial cost/benefit analysis of the e-supervision process.

In conclusion, it is important to understand that e-supervision provides numerous benefits to both university supervisors and student teachers; however, the greatest impact might be upon the student teacher. As one student teaches stated,

E-supervision is different than when they come out to your school. They are looking for something; they've seen us, they know what they are looking for; so they will give us something to work on and things to think about. When they view you again they are going to want to see that progress or that change. They are able to be on campus, but still be in our classrooms. I think it is a wonderful thing. [*Student 02; Useful PD*]

References

Anderson, L. M. & Stillman, J. A. (2013). Student teaching's contribution to preservice teacher development: a review of research focused on the preparation of teachers for urban and high-needs contexts. *Review of Educational Research, 83*(1), 3-69. doi: 10.3102/0034654312468619

Blumer, (1969). *Symbolic interactionism: perspective and method*. Englewood Cliffs, NJ: Prentice-Hall.

Borko, H., & Mayfield, V. (1995). The roles of the cooperating teacher and university supervisor in learning to teach. *Teaching and Teacher Education*, *11*(5), 501-518.

Bowman, N. (1979). College supervisor of student teaching: A time to reconsider. *Journal of Teacher Education, 10*(1), 29-30.

Boyd, D. J., Grossman, P. L., Lankford, H., Loeb, S., & Wyckoff, J. (2009). Teacher preparation and student achievement. *Educational Evaluation and Policy Analysis*, *31*(4), 416-440.

Burrack, F. (2008). Using video conference technology to enhance supervision of student teachers. *Academic Intersections. No. 2.* http://edcommunity.apple.com/ali/collection.php?collection=2749

Council for Accreditation of Educator Preparation [CAEP] (2016). *Vision, Mission, & Goals.* Retrieved from http://caepnet.org/about/vision-mission-goals

Darling-Hammond, L. (2010). Teacher education and the American future. *Journal of Teacher Education*, *61*(1-2), 35-47. doi: 10.1177/0022487109348024

Dudding, C. C., & Justice, L. M. (2004). An e-supervision model videoconferencing as a clinical training tool. *Communication Disorders Quarterly*, *25*(3), 145-151.

Dye, V. L. (1999) Is educational theory being valued by student teachers in further and higher education? *Journal of Vocational Education & Training*, *51*(2), 305-319, doi: 10.1080/13636829900200085

Dymond, S. K., Renzaglia, A., Halle, J. W., Chadsey, J., & Bentz, J. L. (2008). An evaluation of videoconferencing as a supportive technology for practicum supervision. *Teacher Education and Special Education: The Journal of the Teacher Education Division of the Council for Exceptional Children*, *31*(4), 243-256.

Edgar, D. W., Retallick, M. S., & Jones, D. (2016) in Roberts, T. G., Harder, A., & Brashears, M. T. (Eds). (2016). American Association for Agricultural Education national research agenda: 2016-2020.Gainesville, FL: Department of Agricultural Education and Communication.

Ellis, N. H., & Bernhardt, R. G. (1989). Andragogical supervision: A supervisory style for adult professionals. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas*, *62*(8), 362-363.

Esterberg, K. G. (2002). *Qualitative methods in social research*. Boston, MA: McGraw Hill.

Goodlad, J. I. (1990). *Teachers for our nation's schools*. San Francisco, CA: Jossey-Bass.

Guest, G., MacQueen, K. M., & Namey, E. E. (2012). *Applied Thematic Analysis*. Los Angeles, CA: Sage Publications.

Glickman, C. D., Gordon, S. P., & Ross-Gordon, J. M. (2004). *SuperVision and instructional leadership: A developmental approach* (6th ed.). Boston, MA: Allyn & Bacon.

Iowa Administrative Code (IAC) [281] Chapter [79] (2015). Standards for practitioner and administrator preparation programs. Retrieved from: https://www.legis.iowa.gov/law/administrativeRules/rules?agency=281&chapter=79&pubDate=01-07-2015

Knowles, M. S. (1980). *The modern practice of adult education: From pedagogy to andragogy*. Chicago, IL: Follett.

Kopcha, T. J., & Alger, C. (2014). Student teacher communication and performance during a clinical experience supported by a technology-enhanced cognitive apprenticeship. *Computers & Education, 72*(1)*,* 48-58.

Koehler, V. R. (1986, April). The instructional supervision of student teachers. Paper presented at the annual meeting of the American Educational Research Association, San Francisco.

Lanier, J. & Little, J. W. (1986). Research on teacher education. In M. Wittrock (Ed), *Handbook of research on teaching* (Third Edition), (pp. 527-568). New York: Macmillan

Lincoln, Y.S., & Guba, E. G. (1985). *Naturalistic inquiry*. Newbury Park, CA: Sage Publications

Ludlow, B. L., Keramidas, C. G., & Landers, E. J. (2007). Project STARS: Using desktop conferencing to prepare autism specialists at a distance. *Rural Special Education Quarterly*, *26*(4), 27-35.

Merriam, S. B. (1998). *Qualitative research and case study applications in education*. San Francisco, CA: Jossey-Bass.

National Council on Teacher Quality [NCTQ] (2016a). Mission statement. Retrieved from http://www.nctq.org/about/

National Council on Teacher Quality [NCTQ] (2016b). Student teaching in the United States. Retrieved from www.nctq.org/edschoolreports/studentteaching

Paulsen, T. H., Smalley, S. W., & Retallick, M. S. (2016). Student teacher activities—are they relevant? The university supervisor's perspective. *Journal of Agricultural Education, 57*(3), 33-54. doi: 10.5032/jae.2016.03033

Ronfeldt, M., & Reininger, M. (2012). More or better student teaching? *Teaching and Teacher Education*, *28*(8), 1091-1106. doi: 10.1016/j.tate.2012.06.003

Schmidt, M., Gage, A. M., Gage, N., Cox, P., & McLeskey, J. (2015). Bringing the field to the supervisor: Innovation in distance supervision for field-based experiences using mobile technologies. *Rural Special Education Quarterly*, *34*(1), 37-43.

Slick, S. K. (1997). Assessing versus assisting: The supervisor's roles in the complex dynamics of the student teaching triad, *Teaching and Teacher Education*, *13*(7), 713-726. doi.org/10.1016/S0742-051X(97)00016-4.

Stewart, D. W., Shamdansai, P. N., & Rook, D. W. (2007). *Focus groups: theory and practice.* (Second Edition). Sage: Thousands Oak, California

Thobega, M. & Miller, G. (2008). Perceptions of supervision practices by agricultural education student teachers. *Journal of Agricultural Education, 49*(3), 12-23. doi: 10.5032/jae.2008.03065

Thompson, L., & Fine, G. A. (1999). Socially shared cognition, affect, and behavior: A review and integration. *Personality and Social Psychology Review, 3*(4), 278-302.

Valencia, S. W., Martin, S. D., Place, N. A., & Grossman, P. (2009). Complex interactions in student teaching: Lost opportunities for learning. *Journal of Teacher Education*, *60*(3), 304-322. doi: 10.1177/2200487109336543

Wengraf, T. (2001). *Qualitative research interviewing: Biographic narrative and semi-structured methods*. Sage: Thousand Oaks, California

Zeichner, K. (2002). Beyond traditional structures of student teaching. *Teacher Education Quarterly*, *29*(2), 59–64.