

Student Teacher Dialogue in an Electronic Community of Practice: Cognition Level Related to the INTASC Standards

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Abstract

Teachers are constantly being evaluated based upon their ability to provide the best education for their students. These evaluations are done at a macro level, where teachers must meet state and national mandates that deem them highly qualified, and at a micro level, where teachers must display proficiency as effective teachers through teacher education standards. Specific to preservice teachers, the Interstate New Teacher Assessment and Support Consortium (InTASC) aligns standards based upon what preservice teachers should know and be able to do. The purpose of this study was to determine the frequency in which student teacher blog posts in an electronic community of practice related to the InTASC standards, as well as determine the average level of student teacher critical thinking displayed in the blog posts related to those standards. Student teachers most frequently blogged about the Professional Learning and Ethical Practices standard as compared to the other nine InTASC standards. It was found that for blog posts discussing InTASC standards, overall critical thinking was displayed at knowledge, comprehension, or application levels. It is recommended that future studies utilize open coding in order to gain a broader insight of the student teachers' discussions.

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Introduction

Teacher preparation programs in colleges and universities throughout the country have traditionally been strategically reviewed by state and accreditation agencies to ensure they are appropriately aligned to credible performance standards (Darling-Hammond, 1999; Edelfelt & Raths, 1998). "Policy makers and stakeholders are calling for better prepared teachers as a means for raising the academic achievement of students in an increasingly diverse society" (Whittington, 2005, p. 90). Goals and expected outcomes for teacher education reform have been established at the national level (e.g., highly qualified teachers established by No Child Left Behind) and the state level (e.g., teacher education standards). Established by No Child Left Behind, preservice, inservice, and experienced teachers are evaluated upon criteria which personify a highly qualified teacher as one who has a bachelor's degree in the subject taught, has full state certification or licensure, and can prove that they are knowledgeable in their chosen subject (U.S. Department of Education, 2005).

The state or national standards a teacher is required to meet may differ depending upon the teacher's status in the profession (e.g., preservice, in service, or experienced) or states' implementation of a specific set of standards. Three of the primary nationally recognized standards that provide guidance for teachers are: the National Council for Accreditation of Teacher Education (NCATE) standards, which serve as teacher education accreditation standards; the Interstate New

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Teacher Assessment and Support Consortium (InTASC) standards, which serve as the initial licensing standards; and the National Board for Professional Teaching Standards (NBPTS), which serve as advanced certification standards (Darling-Hammond, 1997; Kraft, 2001). These standards list the professional, technical, and general knowledge competencies that should be a part of baccalaureate agricultural education programs (Stripling & Barrack, 2013), and “prescribe the attitudes, skills, and dispositions required of all new teachers” (Sands & Goodwin, 2005, p. 818). States are required to measure core content teachers’ qualifications, devise plans that ensure every teacher is highly qualified, and report the states’ progress in meeting these goals (U. S. Department of Education, 2005).

It is expected that preservice teachers demonstrate content knowledge, pedagogical knowledge, and teaching ability (Darling-Hammond, 1997). As faculty and University supervisors assess student teachers on their ability to meet InTASC standards, other researchers have found importance in examining professional identity creation in preservice candidates (Sutherland, Howard, & Markauskaite, 2010). In the coursework found in teacher preparation programs, preservice teachers’ knowledge of teaching and learning is developed primarily through an introduction to educational theories (Sutherland et al., 2010). During the student teaching experience, the preservice teachers’ knowledge of teaching and learning comes from daily practical application in the classroom (Sutherland et al., 2010). For agricultural education student teachers from Iowa State University, this practical daily application occurs in the classroom during the student teaching experience and is assessed using the InTASC standards.

A consortium of over 30 states and professional associations, under the patronage of the Council of Chief State School Officers (CCSSO) (CCSSO, 2011; Darling-Hammond, 2000) developed the InTASC standards, which have been adopted by many accreditation agencies and programs (Olson & Wyett, 2000). These standards “are based on knowledge of effective learning and teaching and on the student learning standards developed by professional associations” (Darling-Hammond, 2000, p. 34). “The InTASC principles were drafted by teachers, teacher educators, and state agency officials, and represent a shared view that reflection is an important skill to be attained by preservice teachers” (Greiman & Covington, 2007, p. 116). The preservice teacher education standards utilized at Iowa State University during the implementation of the present study were based upon the following InTASC standards: 1) learner development, 2) learning differences, 3) learning environments, 4) content knowledge, 5) application of content, 6) assessment, 7) planning for instruction, 8) instructional strategies, 9) professional learning and ethical practice, and 10) leadership and collaboration (CCSSO, 2011).

Edgar, Roberts, and Murphy (2011) recognized the student teaching experience to be an essential component for preservice teachers in agricultural education. This experience “provides prospective [agricultural education] teachers opportunities to apply pedagogical knowledge and skills of teaching in a real-life setting under the supervision of an experienced teacher” (Torres & Ulmer, 2007, p. 1). By immersing preservice teachers in field experiences, they will be better prepared through the process of purposeful reflection and construction of practical knowledge (Pena & Almaguer, 2012; Perry & Power, 2004).

During the student teaching experience, student teachers are expected to participate in relevant (Smalley, Retallick, & Paulsen, 2015) teaching experiences. Smalley et al. (2015) found student teachers determined planning for classroom instruction to be the most important activity of the student teaching experience and evaluation of student performance ranked highest among the relevance of student teaching activities. Paulsen, Anderson, and Tweeten (2015) found that student teachers frequently shared concerns about lesson planning and implementation. Additionally, Torres and Ulmer (2007) found that 26% of agricultural education student teachers’ time was devoted to instructional planning. Though proven to be an integral component of the student

teaching experience, effective instructional planning is only one of many key characteristics of an effective teacher.

Regardless of the discipline, an effective teacher is one who wears many hats and has developed not only content knowledge, but acquired diverse professional skills. An effective teacher is able to implement various pedagogical strategies (Darling-Hammond, 2000), communicate effectively (Garrison, Anderson, & Archer, 2001; Santrock, 2011), understand student development (Council of Chief State School Officers (CCSSO), 2011), employ skills that will keep them up-to-date (Partnership for 21st Century Skills, 2009) in an ever-advancing technological society (Santrock, 2011), is competent in their subject matter (Bransford, Darling-Hammond, & LePage, 2005), is one who reflects (Berggren & Soderlund, 2011; Bonney & Sternberg, 2011; Norris & Ennis, 1989; Pena & Almaguer, 2012; Perry & Power, 2004; Yang, 2009), and is a critical thinker (Bloom, Engelhart, Furst, Hill, Krathwohl, 1956; Norris & Ennis, 1989; Partnerships for 21st Century Skills, 2009; Scriven & Paul, 1987).

The implementation of strategies to increase cognitive skill development in higher education has become increasingly popular and important as educators prepare preservice teachers for real-world issues (Flores, Matkin, Burbach, Quinn, & Harding, 2010; Partnership for 21st Century Skills, 2011; Rudd, Baker, & Hoover, 2000; Whittington, 1995; Whittington & Newcomb, 1993). As preservice teachers utilize critical thinking in developing mini-teaching lessons or presentations for undergraduate courses, it is important that they transfer those higher-level skills to the student teaching experience and further professional settings (Paul & Elder, 2006; Pena & Almaguer, 2012; Perry & Power, 2004). Though effective teachers who utilize higher-order thinking skills in the classroom have been found to positively impact their students' academic achievement (Wenglinisky, 2000), classroom teachers have begun to give up their creative thinking for less imaginative, more routine practices as a result of No Child Left Behind (Moss & Less, 2010). With a seemingly ever-increasing litany of accreditation and standards-based expectations, how can postsecondary institutions continue to ensure that preservice teachers are utilizing critical and creative thinking practices critical to their own and future students' cognitive development?

Conceptual Framework

Teacher education program reform efforts have proved influential in strengthening subject matter and pedagogical preparation preservice teacher education candidates receive, and assist in creating pedagogies and authentic assessments for teacher education that have linked theory and practice, thus changing the ways preservice teachers are being taught (Darling-Hammond, 2006). Darling-Hammond and Berry (2006) determined highly qualified teachers to be those who have certification and licensure in their subject area, are knowledgeable in their subject area, and are competent at teaching it, which is consistent with the criteria proposed by No Child Left Behind (U.S. Department of Education, 2005). Bransford et al. (2005) developed A Framework for Understanding Teaching and Learning (FUTL), which is based upon the core concepts and skills that should be present in the teacher education curriculum, as recognized by the National Academy of Education Committee on Teacher Education.

It is evident that the InTASC teaching standards align with the concepts of the FUTL model (Bransford et al., 2005). A teacher must know and understand how students learn differently. Without this knowledge, a teacher will “lack the foundation that can help them figure out what to do when a given technique or text is not effective with all students” (Darling-Hammond, 2006, p. 4). Teachers are expected to refine their knowledge in developing appropriate student activities, teaching methods, and assessments. As the knowledge of teaching has become excessively expansive, teachers must rely on their ability to research and collaborate in order to meet the dynamic needs of students through continual adaptations in teaching (Darling-Hammond, 2006).

As the FUTL model is analyzed, it can be determined that many of the national and state standards and teacher requirements originate from a “vision of professional practice” (Bransford et al., 2005, p. 11). The importance of highly qualified teachers (U.S. Department of Education, 2005) is displayed in the upper right concept of the FUTL model: knowledge of subject matter and curriculum goals. The knowledge of learners (upper left concept) and the knowledge of teaching (lower concept) are grounded in the InTASC standards (CCSSO, 2011) through which preservice teachers demonstrate proficiency. Within the FUTL model that is displayed as a Venn diagram, the three main components of teacher preparation are interconnected. Without one component, the model no longer exists or fails to assist in preparing effective and highly qualified teachers. Leiby, Robinson, and Key (2013) stressed that “competent, qualified teachers are the backbone of high quality instruction at any level” (p. 180). “Scholars concur that specialized knowledge is clearly essential for practice” (Williams, 2001, p. 28).

Based upon the findings of Darling-Hammond (2000, 2012), Darling-Hammond, Holtzman, Gatlin, and Heilig (2005), and Goldhaber and Brewer (2000), knowledge in content, appropriate preparation within educational departments, and proper certification are the components that should be an ultimate focus for preparing preservice teachers. Bransford et al. (2005) noted the importance of placing preservice teachers in settings where they can apply what they have learned, such as when they “work with other teachers to provide coherent well-grounded curriculum, evaluate and guide student progress using information-rich assessments, and use texts and materials that support thoughtful learning” (p. 4).

Student teachers need to demonstrate growth prescribed within the educational standards in which they will be assessed throughout the duration of their undergraduate experience. More importantly, it is essential to ensure that student teachers are utilizing the student teaching experience for the purposes of practical application (Sutherland et al., 2010) and meaningful reflection (Berggren & Soderlund, 2011; Bonney & Sternberg, 2011; Cakir, 2013; Norris & Ennis, 1989; Pena & Almaguer, 2012; Perry & Power, 2004; Yang, 2009). If preservice teachers reflect regularly during the student teaching experience, can those reflections be evaluated to ensure student teachers are engaging higher-order thinking skills as they work towards demonstrating proficiency in educational standards?

Purpose and Objectives

As part of a larger study, the purpose of the present study was to explore the higher-order thinking skills present in student teacher blog post reflections related to InTASC standards. This research aligns with the American Association for Agricultural Education National Research Agenda Priority Area 4: Meaningful, Engaged Learning in All Environments. More specifically, this research aims to “deepen our understanding of effective teaching and learning processes in agricultural education environments...and examine the role of ...metacognition, and/or reflection in developing meaningful, engaged learning experiences across all agricultural education contexts” (Doerfert, 2011, p. 9). The following research objectives guided this study:

1. Determine the frequency in which student teacher blog posts related to the ten InTASC standards.
2. Determine the relationship, if any, between the average level of critical thinking displayed per student teacher within student teacher blog posts and the frequency with which those blog posts related to the InTASC standards.

Methodology

Agricultural education preservice teachers at Iowa State University are expected to demonstrate their knowledge of the InTASC standards (Crawford, 2014) as a requirement for

teacher licensure in Iowa. This study was employed with all agricultural education student teachers, undergraduate and graduate, at Iowa State University during the fall of 2013 and spring of 2014 ($N = 21$). Appropriate IRB approval was obtained through the Office of Responsible Research to ensure appropriate collection and use of data. The agriculture teacher preparation program at Iowa State University uses technology to enhance the quality of learning (Gilbert & Dabbagh, 2005; Vonderwell, 2002) during this important capstone experience. Agricultural education student teachers were required to develop and submit weekly blogs to a discussion forum housed in the National Association of Agricultural Educators (NAAE) Community of Practice (CoP) private discussion board as part of their regular student teaching requirements. This study analyzed student teachers' blog posts.

Blog, a shortened term for the contraction of web log, is a Web 2.0 technology providing an opportunity for users to be involved in asynchronous discussion. Blogs are convenient for producing and sharing student reflections and offer opportunities for students to communicate within a collaborative learning community (Robertson, 2011). Yang (2009) stated that blogs are a great tool for preservice and student teachers to demonstrate growth and change as they build a learning community. The use of blogs is becoming a popular tool that supports student teacher reflection (Walker, 2005; Williams & Jacobs, 2004).

COPs are often used within educational settings and can occur within public or private discussion boards that allow practicing professionals, such as preservice and inservice teachers, a place to reflect through asynchronous communication (Walker, 2005; Williams & Jacobs, 2004; Yang, 2009). CoPs can help practitioners "solve problems, promote the spread of best practices, [and] develop... professional skills" (Wenger & Snyder, 2000, p. 140).

Bloom et al.'s (1956) Taxonomy of Educational Objectives is valuable for recognizing specific attributes of the levels in which teachers and learners critically process content. The Taxonomy of Educational Objectives (Bloom et al., 1956) recognizes six levels of cognitive abilities and skills: knowledge, comprehension, application, analysis, synthesis, and evaluation. These levels can be divided into higher- and lower-order thinking levels, where analysis, synthesis, and evaluation behaviors comprise higher-order thinking and knowledge, comprehension, and application comprise lower-order thinking (Duron, Limbach, & Waugh, 2006). The Florida Taxonomy of Cognitive Behavior (FTCB) (Brown, Ober, Soar, & Webb, 1970) is an instrument based upon Bloom et al.'s (1956) Taxonomy. Researchers utilize the FTCB to observe teachers' and students' cognitive behaviors in the classroom. The validity of the FTCB (Brown et al., 1970) comes from its direct development from Bloom et al.'s (1956) Taxonomy (Ball & Garton, 2005; López & Whittington, 2001; Miller, 1989; Whittington, 1991; Whittington & Newcomb, 1993). Through the instrumentation of the FTCB (Brown et al., 1970) student teachers' blog posts were analyzed for their level of critical thinking.

Preservice teachers' blog post reflections and discussions were also analyzed to examine which posts addressed InTASC standards, if any, in addition to which standards were addressed. The InTASC standards descriptions as constructed by the Council of Chief State School Officers (CCSSO, 2011) were utilized to code student teachers' blog posts. The InTASC standards provided definitions of terms and a rich description of standard components. These descriptions were regularly consulted during coding process. The InTASC standard descriptions are not a research instrument.

To establish reliability, researchers coded the blog postings three times at four-week intervals (Weir, 2005) utilizing the FTCB. In addition to provisionally coding (Saldaña, 2013) blog posts for critical thinking, each blog post was also coded for the InTASC standards. Provisional coding was used because each level of critical thinking was a predetermined category anticipated from the literature review (Saldaña, 2013), and previous research findings (Bradley, Thom, Hayes,

& Hay, 2008; Garrison et al., 2001; Gilbert & Dabbagh, 2005; Walker, 2004). Intrarater reliability was established as excellent ($\alpha=.93$) when coding the critical thinking blog posts ($N=1,016$).

Simultaneous coding (Miles & Huberman, 1994; Saldaña, 2013) was used to code blog posts for InTASC standards. Simultaneous coding “is the application of two or more different codes to a single qualitative datum, or the overlapped occurrence of two or more codes applied to sequential units of qualitative data” (Saldaña, 2013, p. 80). Saldaña (2013) cautioned researchers that simultaneous coding may attribute to indecisiveness if used excessively, and the researcher should justify the rationale for its use. Simultaneous coding of InTASC was used in this study due to the interconnectedness of InTASC standards, which increased the likelihood of multiple standards appearing in a single blog or discussion post by a student teacher. For example, in a discussion of classroom management and student misbehavior, the student teacher may also note that particular students mature and develop at a differing rate than that of their peers. In this situation, two standards are addressed: *Learning Environment* and *Learner Development*. Moreover, the coding system used for blog posts coded in this study’s objectives were the same as those used in the critical thinking component. This was done so that the researchers could determine potential correlational relationships between student teacher blog posts that discussed specific InTASC standards and the level of critical thinking displayed in the blog posts.

Total student teacher blog posts ($N = 1,016$) were manually coded for identification of InTASC standards. Researchers referenced the CCSSO’s *InTASC Model Core Teaching Standard: A Resource for State Dialogue* (2011) throughout the coding process. Several blog posts had more than one standard coded. Some blogs were general statements and did not relate to any of the standards; therefore, they did not receive an InTASC standard code. The total number of InTASC codes ($N = 1,632$) exceeded that of the actual posts. Posts were coded for InTASC standards three times at four-week intervals. If a standard was recognized as a part of a blog post, but was not coded during the first or second coding trials, the standard code was added to the blog post, and copied into an Excel file.

In order to determine correlational relationships between critical thinking and InTASC standards, only the posts in which critical thinking levels were agreed upon after the three, four-week interval coding periods were used ($n = 942$). All blog posts that were removed from the critical thinking data set were removed from the InTASC data set. Usable codes for InTASC standards were determined ($n = 1,474$). Table 1 displays the total number of blog posts coded, the total number of codes assigned to the blog posts for critical thinking and standards, and the usable codes after the three, four-week coding periods.

Table 1

Summary of Blog Posts Coded for Critical Thinking and InTASC Standards

| Component being coded | Total Posts | Total Codes | Usable Codes |
|-----------------------|-------------|-------------|--------------|
| For Critical Thinking | 1016 | 1016 | 942 |
| For Standards | 1016 | 1632 | 1474 |

Note. Usable codes are those that remained after eliminating blog posts in which critical thinking levels were not agreed upon after three, four-week coding periods. Usable codes were used to calculate the Spearman’s rho correlation.

Spearman’s rho was calculated using IBM SPSS Version 22.0 to determine if a correlational relationship existed between the number of blog posts in which student teachers discussed the InTASC standards and the average level of student teacher critical thinking displayed

within those blog posts. The average level of critical thinking per InTASC standard was calculated. Because the data was ordinal (Urduan, 2010) with critical thinking being coded among six hierarchical levels, each level was given a multiplier (1: knowledge, 2: comprehension, 3: application, 4: analysis, 5: synthesis, 6: evaluation). Preliminary analyses were performed to ensure normality of the data (Pallant, 2013). Data demonstrated true linearity suggesting a relationship between the two variables (Pallant, 2013). Conclusions and implications of this study are limited to the preservice teachers who student taught at Iowa State University during the Fall of 2013 and Spring of 2014; however, teacher education programs similar in nature may obtain insight beneficial for implementation.

Results

Student teachers posted blogs that reflected all ten InTASC teaching standards. Table 2 provides an example of student teacher discussions coded for each standard.

Table 2

Example Blog Posts of Student Teachers Discussions Pertaining to InTASC Standards, and the Level of Critical Thinking Assigned to that Blog Post

| InTASC Standard | Example Blog Post | Level of Critical Thinking |
|------------------------|--|----------------------------|
| Learner Development | <i>Has anyone else had the issue or noticed that high school student cannot spell correctly? I am in utter shock by this! I just watched a class of 7 use small white boards for an activity, and over half of the answers to the questions were spelling wrong. I'm just in awe that spelling has gotten horrible!</i> | Application |
| Learning Differences | <i>I am excited about being able to teach in the classroom, be able to make connections with the students, and to help them learn. I am a little nervous about having to wear the microphone device for a student who has hearing issues, but it will be awesome to be able to have that experience.</i> | Comprehension |
| Learning Environments | <i>8th graders need a new seating arrangement every week. I thought I had made a classroom management breakthrough when [teacher] assigned students to tables, without their friends. Wrong...today it seemed that the students had new found friends and no longer understood what classroom rules were.</i> | Application |
| Content Knowledge | <i>While I may be fairly knowledgeable in soils, conveying that information can sometimes be more difficult that [sic] anticipated.</i> | Evaluation |
| Application of Content | <i>I think if you know the material, you've won half the battle. I think the best soil anticipatory set would be some sort of visual metaphor to help things make sense. Like comparing sand, silt, and clay particle size to that of a basketball, baseball and golf ball...</i> | Synthesis |

Table 2 (continued)

Example Blog Posts of Student Teachers Discussions Pertaining to InTASC Standards, and the Level of Critical Thinking Assigned to that Blog Post

| InTASC Standard | Example Blog Post | Level of Critical Thinking |
|--|---|----------------------------|
| Assessment | <i>I review...the day before an exam... especially if it is an exam I expect 80% or better like the Ag Mech exam I am giving on Thursday! If they cannot successfully pass this assessment, then myself and [teacher] feel they need to re-take it to be able to work on their wood project alone and be in the shop.</i> | Comprehension |
| Planning for Instruction | <i>I am a little worried making lesson plans and figuring out what to do with the other 3 courses right now. The Ag Mechanics course will be mainly project-based, with...individual to small group projects out in the shop...Ag Business is also more of a project-based class with... individual sales projects or interviewing people who are in different agricultural businesses in the area.</i> | Comprehension |
| Instructional Strategies | <i>I try not to go over their heads with the information, but other times I try to explain a concept and they already know what it means before I start telling them. It's difficult to figure out what they already know, and ... they have some idea what [the concept] is but they're unsure. So to help with this struggle we have "Bell-Ringer" questions to start each class. I have 2 questions on the white board or Smart Board...</i> | Synthesis |
| Professional Learning and Ethical Practice | <i>It stinks I couldn't bring any students. I had one senior girl that was able and willing to tag along, but the liability of taking them that far in my own vehicle, and the fact that it would have been smarter to find another student to join us...was too much of a hassle... If you have thoughts on that (or other rules that most teachers should follow...) I would love to hear about them.</i> | Application |
| Leadership and Collaboration | <i>I also had about 5 after-school meetings this week, including an advisory meeting for the [school] department, a school board meeting, and the [district] Ag Teacher's meeting.</i> | Knowledge |

Note. Several of these examples were coded at more than one InTASC standard. These examples may be components of larger blog posts; therefore the level of critical thinking was determined based on the highest level analyzed in the whole blog post.

Professional Learning and Ethical Practices was the standard most evident in student teacher blogs ($n=474$, 29.04%) while Planning for Instruction appeared in 19% of student teachers' blogs ($n=310$). The standard identified least often in student teacher blog posts was Content Knowledge ($n=46$, 2.82%). Table 3 displays the number of blog posts in which student teachers' discussions related to the InTASC standards.

Table 3

Frequency of Blog Posts in which Student Teacher Discussion Reflected the InTASC Standards (N=1,632)

| INTASC Standard | <i>f</i> | % |
|---|----------|-------|
| Professional Learning and Ethical Practices | 474 | 29.04 |
| Planning for Instruction | 310 | 19.00 |
| Learner Development | 196 | 12.01 |
| Instructional Strategies | 178 | 10.91 |
| Leadership and Collaboration | 132 | 8.09 |
| Learning Environment | 128 | 7.84 |
| Application of Content | 62 | 3.80 |
| Learning Differences | 58 | 3.55 |
| Assessment | 48 | 2.94 |
| Content Knowledge | 46 | 2.82 |

Table 4 displays the number of blog posts in which student teachers discussed the InTASC standards and the average level of student teacher critical thinking displayed within those blog posts. Student teachers' blog post discussions relating to Professional Learning and Ethical Practices ($n=188$), Planning for Instruction ($n=118$), Leadership and Collaboration ($n=48$), Application of Content ($n=22$), and Assessment ($n=11$) were most often at the knowledge level. Student teachers' blog post discussions relating to Learner Development ($n=69$), Instructional Strategies ($n=45$), Learning Environment ($n=45$), Learning Differences ($n=17$), and Content Knowledge ($n=12$) were most often at the comprehension level.

The second objective of this study was to determine the relationship, if any, between the average level of critical thinking displayed per student teacher within student teacher blog posts and the frequency with which those blog posts related to the InTASC standards. Spearman's rho was the non-parametric test of choice due to the small sample of student teachers and because the parametric test assumes a random sample (Pallant, 2013). Preliminary analyses were performed to ensure no violations of linearity (Pallant, 2013).

A statistically significant, large, negative correlation (Cohen, 1988) was found between the two variables ($r_s = -.709$, $n = 10$, $p < .022$) with higher numbers of blog posts per each of the ten InTASC standards associated with lower levels of critical thinking displayed within the blog posts related to those InTASC standards.

Table 4

Frequency of Blog Posts at each Level of Critical Thinking per InTASC Standard, and Overall Average Level of Critical Thinking per InTASC Standard (n=1,474)

| Standard | K | C | AP | AN | S | E | Total | Avg. CT Level |
|---|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------------|
| | <i>f</i> (%) | |
| Professional Learning and Ethical Practices | 188 | 181 | 28 | 26 | 6 | 8 | 437 | 1.87 |
| Planning for Instruction | 118 | 98 | 20 | 21 | 17 | 12 | 286 | 2.15 |
| Leadership and Collaboration | 48 | 46 | 12 | 10 | 4 | 6 | 126 | 2.16 |
| Learner Development | 46 | 69 | 29 | 10 | 13 | 4 | 171 | 2.34 |
| Learning Environment | 27 | 45 | 16 | 11 | 5 | 6 | 110 | 2.46 |
| Content Knowledge | 12 | 14 | 5 | 3 | 5 | 3 | 42 | 2.62 |
| Application of Content | 22 | 13 | 4 | 6 | 9 | 4 | 58 | 2.64 |
| Learning Differences | 9 | 17 | 8 | 7 | 0 | 4 | 45 | 2.64 |
| Instructional Strategies | 43 | 45 | 21 | 16 | 22 | 8 | 155 | 2.70 |
| Assessment | 11 | 10 | 7 | 8 | 4 | 4 | 44 | 2.91 |
| Total | 524 | 538 | 150 | 118 | 85 | 59 | 1474 | |

Note. Average level of critical thinking is organized from lowest to highest average critical thinking level. Avg. CT Level = the average level of critical thinking level where 1 = knowledge, 2 = comprehension, 3 = application, 4 = analysis, 5 = synthesis, and 6 = evaluation.

Conclusion and Discussion

The first objective of the study was to determine the frequency in which student teacher blog post discussions related to InTASC standards. It can be concluded that student teachers discuss issues related to Professional Learning and Ethical Practices most often in a CoP because of the ongoing professional development and personal evaluation (CCSSO, 2011) that is expected to take place during the student teaching experience. Professional development is a comprehensive and ongoing process in which “the teacher actively seeks professional, community, and technological resources” (CCSSO, 2011, p. 18). However, the quality of personal evaluation is not what was expected as this standard demonstrated the lowest average level of critical thinking. Student teachers were sharing experiences from the capstone experience without discussing those challenges associated with Professional Learning and administrators’ expectations for implementation. Higher levels of critical thinking may not have been present due to an uncertainty of where to find professional relationships that will provide for the critical reflection feedback needed by preservice teachers. Professional development may have seemed as a practice of the future as pre-service teachers may not have been required to take part in each school districts professional development requirement. Thus, pre-service teachers may have missed the opportunity to witness the methods that experienced teachers use to critically reflect on their teaching, making professional development an uncertain aspect for many pre-service teachers.

Planning for Instruction was the second most highly discussed standard, which would suggest that student teachers regularly conversed about lesson planning and other aspects of instructional planning. However, it was assumed that Planning for Instruction and Instructional Strategies would be the standards most often discussed based upon Moir's (2011) premise as well as the findings of Paulsen et al. (2015), Smalley et al. (2015), and Torres and Ulmer (2007) that curriculum development and lesson planning require the majority of student teachers' focus and time commitment during their student teaching experience.

It was expected that Content Knowledge would not be one of the standards in which student teacher blog posts related to most, as Moir (2011) and Paulsen et al.'s (2015) findings suggested that student teachers were not confident in their content knowledge, and they did not feel safe discussing their content knowledge or lack thereof with their peers in CoPs (Robertson, 2011). This finding may have been due to a couple of underlying factors. The cooperating teacher may have had an influence on the student teachers' application of the InTASC standards, placing more emphasis on professional development and lesson plan development and less on content knowledge during the student teaching experience. Student teachers may also have been timid to discuss content knowledge deficiencies with their experienced cooperating teacher or discuss this matter on the CoP with the fear of appearing incompetent, thus eliminating the majority of content knowledge discussion in general.

The second objective of the study was to determine the relationship, if any, between the frequency of blog posts which related to the InTASC standards, and the average level of student teacher critical thinking displayed within those blog posts. The more often student teachers posted blog discussions related to Professional Learning and Ethical Practices, the less often those discussions demonstrated critical thinking. Students shared their professional activities or ethical practices, but minimally evaluated (Brown et al., 1970) "the needs of the learners, school, and system" (CCSSO, 2011, p. 18) or demonstrated an effort to "build and implement a plan for professional growth directly aligned with his/her needs as a growing professional using feedback from teacher evaluations and observations, data on learner performance, and school- and system-wide priorities" (CCSSO, 2011, p. 18).

In retrospect, when student teachers infrequently discussed Assessment, they did so at a critical thinking level higher than that of the other standards. In Smalley et al.'s (2015) findings, student teachers found evaluation of student performance and the methods of student evaluation to be very relevant to the student teaching experience. Although, students rarely discussed assessment, they did so with critical thought. When considering the lack of blog posts for this standard, the model for this study can be attributed. Consistent with Bransford et al.'s (2005) model, FUTL, it has become more common in agricultural education that students be assessed with more project-based, student-centered evaluations. However, if the student teachers did not recognize and communicate these more student-centered ways of assessment, it may fall back on the preparatory program where the student teachers were not taught new ways of assessment that are arising in our changing agricultural profession. The students may have created more traditional paper-based quizzes, so it stands to reason why discussion may have been so minimal with regards to the Assessment standard.

Implications and Recommendations

As researchers, we must ask ourselves what these findings mean for preservice teachers at Iowa State University. University supervisors should be pleased with the consistency in which student teachers' blog posts related to the educational standards for teaching assessment. Though not all standards were equally represented, there is something to be said that such a high percentage of the total unprompted blog posts related to the InTASC standards. Student teachers will not all post an equal amount of blog posts; therefore, it is recommended that University supervisors set a

specific requirement for the number of blog posts expected over a semester to ensure equality among the student teachers.

Further recommendations suggest that similar studies include a tool to analyze blog posts related to FFA and Supervised Agricultural Experiences. Phipps, Osborne, Dyer, and Ball (2008) noticed the pride agricultural education has taken in providing pertinent learning experiences grounded in the three-circle school-based agricultural education model. In analyzing agricultural education student teachers' reflections as they related to InTASC standards, SAE and FFA discussions are not allotted their own standards that specifically address the advisory role a student teacher will assume for the FFA chapter and the experiential learning concepts of SAE. However, given the integral role of these two components of agricultural education, they can easily fall into any given InTASC standard depending the situation. For example, the student teacher can utilize preparation for a Career Development Events as a form of assessment of the content taught in the classroom.

Smalley et al. (2015) included FFA and SAE components in their student teaching experience activity relevance study. The constructs—which were determined from a compilation of student teaching handbooks in the North Central AAAE Region—recognized in the Smalley et al. (2015) study would serve as beneficial predetermined topic categories in a CoP to enhance higher-order thinking. Predetermined topic categories posted by a CoP facilitator or University supervisor would help maintain organized discussion threads for student teachers, and allow for more focused discussions.

The student teaching experience—and all that it entails—can be challenging and provide obstacles (Knobloch & Whittington, 2002) as the student teacher works through the daily tasks of student teaching and compiles appropriate lessons and artifacts that supports proficiency in each of the InTASC standards. It is recommended that further studies utilize open coding (Saldaña, 2013) of blog posts to determine underlying meaning. What in particular were student teachers discussing with regards to the standards? Does a student teacher's blog post address a concern to keep up with the demands of lesson planning or was it a success story of a behavior management practice? The affective domain (i.e. moods, feelings, attitudes) was not coded as a part of this study and may offer insight into student teacher reflections in online communities of practice in future studies.

Similar to Moir's (2011) phases, it would be useful to determine which standards were discussed during which week (how far into) the student teaching experience, and whether or not these somehow aligned with the phases of student teaching (Paulsen et al., 2015) that mimic those of a first year teacher (Moir, 2011). Perhaps professional development is a topic discussed all semester, but learner development is discussed most often at the beginning of the student teacher experience, when student teachers are initially experiencing the diversity of the students they teach. This could identify the most appropriate times for facilitators or University supervisors to prompt their students with probing questions to aid increased higher-order thinking in online environments (MacKnight, 2000; Garrison et al., 2001) pertaining to the standards in which they must demonstrate proficiency.

Scholars have suggested that reflection and self-critique are critical to teachers' competence (Harris, 1993; Schön, 1995). The use of blogging in a CoP allows agricultural education student teachers to reflect not only on their own growth, but provide suggestions to their peers as well. The CoP also allows for quick and easy facilitation for University supervisors at a distance from the student teachers. It is recommended that further studies be done to test the findings of this paper.

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