INTERSUBJECTIVITY AND DISCUSSION CHARACTERISTICS IN ONLINE COURSES

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This study explores the combination of course structure, prompt type, and characteristics of discussion posts and their relationships with intersubjectivity. A content analysis measured the intersubjectivity of peer responses by analyzing the interaction analysis model (IAM) phase of each post and comparing with the IAM phase of the previous post. Results found that the type of discussion activity generated significant differences in levels of intersubjectivity. Some characteristics of the posts created higher IAM scores, providing clues for the emergence of intersubjectivity. Instructors desiring higher levels of intersubjectivity in discussion forums should consider the course structure and prompt type.

INTRODUCTION

Discussion forums, a unique feature of online and blended learning, have been a staple of distance education as a method of interaction between faculty and learners and between peers. While much research has compared online learning modalities to face-to-face courses, the necessary work in blended and online learning research focuses on effective teaching strategies (Cho & Tobias, 2016; Graham, Henrie, & Gibbons, 2014; Zawacki-Richter & Naidu, 2016) and discussion design (Cho & Tobias, 2016; Howell, Sutherlin, Akpanudo, James, & Chen, 2014; Schindler & Burkholder, 2014; Wang, Woo, & Zhao, 2009; Yücel & Usluel, 2016). One promising concept for supporting rigorous interaction in discussion forums is intersubjectivity. Intersubjectivity, applied online, focuses on the interchange between peers within a discussion thread, encouraging learners to create new knowledge by integrating concepts synergistically in sequences of discussion posts building on each other (Belcher, Hall, Pressey, & Kelley, 2015; Dennen & Wieland, 2007; Hall, 2015). This article proposes that a combination of course structure, prompt type, and characteristics of the posts provide clues to the emergence of intersubjectivity within the discussion forum.

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Intersubjectivity has been used in sociocultural literature as a label for the experience of negotiating meaning, often through disagreement, until the construction of new knowledge is achieved (Matusov, 1996; Steffe & Thompson, 2000). Bober and Dennen (2001) applied the concept of intersubjectivity to online graduate courses, suggesting computer mediated instruction is particularly useful for fostering intersubjectivity. While the technology is important for facilitating the threaded discussion, the learner-centered environment makes room for greater peer interaction and increased possibility of the social construction of knowledge. Others have also extended the concept of intersubjectivity to the online format, arguing that effective online instructor facilitation can transform interaction to intersubjectivity as a higher level of construction of knowledge and shared meaning (Dennen & Wieland, 2007; Hall, 2010; Hara, Bonk, & Angeli, 2000; Lee, Kim, & Kim, 2014). Expanding the definition of intersubjectivity applied in online delivery, Hall (2015) advocated for intersubjectivity defined as the "synergistic progression from individual contributions to sequences of interdependent contributions within the discourse" (p. 425). Intersubjectivity may be evident in quality small group work online as learners negotiate shared meaning and create a product together (Lin, Chen, & Chen, 2013), but knowledge coconstruction reaching intersubjectivity may be easier to achieve in theoretical knowledge courses (Lim & Hall, 2015). Sequences of interdependent contributions are observed online in the interchange occurring in a discussion thread (Suthers, 2006). This study takes the emerging concept of intersubjectivity further by analyzing characteristics and clues within the discussion forum at the emergence of intersubjectivity.

In this study, the combination of course structure, prompt type, and characteristics of the discussion posts are analyzed for evidence of a progression from individual contributions to interdependent contributions as intersubjectivity emerges. Other research has explored aspects of the structure and design of discussion forums, finding that instructionally rich discussion forums facilitate better student outcomes (Darabi, Liang, Suryavanshi, & Yurekli, 2013). Others found requiring learners to write their initial post before reading their peers' posts was effective for critical thinking regarding alternate viewpoints (Morrison, Watson, & Morrison, 2012). Scaffolding, such as the instructor or peers marking important discussion sentences, supports learners in reaching higher levels of knowledge construction (Eryilmaz, Thoms, Mary, Kim, & van der Pol, 2015). While providing guidance for elaboration within the discussion is helpful (Curry & Cook, 2014; Dixon, 2014), designing specific discussion forum activities such as debates (Gunawardena, Lowe, & Anderson, 1997; Jeong, 2004), problem solving (Hou, Chang, & Sung, 2008), and role play (Hou, 2012; Jeong, 2003) can draw out alternate views and encourage learners to engage with the content critically and deeply. Providing learners more time to continue the arguments and keep the discussion thread alive (Jeong, 2004) may also support higher levels of critical thinking. Teaching learners online listening skills, and how to response integrating multiple peers' ideas, may also result in more meaningful and rigorous online discussions (Wise, Speer, Marbouti, & Hsiao, 2013).

The discussion prompt continues its importance in quality online discussions. Many instructors write the prompts for online courses; however, learner-led facilitation of online courses can increase learner understanding of leadership, facilitation, and how to create a positive atmosphere online (Milman, Hillarious, & Walker, 2012). Either way, clear instructions for learners (Darabi & Jin, 2013) combined with instructor interventions such as modeling, questioning, and subsequent prompts (Spatariu & Winsor, 2013) are essential. Research is needed to understand if learner or instructor created prompts may be more effective in facilitating the achievement of higher levels of intersubjectivity. The critical thinking requirement of the discussion prompt may also affect the achievement of

higher levels of intersubjectivity. Questions that provide room for learners to progress higher, such as less divergent questions generate more learner responses and higher levels of critical thinking (Ertmer, Sadaf, & Ertmer, 2011). Some research has coded the peer responses for the cognitive level of Bloom's taxonomy (Schindler & Burkholder, 2014), but others have coded the prompt to determine the level of Bloom's taxonomy (Howell et al., 2014).

PURPOSE OF THE STUDY

The pursuit of quality in online discussions continues to challenge faculty and administrators (Nandi, Hamilton, & Harland, 2012). Parker (2004) suggests "the greatest challenge for trying to define quality in any product or service is that quality remains a relative experience, realized in large part through an individual's level of expectation" (p. 387). Researchers pursue the development of good quality discussion (Armstrong & Thornton, 2012), the support of critical reflection (Gulbrandsen, Walsh, Fulton, Azulai, & Tong, 2015), the increase of learners' ability to participate in the discussion (Sherblom, Withers, & Leonard, 2013), and the challenge of generating learner interest in the discussion (Han & Crooks, 2013). This study examines the relationship between course design, participation factors, and the emergence of intersubjectivity.

Research Questions

1. What is the relationship between the course structure (discussion activity type, length of segment) and intersubjectivity (lower/higher/same)?
2. What is the relationship between different types of discussion prompts (who started the thread, Bloom's level) and intersubjectivity (lower/higher/same)?
3. What is the relationship between the characteristics of the previous posts (interaction analysis model of previous post, words in previous post) and intersubjectivity (lower/higher/same)?

METHODS

Research Design

This study used a quantitative content analysis research design to analyze discussion forum posts as defined by the post author (Jeong, 2014; Neuendorf, 2002; Rourke, Anderson, Garrison, & Archer, 2001). The research focused on peer response message pairs, including replies triggered by a peer's first response to the instructor. Instructor posts were not included. Intertwined action-reaction sequences display the interaction between learners as they build on each other's posts (Dennen & Wieland, 2007; Suthers, 2006; Walther, Gay, & Hancock, 2005).

Research Context

Data presented were collected from one section of a graduate online worldview course offered for two semester credits through a private university in the Midwest attracting learners from all over the United States, Canada, and internationally. Learners wrestled with the purpose of education, the nature of knowledge and worldviews, and the program's philosophical foundations. Learners worked toward a final philosophical foundations paper articulating their worldview and making connections between their worldview and their own leadership.

The 20 learners in the course were studying in master's and PhD online leadership programs. They lived in Canada, Germany, Hong Kong, and the United States and worked in diverse leadership roles including business owners, communication director, educators, organizational administrators, pastor, social worker, and treasurer. Eleven learners were male and nine learners were female.

The discussion-oriented course was divided into five segments, each 3 weeks long. The

instructor called the segments "chunks" within the course. Each segment began with 2 weeks of reading and discussion, ending with a quiet week for learners to reflect and write on their own worldview. In the first three segments of the course, learners dialogued regarding the purpose of education and the nature of knowledge, reviewed diverse worldviews, and applied worldviews to different philosophies. In the fourth segment, learners worked in groups to research and adopt an assigned worldview, and then debated the worldviews in role play mode as they responded to varied situations from the point of view of their assigned worldview. In the final segment, learners responded to prompts to evaluate and review their work within the course. The instructor played an active role within the discussion forum by posing questions, redirecting thinking, encouraging learner reflection, and sharing resources. The syllabus requirements for the discussion forum required three to four substantive posts per week, with no numerical requirements for words per post or for number of peer responses. Points were allotted for posting during the required time frame, both early and later in the week. The dialogue rubric valued posts building on previous posts, extending the conversation, giving examples, creating metaphors, and defining issues (see Appendix A for a copy of the rubric).

Identifying Peer Responses

Discussion forum posts were analyzed for the sequence of the conversation and in relationship to each other. Peer responses were defined as discussion posts in response to one or more classmates and did not include responses to the instructor. Response sequences were usually indicated by indentation created by Moodle, the learning management system, within the individual discussion forums. However, sometimes the learner's use of the Reply button did not clearly indicate the response sequence; for example, a learner may have replied naming one classmate when the peer response appeared to reply to a different classmate. Thus, the classmate named in the response was also used to determine the response sequence. Social and off topic posts were excluded from the data set (Gunawardena et al., 1997; Henri, 1992). The first author coded the posts for response sequences, and then the second author coded 10% of the response sequences to check for interrater agreement. The initial interrater agreement was 90%; after discussion, 100% agreement was reached.

After peer responses were identified, the relationships between peer responses were analyzed to identify initial posts, previous posts, and subsequent posts (Dennen & Wieland, 2007; Suthers, 2006). The definition of the terms is important in understanding the study. An initial post was created by the instructor or by a learner to begin the discussion thread. A previous posts, as used in this study, meant the post that came before the one being analyzed; the previous post could be an initial post for the discussion thread or a subsequent post. Subsequent posts were always peer responses; instructor subsequent posts were not analyzed.

Measures of Intersubjectivity

The interaction analysis model (IAM) phase of the peer response in relationship to the previous post was utilized to measure intersubjectivity (Gunawardena et al., 1997). The IAM was chosen due to the strength of the existing protocol (Hall, 2011; Rourke & Anderson, 2004) and the high levels of interrater reliability (Lucas, Gunawardena, & Moreira, 2014). The IAM tracks learners flowing across five phases as they construct knowledge: (1) sharing and comparing; (2) exploring disagreement; (3) negotiating new statements of coconstruction; (4) testing proposed synthesis; and (5) summarizing agreement, applying, and metacognitively reflecting. The IAM meets the standard of a reliable coding scheme (Garrison, Cleveland-Innes, Koole, & Kappelman, 2006), containing meaningful categories, discernable indicators, and manageable mes-

sage units such as distinct discussion forum posts. The IAM phases include specific indicators, which coders use to determine the phase(s) of the peer response. If a discussion post demonstrated indicators of more than one phase, the post was coded for the highest phase, as recommended by previous research (Beaudrie, 2000; Gunawardena et al., 1997; Luebeck & Bice, 2005; Marra, Moore, & Klimczak, 2004; Onrubia & Engel, 2009). The IAM phase of one post was compared to with the IAM phase on the previous post to code each peer responses as reaching higher, the same, or a lower level on the IAM scale. Emerging intersubjectivity was indicated by peer responses in subsequent posts rated higher on the IAM scale than the previous post. Each IAM phase was considered part of the progression toward intersubjectivity.

Three researchers analyzed the data to determine the IAM phase of the discussion posts. The second author trained the researchers on coding the IAM phase. Two researchers coded initially and the first author coded a random selection of posts for interrater agreement. Following coding procedure (Marra et al., 2004), the researchers read each discussion thread sequentially and examined each initial post and peer response ($n = 591$) to identify the IAM phase. The peer responses were the main focus of this study ($n = 461$); however, initial posts responding to the discussion prompt or creating a new prompt were coded to understand the peer responses. Interrater differences were addressed using a negotiated protocol used in IAM research (Garrison et al., 2006; Gunawardena et al., 1997; Marra et al., 2004). After all of the posts were coded, the first author independently analyzed a random 10% of the peer responses. The initial interrater agreement between the authors and the third researcher was 45%. The researchers discussed the discrepancies and worked independently to code another ten posts. The researchers then achieved 70% interrater agreement, and in discussion of the second set of discrepancies, the researchers came to 100% agreement on the coding. After this procedure, it became clear that initial posts in response to the discussion prompt were necessary to identify the beginning of the response sequence. Following the same procedure, the first set of instructor responses achieved 67% interrater agreements; and discussion resolved to 100% agreement. This negotiated method is recommended for content analysis where some researchers are new to the coding rubric (Garrison et al., 2006).

Other Measures

Several data points were collected on each peer response to understand the relationship between course structure, characteristic of the prompt, characteristics of the posts, and the emergence of intersubjectivity. The course structure components measured were the type of segment and the week of the segment. Each peer response was coded for segment type using the type of activity occurring during that segment: dialogue, role play, or reflection. Each segment was 3 weeks long, with 2 weeks of discussion followed by a silent reflection and writing week. Each peer response was coded for week of the segment it was posted within (first week, second week, or late posting).

The characteristics of the prompt were also analyzed to understand the relationship with emerging intersubjectivity. Two characteristics were examined: type of prompt and the Bloom's taxonomy level of the prompt. Each peer response was coded by type of prompt based on who initiated the discussion thread, indicating whether the starting post was an initial instructor prompt, a subsequent instructor prompt, or a learner created prompt. In addition, each peer response was coded by the Bloom's level of the prompt starting the discussion thread.

The characteristics of the posts were coded to better understand the relationship with emerging intersubjectivity. Each peer response was coded to indicate whether the peer response was at the same, higher, or lower level of the IAM when compared to the previ-

ous post. The number of words and number of citations measured peer response length and use of resources. Peer responses naming peers from multiple previous posts were also binary coded, 1 for multiple; 0 for responding only to one post.

RESULTS

In this section, the results of this study are shared. The descriptive statistics showing the variation in IAM phases within the peer responses of the course are shared followed by analysis of how the course structure, characteristics of the prompt, and characteristics of the previous post are related to the emergence of intersubjectivity within peer responses as measured by increasing scores on the IAM scale.

In Table 1, descriptive statistics are shown for the IAM phases, showing the majority of posts at Phase 1: Sharing and Comparing. Most of the peer responses were either at the same phase as the previous post, or a higher phase than the previous post.

Course Structure

In Table 2, the results of the first research question are shown. What is the relationship between the course structure and emerging intersubjectivity? The aspects of course structure examined in this study were the type of discussion activity in each segment and the length of each segment. A chi square test of goodness-of-fit was performed to determine whether the type of segment activity within the course generated different levels of peer responses. A significant difference was found between the types of discussion activities χ^2 $(4, N = 461) = 25.196, p > .000$. In Table 2, the percentages are shown as well as frequencies to account for the different amount of segments using a discussion activity. The three dialogue segments of the course generated peer responses that were lower, the same, or higher, with more peer responses at the same or higher level of the IAM phase. In the role play, the learners were staying in their role, so they often disagreed with each other. Learners moved more quickly to Phase 2 (Dissonance) (higher), and then remained at Phase 2 as they discussed the concepts with each other (same) while remaining true to their role. This result is also shown in Figure 1 with the percent of posts in each type of segment. The course had three segments of dialogue, one segment of role play, and one segment of reflection.

A second chi square test of goodness-of-fit, with results shown in Table 2, was performed

TABLE 1
Interaction Analysis Phases and Comparisons

Measure	*n*	*Percent*
IAM Phase of the Posts Analyzed		
Phase 1: Sharing and Comparing	414	70.1
Phase 2: Dissonance	131	22.2
Phase 3: Negotiation and Coconstruction	38	6.4
Phase 4: Testing Tentative Constructions	2	0.3
Phase 5: Statement and Application of Newly Constructed Knowledge	6	1.0
IAM Phase of Peer Response		
Response is at a lower IAM phase than the previous post	77	16.7
Response is the same IAM phase as the previous post	261	56.6
Response is at a higher IAM phase than the previous post	123	26.7

TABLE 2
Cross Tabulation of the Course Structure and Peer Response Level

Groups		*Response Is Lower*	*Response Is the Same*	*Response Is Higher*
Type of Segment				
Dialogue (3 segments)	Count	70	199	83
	Percent within type of segment	19.9	56.5	23.6
Role Play (1 segment)	Count	7	45	38
	Percent within type of segment	7.8	50.0	42.2
End of Course Reflection (1 segment)	Count	0	17	2
	Percent within type of segment	0.0	89.5	10.5
Week of Segment				
Posts in the first week	Count	29	136	59
	Percent within week of segment	12.9	60.7	26.3
Posts in the second week	Count	48	107	60
	Percent within week of segment	22.3	49.8	27.9
Late posts	Count	0	18	4
	Percent within week of segment	16.7	81.8	18.2

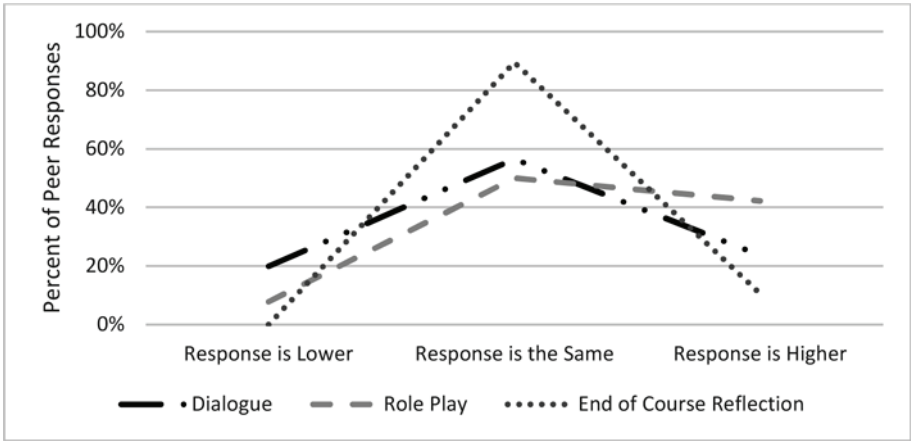

FIGURE 1
Peer Response Level in Each Segment Type

to determine whether the week of the post generated different levels of peer responses. The course was organized into five segments of 3 weeks each, with the third week designated for silent reflection. A significant difference was found between the weeks of the segment χ^2 (4, N = 461) = 15.277, p = .004. Figure 2 shows that the late posts were most likely to be at the same level as the previous post. The posts in the second week produced the least amount of variance in the percentage of posts between lower, same, and higher levels.

Characteristics of the Prompt

In Table 3, the second research question is addressed. What is the relationship between different types of discussion prompts and

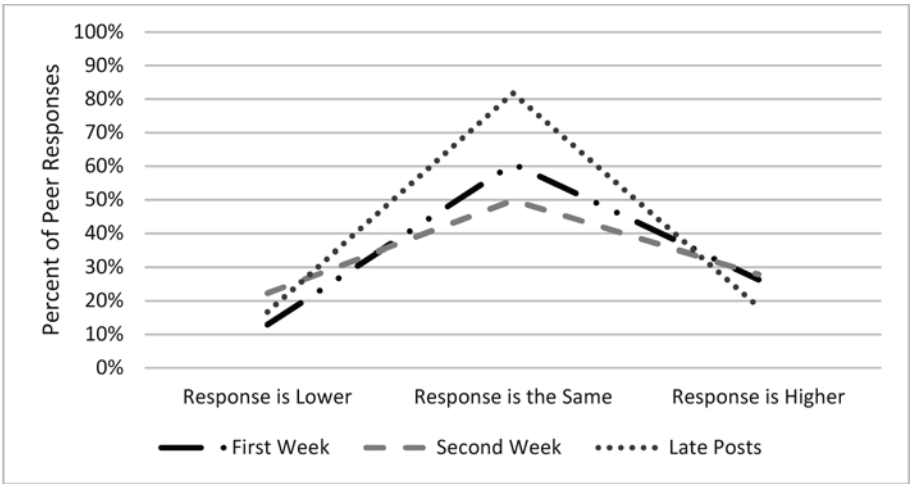

FIGURE 2
Peer Response Level by Week of Segment

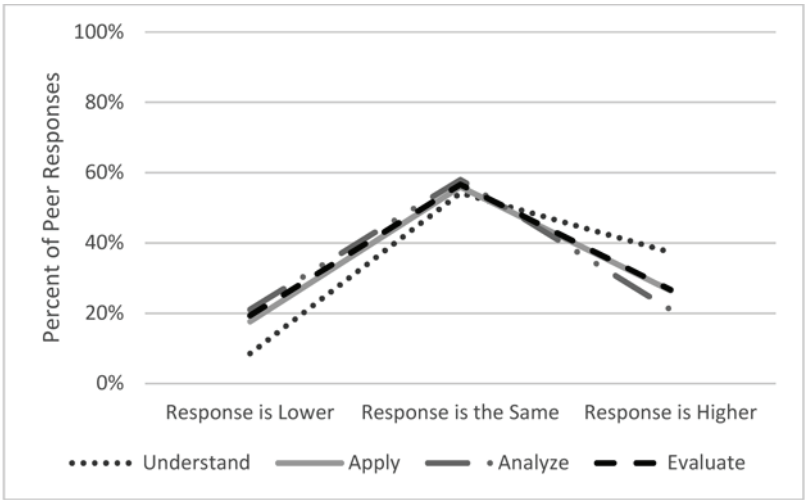

FIGURE 3
Peer Response Level by Bloom's Level of Prompt

intersubjectivity? The characteristics examined were who created the prompt that started the discussion thread, and the Bloom's taxonomy level of the prompt. A chi square test of goodness-of-fit was performed to determine whether different types of prompts made a difference in the level of the peer responses. No significant difference was found between the types of prompts χ^2 (4, N = 461) = 1.984, p = .739. A chi square test of goodness-of-fit revealed significant differences in level of peer responses across the four levels of Bloom's taxonomy level of the prompt χ^2 (6, N = 461) = 14.316, p = .026. Figure 3 shows that the Bloom's level of Understand generated proportionately more responses with IAM levels

TABLE 3
Cross Tabulation of the Prompt Characteristics and Peer Response Level

Groups	*Response is Lower*	*Response Is the Same*	*Response Is Higher*
Type of Prompt			
Initial teacher prompt	32 15.1%	120 56.6%	60 28.3%
Subsequent teacher prompt	31 19.9%	86 55.1%	39 25.0%
Learner generated prompt	14 15.1%	55 59.1%	24 25.9%
Bloom's Level of Prompt			
Understand	10 8.5%	64 54.2%	44 37.3%
Apply	16 17.6%	51 56.0%	24 26.4%
Analyze	30 21.0%	83 58.0%	30 21.0%
Evaluate	21 19.3%	63 56.6%	25 26.7%

that were higher than the previous post than the other three levels in Bloom's taxonomy. None of the prompts were at the Remember or Create level. Consequently, the prompts exhibiting the level of understanding also generated proportionately fewer posts in which the responses were lower in IAM level. The relative frequencies of lower, same, and higher response levels were more or less similar between the prompts promoting application, analysis, and evaluation.

Characteristics of the Previous Posts

In Tables 4 and 5, the third research question is addressed: What is the relationship between the characteristics of the previous posts and intersubjectivity? The characteristics examined included the IAM level of the previous post and the number of words in the previous post. A chi square test of goodness-of-fit was performed to determine whether the IAM level of the previous post was correlated to the IAM level of the peer responses. A significant difference was found between the IAM levels of the previous posts χ^2 (6, N = 461) = 270.011, $p > .000$. The significant differences between Phase 1, 2 and 3 showing percentage of posts generating lower, same, and higher responses is shown in Figure 4. A post hoc comparison using Games-Howell revealed that the significant differences were between Phase 1 and 2 and Phase 1 and 3. Phase 1 (Sharing and Comparing) generated significantly higher posts on the IAM scale than Phase 2 (Dissonance) (mean difference = .771, $p > .000$); and Phase 1 generated significantly higher posts on the IAM scale than Phase 3 (Negotiation and Coconstruction) (mean difference = 1.011, $p > .000$). The IAM scale mean of peer responses to each phase is shown in the last column in Table 4.

In the next analysis of the characteristics of the previous posts shown in Table 5, an ANOVA analysis was conducted to examine the relationships between number of words in the previous post and the grouping of the level of the peer response (lower, same or higher). The ANOVA results indicated a significant difference in the number of words in the previ-

TABLE 4
Sequence of IAM Peer Responses: IAM Level of Previous Post and Peer Response Level

Groups	*Response Is Lower*	*Response Is the Same*	*Response Is Higher*	*Responses Mean IAM Scale*
IAM Level of Previous Post				
Phase 1: Sharing and Comparing	0 0.0%	230 67.8%	109 32.2%	2.32
Phase 2: Dissonance	50 56.2%	29 32.6%	10 11.2%	1.55
Phase 3: Negotiation and Coconstruction	24 82.8%	1 3.4%	4 13.8%	1.31
Phase 4: Testing Tentative Constructions	0 0.0%	0 0.0%	0 0.0%	0
Phase 5: Statement and Application of Newly Constructed Knowledge	3 75.0%	1 25.0%	0 0.0%	1.25

TABLE 5
Characteristics of Previous Posts: ANOVA Analysis of Number of Words

	Response Is Lower Mean (SD)	*Response Is the Same Mean (SD)*	*Response Is Higher Mean (SD)*	*F Statistic*	*p Value*
Number of words in previous post	312.10 (185.69)	263.53 (194.48)	217.85 (204.421)	5.62	.004

ous post on the level of responses. A post hoc comparison using Games-Howell, chosen for unequal variances, showed the significant difference was between peer responses at a lower level and peer responses at a higher level. Previous posts generating a higher IAM phase in the subsequent post had a mean difference of 94.25 fewer words ($p < .004$).

In Table 6, a follow up analysis was conducted to examine the peer responses with a unique feature. Of the 591 peer responses, 24 were addressed to multiple people in the course. These peer responses were binary coded as 1 for responses to multiple people and 0 for a response to one person. A point-biserial correlation analysis found a small significant correlation showing that where multiple people are quoted or addressed in the peer response, the peer response was more likely to be higher, thus exhibiting emerging intersubjectivity.

DISCUSSION

This study examined how the course structure, characteristics of the prompt, and characteristics of the previous posts are related to the emergence intersubjectivity within the discussion forum. Each of these characteristics provided clues as to important factors in the emergence of intersubjectivity in discussion forums.

The course studied in this research had a unique structure. The 15 weeks of the course were divided into five segments of 3 weeks each. Three of the segments consisted of dialogue discussion forums, one segment was organized into a role play activity, and the final segment focused on reflection. The dialogue

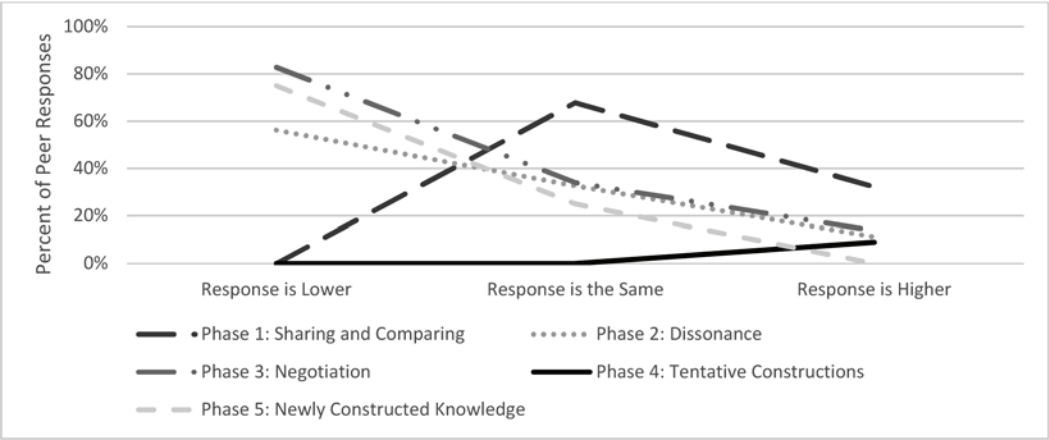

FIGURE 4
Peer Response Level by IAM Phase of Previous Post

TABLE 6
Relationship between IAM Phase and Peer Responses

	Peer Responses to Multiple People	*Sig*	*N*
IAM level of peer response (lower/same/higher)	.091*	.028	591

Note: *$p < .05$. **$p < .01$.

segment of the course generated a wider variety of peer responses at a higher, lower, or the same IAM phase as the previous post, suggesting a stronger emergence of intersubjectivity. The role play segment of the course more often generated a higher response, as learners moved quickly to Phase 2 (Dissonance) while staying in their roles. The instructor did not require learners in the dialogue forums to explicitly disagree with each other. However, in the role play, each participant was role playing the character of a philosopher and responding to classmates as that philosopher. In the role play, learners quickly moved from Phase 1 (Sharing and Comparing) to Phase 2 (Dissonance). However, because they were required to stay in character, they did not move higher on the IAM scale. They stayed in the dissonance stage as they discussed various questions while in character. Gunawardena et al. (1997), who development the IAM, also noted that a debate format is not expected to proceed beyond Phase 2 if the learners are required to stay in their roles. Of course, Level 3 and beyond can occur if learners are allowed to move beyond a strict adherence to their roles, or if learners decide to move beyond their roles anyway. While previous research (Jeong, 2006, 2007; Tannen, 1999, 2012) has found that it may be difficult for learners to disagree or share dissonance, the role play was successful in creating dissonance as disagreeing was expected. Perhaps creating a follow-up activity to allow learners to synthesize knowledge would encourage the depth of learning achieved in the role play to emerge into intersubjectivity as learners negotiate the construction of new knowledge.

Another aspect of the course structure was the length of the segments. Each segment ran for 3 weeks, with a discussion forum for 2 weeks followed by a silent reflective week. In

the 2-week discussion forums, the posts in the second week were more likely to be higher or lower on the IAM phase than the previous post. Previous research (Hall, 2011; Jeong, 2004) also suggested that additional time is needed for intersubjectivity to emerge; intersubjectivity is more likely to emerge later in the course. One week forums may be too short to allow for intersubjectivity and the negotiated construction of new knowledge.

In analyzing the characteristics of the prompt, the results suggest that prompts at the Understand level of Bloom's taxonomy generated higher levels of intersubjectivity. This result does not align with previous research (Hall, 2011; Howell et al., 2014) which suggest prompts with higher levels are more likely to generate critical thinking and intersubjectivity. Possibly within the unique design of this course, initial prompts at lower levels of Bloom's taxonomy allowed more room for learners to push the discussion thread higher on the IAM scale.

The characteristics of the previous posts provided additional insights into the intersubjectivity of the discussion forum in the course studied. Peer responses at IAM Phase 1 (Sharing and Comparing) generated additional peer responses with significantly higher IAM phases. This result makes sense when considering that learners move up and down on the IAM scale; the negotiation of knowledge creation is cyclical and iterative (Gunawardena et al., 1997; Jeong, 2003). Peer responses at higher levels could easily move up or down, not just higher as is only possible at Phase 1.

Another characteristic of previous posts studied was the number of words. Previous posts with fewer words generated peer responses with significantly higher IAM phases. This result may suggest that shorter posts, such as questions or clarifications or similar short remarks, may provide more room for the next participant to build upon what has been said. Most research in online discussions has moved beyond quantitative analysis on the number of words in posts (Jeong, 2014; Rourke & Anderson, 2004; Rourke et al., 2001), however some recent research has focused on words (Howell et al., 2014; Lim & Hall, 2015) to measure the length of peer responses and its relationship with generating intersubjectivity or higher level thinking. Many instructors in online courses still require a certain number of words (Curry & Cook, 2014), and understanding how that requirement or lack of it may interact with the quality of the discussion is important to course design.

Finally, peer responses addressing the discussion posts of multiple people were significantly higher on the IAM phase than posts responding to just one person. A key component of intersubjectivity is the idea of synthesizing multiple perspectives (Dennen & Wieland, 2007; Elizabeth, Anderson, Snow, & Selman, 2012; Hall, 2015). The results from this study suggest encouraging learners to respond to multiple classmates may assist the learners in generating the emergence of intersubjectivity.

CONCLUSION

This study found the dialogue format generated significant intersubjectivity and role play was effective in creating dissonance. Intersubjectivity was more likely to emerge in the second week of the discussion forum. Discussion prompts beginning with the Understanding level of Bloom's taxonomy, previous posts with fewer words, and peer responses addressing multiple classmates each generated higher levels of intersubjectivity. The results suggest several recommendations for online instructors. Regarding the structure and design of the course, online course designers should consider generating different types of activities besides discussion or dialogue. Instructors could design assignments where learners begin with role play and debate formats to explore the dissonance between ideas using a structured format. In a follow-up activity, learners could then work on coconstruction of knowledge and negotiating meaning building upon the deeper understanding of concepts gener-

ated in dissonance. A well designed dialogue, though, can also generate intersubjectivity, if learners are encouraged to quote others, extend the conversation, listen, and develop a common understanding, as designed in the rubric for the course in this research study (see Appendix A). Online instructors wishing to encourage the emergence of intersubjectivity and the coconstruction of knowledge should design discussion forums lasting at least 2 weeks. Including a silent reflection week may refresh learners' ability to generate meaningful discussion posts building on each other's work. This course did not, as is typical in many online courses, require a certain number of posts or replies to classmates or even a certain number of words per post. Instead, learners were graded on their contributions to extending the conversation. Online instructors who shift the focus from number of posts to the quality of the discussion experience may assist learners in focusing on the progression from individual contributions to interdependent contributions necessary for intersubjectivity to emerge. Avoiding a word count requirement allows for posts where learners ask questions and probe further in shorter posts—posts that prompt the conversation to grow and expand. Instead of requiring a certain number of replies, instructors could encourage learners to quote multiple classmates in their replies, setting up a structure facilitating the emergence of intersubjectivity. Finally, a stronger focus on the dialogue, as opposed to focusing on the Bloom's level of the prompt, may encourage learners to push a discussion higher on the Bloom's level as they work from understanding to synthesis of different aspects of a concept.

This study deliberately narrowed the research to the peer responses. Learners' initial posts and instructor's initial posts and subsequent posts were not a focus of this study. Further research, similar to Belcher et al. (2015), could explore the role of the instructor in the discussion forum and instructor feedback to individual learners in supporting the emergence of quality dialogue and intersubjectivity. Additional research could identify whether some learners are more likely to create interdependent contributions, and why some learners only write individual contributions. A deeper understanding of the relationship between intersubjectivity, critical thinking, and quality in online discussions would assist instructors in supporting rigor and engagement within online courses.

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APPENDIX A: DISCUSSION RUBRIC

Mental Model	*Posting (1 pt)*	*Questioning (5 pts)*	*Reflecting/ connecting (10 pts)*	*Dialoguing (15 pts)*
Definition	You post your message as if you were submitting an assignment—often repeating what has already been said—you don't respond to others nor engender a response.	You ask questions but often they aren't connected with what others have said—they may not even be connected to what you've read—you don't engender a response.	You respond to what others have said—using their name or quoting them—sharing your personal experience(s) and metaphor(s) to further explain your viewpoint and develop a common understanding. You engender a response.	You are present in the discussion board—listening, asking for clarification, sharing experiences, affirming others, and extending the conversation.

Source: Based on Freed (2003).