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### Ways of Knowing in a Blended Learning Cohort

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# Ways of Knowing in a Blended Learning Cohort

## Abstract

The following is a report on the content analysis of threaded discussion boards from three blended learning cohorts. The purpose of the content analysis was to determine whether an individual's way of knowing (WoK), or epistemology, could be perceived through a content analysis of historical data in the form of online threaded discussion boards. The research question in this content analysis was "What ways of knowing emerge from online discussion threads within a yearlong university cohort?"

The researcher used a priori coding scheme based on the literature surrounding WoK to explore the online threaded discussions of three blended learning cohorts. Coding data was then analyzed for individual cohort member results as well as trends within and between cohorts. With minimal exceptions, the cohorts remained intact with the same facilitators during the yearlong, four-quarter program. The continuity in participants yielded results across four consecutive quarters of the university program, with one cohort starting at a different time. Discussion and recommendations for further research are presented at the end of this report.

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Content Analysis of Ways of Knowing in a Blended Learning Cohort

Morgridge College of Education

University of Denver

By Dawn McWilliams

June 2014

### **Abstract**

The following is a report on the content analysis of threaded discussion boards from three blended learning cohorts. The purpose of the content analysis was to determine whether an individual's way of knowing (WoK), or epistemology, could be perceived through a content analysis of historical data in the form of online threaded discussion boards. The research question in this content analysis was "What ways of knowing emerge from online discussion threads within a yearlong university cohort?"

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### **Introduction**

“A defining condition of being human is our urgent need to understand and order the meaning of our experience, to integrate it with what we know to avoid the threat of chaos” (Mezirow, 2000, p. 3). From this idea, Mezirow theorizes that transformative learning is a “process by which we transform our taken-for-granted frames of reference (meaning perspectives, habits of mind, mind-sets) to make them more inclusive, discriminating, open, emotionally capable of change, and reflective” (Mezirow, 2000, p. 7-8). By transforming those frames of reference, individuals are able to create opinions that will justify appropriate action.

Transformational learning is different from informational learning. Informational learning increases knowledge, and “it is thought to bring about changes in adults’ attitudes, skills, and even their competencies” (Drago-Severson, 2012, p. 7). Adults need informational learning in daily life. However, adults today are faced with more adaptive challenges, which require more than informational learning than technical challenges (Kegan, 2000).

“These adaptive challenges are murky, systemic problems with no easy answers” (Heifetz & Laurie, 2001, p. 36). Adaptive challenges are those challenges where experts cannot solve the problem with a current knowledge base. Preparing individuals to meet adaptive challenges requires disorientation, which involves the development of new relationships, exposing conflict or letting conflict emerge, and letting individuals experience pressure that encourages growth without overwhelming individuals (Heifetz and Laurie, 2001).

Most problems faced by adults in today's society involve a combination of technical and adaptive challenges (Heifetz & Linsky, 2004). "Navigating these murky and obscure adaptive challenges requires not only new approaches but also often greater internal developmental capacities" (Drago-Severson, 2012, p. 8-9), suggesting a need for transformational learning to address these challenges.

Adult learners today lead busy lives, and finding opportunities to participate in transformative learning experiences that support adults in addressing adaptive challenges may be difficult. With the advent of technology, many adults seek online learning opportunities, as evidenced by the current trend of Massive Open Online Courses (MOOCs) utilized at universities such as Harvard, Yale, Stanford, and Duke, among many others. While MOOCs and other online-only opportunities offered by universities, nonprofits and companies provide easy access to course content via the Internet, allowing individuals to access the content without being physically present, questions remain as to whether participants are involved in transformational learning that will support individuals and teams in solving adaptive challenges.

Flipped classrooms, another type of online learning, uses annotated videos that students can access via the Internet from home or other non-school environments for informational learning followed by interaction with peers and teachers the following day in a face-to-face setting (Tucker, 2012), and some online courses utilize lectures to share information (Cooner, 2010; Dabrowski, 2006) across the Internet. Informational learning is accessed more than one billion times a day through Google (<http://www.google.com/competition/howgooglesearchworks.html>); therefore, a case can be made that informational learning is readily available via an online learning format or

even a blended learning format with a flipped classroom approach where application of learning concepts happens in face-to-face meetings.

What about building transformative knowers through a blended learning program? The meta-analysis of Means, Toyama, Murphy, Bakia, and Jones (2010) supports the idea that an online class promotes “self-reflection, self-regulation and self-monitoring leads to more positive online learning outcomes” (p. 45). Cohort learning has shown mixed results in supporting learners in blended learning environments (Beachboard, 2011). According to an examination of the research, blended learning appears to be as successful or more successful in developing the academic knowledge (Allen, Mabry, Mattrey, Bourhis, Titsworth, & Burrell, 2004; Banks, 2004; Bernard, Abrami, Lou, Borokhovski, Wade, Wozney, Wallet, Fiset, & Huang, 2004; Bernard, Abrami, Borokhovski, Wade, Tamim, Surkes, & Bethel, 2009; Brais, M., 2012; Lim & Morris, 2009; Pereira, Pleguezuelos, Meri, Molina-Tomás, & Masdeu, 2007; Sitzmann, Kraiger, Steward, & Wisher, 2006) and reflection (Jung, Choi, Lim, & Leem, 2002; Mousavi, Heidary, & Pour, 2011) of learners as compared to traditional face-to-face learning or online-only learning.

This leads to the question as to whether it is feasible to support transformational learning of participants in a blended learning environment. It is therefore essential to know if it is possible to find evidence of transformational learning in a blended learning environment.

### **Ways of Knowing (WoK)**

Transformational learning is less about what we know and more about how we know. Adults process information and experiences differently based on their current

WoK. “When transformational learning or growth occurs, there is a qualitative change in the structure of a person’s meaning-making system, or way of knowing” (Drago-Severson, 2012, p. 7).

Kegan (2000) concludes that a frame of reference in transformational learning is the same concept as a WoK or order of consciousness in the constructive-developmental model. Individuals develop through different WoK as they interact with others in transformative learning experiences. Mezirow (2000) suggests that individuals transform through epochal moments when an insight is sudden and dramatic or through incremental learning where exposure to a variety of points of view can result in transformation.

Kegan (1982) designates these meaning systems, ways of knowing (WoK), or transformative states, as orders of consciousness. Orders of consciousness refer to WoK that can be fluid between adjacent orders (Drago-Severson, 2009). An individual may move between orders of consciousness based on context (Erikson, 2006), being in one order of consciousness at work and a different order of consciousness in relationships with friends. Additionally, the orders of consciousness are hierarchical as WoK deepen.

Drago-Severson (2012) utilizes Kegan’s order of consciousness, capitalizing on the final four orders of consciousness and renaming these as WoK. Drago-Severson (2009) renames the adult WoK as instrumental, socializing, self-authoring, and self-transforming. An instrumental WoK means that an individual is determining what he or she knows from an authority figure. Defining what is known based on a more popular other would indicate an individual was in the socializing WoK. A self-authoring WoK suggests that the individual has started forming his own opinions and ideology. Finally,

in the self-transforming WoK, an individual forms what he knows by gathering opinions and thoughts from a variety of other individuals.

### **Purpose of the Study**

Drago-Severson's framework is based on Kegan's psychology work around a constructive-developmental model (1982) that provides form for Mezirow's transformational learning (2000). Using Drago-Severson's framework will provide worthwhile information in exploring whether one can assess an individual's WoK through historical online threaded discussions through content analysis.

### **Significance of the Study**

While research has been done to examine WoK in adult learners through interviews (Baxter-Magolda, 1992, 1998, 2000, 2003, 2008; Drago-Severson, 2009; Kegan, 1980) and surveys (Pizzolato, 2003, 2004, 2005, 2007) in traditional university learning programs, a review of the research shows little that assesses the presence of WoK and changes over time in blended online learning communities. This research could add another layer to determining WoK beyond interviews and surveys, as well as potentially provide critical input into whether a blended learning environment is conducive to supporting individuals in transformative learning. Transformative learning could be measured by a change in WoK over time.

### **Research Question**

What WoK emerge from online discussion threads within a yearlong university cohort?

## Literature Review

### Social Constructivism

What is knowledge? In the late 18<sup>th</sup> and early 19<sup>th</sup> centuries, Emmanuel Kant took two separate theories of knowledge and attempted to combine them into one theory. The first theory was the view that people could logically analyze actions and objects to develop knowledge. The second theory was that people could generate new knowledge through their own experiences. Kant, then, was among the first to develop a theory of constructing knowledge (Brooks & Brooks, 1993).

Through his observations of children in a variety of environments, Piaget concluded that children constructed their knowledge through their experiences with objects. Piaget combined a constructive theme of philosophy with a biological theme of development to define specific stages that a child passes through during early development (Oxford, 1997; Soldz, 1988). According to Noddings (2012), “many educators sympathetic to constructivism have criticized Piaget’s work for concentrating too heavily on the individual child’s interactions with objects. These educators point out that most of us learn more from one another than from the direct manipulation of objects” (p. 128).

Vygotsky simultaneously developed a similar theory to Piaget’s theory of cognitive constructivism (Oxford, 1997). Vygotsky theorized, however, that knowledge is not only constructed through interactions with objects, but also through interactions with others (Oxford, 1997; Soldz, 1988). Vygotsky contended that thought develops after speech, thereby thought must develop “from society to the individual and not the other way” (Kanselaar, 2002, p. 2).

According to Kanselaar (2002), constructivism is a concept with three aspects. The first is a set of epistemological beliefs, followed by a set of psychological beliefs that learning involves constructing knowledge for oneself, and finally a set of pedagogical beliefs about how to best support learners. Transformational learning and constructive developmentalism combine epistemological beliefs with psychological beliefs.

When a learner is confronted with new information, the learner must either “actively construct a different understanding” (Brooks & Brooks, 1993, p. 5) to accommodate new experiences or ignore the new information and retain the original understanding.

Deep understanding, not imitative behavior, is the goal. But, capturing another person’s understandings is, if anything, a paradoxical enterprise. Unlike the repetition of prescribed behaviors, the act of transforming ideas into broader, more comprehensive images escapes concise description. We see neither the transformed concept nor the process of construction that preceded its transformation. The only discernible aspect is, once again, the student’s behavior, but a different type of behavior. In the constructivist approach, we look not for what students can repeat, but for what they can generate, demonstrate, and exhibit. (Brooks & Brooks, 1993, p. 16)

In other words, another person’s WoK can only be established through his actions, and these actions cannot be a repetition of someone else’s ideas, but rather the generation or exhibition of a new idea. In the case of this research,

another person's WoK may potentially be established through the dialogue of individuals in a group setting.

“Constructivist theory emphasizes that learning should be authentic, and that learning needs to meet real life experiences” (Huang, 2002, p. 33).

Furthermore, constructivism is learner-centered. Huang (2002) makes a case for online discussion groups as a method for constructing new understandings because online discussions groups are typically authentic, collaborative, inquiry-based, and project-based. Mezirow (2000) suggests that learners need to be “able to participate freely and fully in rational discourse to find common meaning and validate beliefs, and effective in acting on the result of this reflective learning process” (p. 29). This quote identifies Mezirow as a social constructivist.

### **Constructive-Developmental Theory**

Kegan (1982), a self-described neo-Piagetian, considers the object-subject relationship to be essential to meaning-making. Expanding on Kohlberg's theories and studies of the development of moral reasoning in combination with Piaget's stages, Kegan (1982) theorizes that meaning-making adapts and matures throughout the lifetime of an individual. “Although everyone makes meaning in richly idiosyncratic and unique ways, there are striking regularities to the underlying structure of meaning-making systems and to the sequence of meaning systems that people grow through” (Kegan, 1980, p. 374). Central to Kegan's theory is the idea “subject-object relations emerge out of a lifelong process of development: a succession of qualitative differentiations of the self from the



world” (Kegan, 1982, p. 77). Individuals are subject and have object. By moving through the orders of consciousness, what was subject becomes object.

Kegan uses the terminology of orders rather than stages to suggest that the orders are not a strict sequence with a clear beginning and end, but instead that the meaning-making of one order transcends the meaning-making of the previous order (Love & Guthrie, 1999). In Kegan’s orders of consciousness, meaning-making evolves as the individual shifts from one order of consciousness to the next. This shift involves an adjustment in that what was subjective becomes objective in the next order. “As meaning-making evolves, thinking becomes less rigid, exclusive, simple, and dogmatic and more flexible, open, complex, and tolerant of differences” (Eriksen, 2006, p. 291). Unlike Piaget’s stages of cognitive constructivism, Kegan’s orders of consciousness do not refer to specific ages (Drago-Severson, 2009). Rather, an individual continues to develop throughout his or her life if one engages in constructivist activities (Kegan, 2000).

Additionally, each order of consciousness represents a struggle of evolutionary truces between independence and inclusion (Figure 1). As individuals move between orders, the individual also moves between a desire to be more independent versus more inclusionary (Kegan, 1980).

During the loops of Figure 1, the individual is simultaneously in two orders of consciousness as he or she struggles to make what was subject object. According to

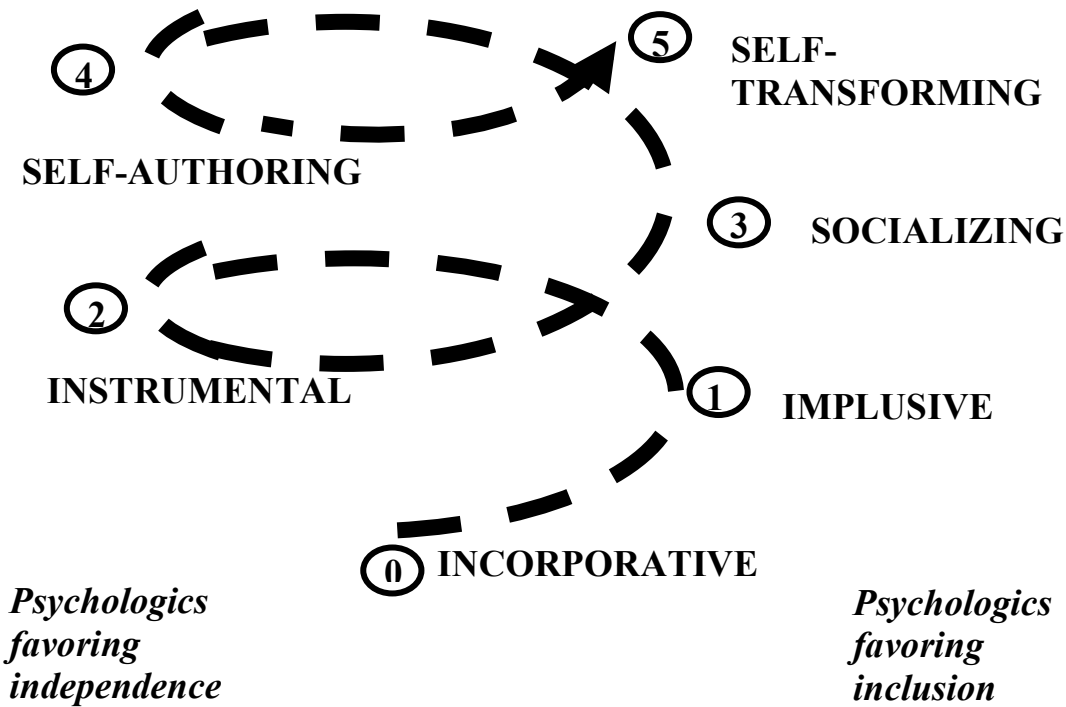


Figure 1. Keegan's Orders of Consciousness (1982, p. 109)

Drago-Severson's (2009) research, individuals only move between adjacent WoK while progressing through the orders. No individuals assessed in 1994 had achieved the self-transforming order, and many individuals were between two orders (Drago-Severson, 2009).

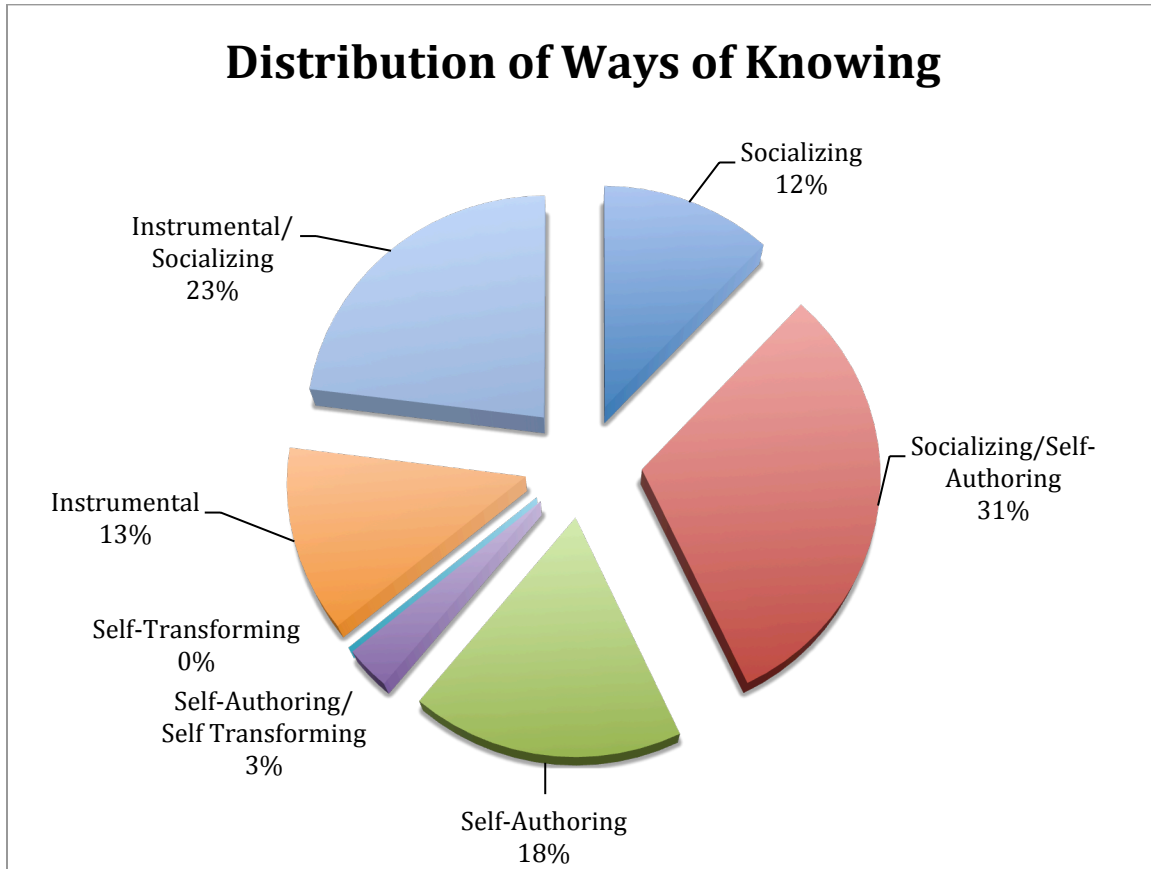


Figure 2. Distribution of WoK (Drago-Severson, 2009, p. 42).

**Incorporative/Impulsive.** The incorporative and impulsive orders occur during early childhood, while the final four stages are obtained as individuals mature into adolescence and beyond.

**Instrumental.** Drago-Severson (2012) renames the four stages of Kegan's orders of consciousness, borrowing the concept of the orders for adult learning theory. The imperial order from Kegan becomes the instrumental WoK in Drago-Severson's theory. Individuals in this order "make meaning by learning to construct 'durable categories' – lasting classifications in which physical objects, people, and desires come to have properties of their own that characterize them as distinct from 'me'" (Love & Guthrie, 1999, p. 69). These individuals are not yet able to think abstractly and are defined by

self-interest. Drago-Severson defines persons who are in the imperial WoK as those who are rule-oriented. These are learners who are subject to their own needs, interests, wishes, and desires while having object over their impulses and perceptions. “Experiences are organized by the following concrete qualities: attributes, events, and sequences; noticeable actions and behaviors; and one’s own point of view, needs, interests, and preferences (Drago-Severson, 2009, p. 43). These individuals are concerned with right and wrong ways of acting. Adults in the instrumental WoK cannot take the perspective of another fully, and regard others as either barriers or collaborators.

**Socializing.** In transitioning to the socializing WoK, individuals begin to be able to coordinate points of view, which lead to the ability to “talk about feelings experienced now as feelings rather than social negotiations” (Kegan, 1982, p. 95). The interpersonal self has the ability to be conversational and recognize others as a way of completing the self. These individuals, according to Drago-Severson (2012), are not able to hold their relationships as object. Learners in the socializing WoK have “...a very difficult time disagreeing with those they value and with managing conflict” (Drago-Severson, 2012, p. 36). These learners hold others liable for their feelings and, in turn, hold themselves responsible for the moods of others. Socializing knowers are unable to examine the expectations they have for themselves. “Interpersonal conflict is experienced as a threat to the self; thus socializing knowers avoid conflict because it is a risk to the relationship and is experienced as a threat to the coherence of a person’s very self” (Drago-Severson, 2009, p. 45).

**Self-Authoring.** As relationships move from being subject to object, individuals in this order have the ability to regulate the emotions of the previous WoK (Kegan, 1982).

Adults with the self-authoring WoK are reflective learners who can “identify with abstract values, principles, and long-term purposes” (Drago-Severson, 2012, p. 43).

These learners are capable of simultaneously holding opposing emotions, but the self-authoring learner is limited by the inability to accept feedback objectively because their choices are deeply connected to their values and ideals. Drago-Severson (2009) refers to these learners as having a “reflective self” (p. 47) because they are now able to hold their relationships as object. Self-authoring learners create their own self-systems based on values. These learners consider accomplishment, proficiency, and accountability to be their main concerns.

**Self-Transforming.** In this final WoK, learners are capable of holding their ideals and values as object. Individuals are capable of seeking out information that is oppositional to previously closely held values and ideals (Kegan, 1982). Individuals with a self-transforming WoK thrive on working to “understand how seemingly opposing perspectives overlap” (Drago-Severson, 2012, p. 44). These learners are open to learning from relationships in a different way than those learners in the socializing WoK. The self-transforming knower is capable of expressing the self and allowing others to express themselves without judgment. “A self-transforming knower has the capacity to be less invested in identity, point of view, and standards and is more open to others’ perspectives” (Drago-Severson, 2009, p. 49).

### **Blended Learning**

**Definition.** “Blended learning is a formal education program in which a student learns at least in part through online delivery of content and instruction with some element of student control over time, place, path, and/or pace and at least in part at a

supervised brick-and-mortar location away from home” (Staker & Horn, 2012, p. 5). According to Means, Toyama, Murphy, and Baki (2013), blended learning typically meets the needs of adult learners for at least one of these three reasons: (a) individuals are unable or unwilling to attend traditional classes in a face-to-face setting; (b) blended learning can be delivered more cost-efficiently; and/or (c) instructors can be made available to individuals who live too far away for frequent face-to-face classes.

**Effectiveness.** With the increase in both online and blended learning models in recent history, multiple researchers have examined the effectiveness of a blended learning model on student learning. Means, et al. (2013) conducted one of the most recent meta-analysis of blended and online learning models for effectiveness. Findings from this meta-analysis point to blended learning being more effective than face-to-face learning alone and significantly more effective than online learning. “The overall finding of the meta-analysis is that online learning (the combination of studies of purely online and of blended learning) on average produces stronger student learning outcomes than learning solely through face-to-face instruction” (Means, et al., 2013, p. 29). Additionally, the meta-analysis examined whether blended or online learning was more effective for a particular type of learner (K-12, undergraduate, postgraduate and job-related training), and found no statistically significant difference in the effectiveness of online learning between groups.

The findings of the researchers are consistent with those of other meta-analyses on blended learning and online learning effectiveness (Allen, Bourhis, Burrell, & Mabry, 2004; Bernard, et al., 2004; Bernard, et al., 2009; Sitzman, et al., 2006; Williams, 2006). “The meta-analysis findings do not support simply putting an existing course online, but

they do support redesigning instruction to incorporate additional learning opportunities online while retaining elements of face-to-face instruction” (Means, et al., 2013, p. 36).

Allen, et al. (2002) assessed student perceptions in a meta-analysis, finding that online models did not decrease the levels of student satisfaction with learning. Some smaller studies, including Beard and Harper (2002), found that students preferred the in-person class model for interacting with classmates and the online portion for flexibility.

Those students who spent more time in online discussions had higher assignment grades and scored better on exams in the course than students who did not take the class online (Campbell, Gibson, Hall, Richards, & Callery, 2008; Hwang & Arbaugh, 2009; Pereira, et al., 2007). Students in a blended learning nursing class self-reported higher rates of learning than nursing students in a face-to-face environment only (Hsu & Hsieh, 2011) and indicated a preference for a blended learning model over an online-only model (Schuhmann & Skopek, 2009).

Bernard, et al. (2004) found a negative effect for synchronous learning environments, where individuals are online simultaneously, as compared to traditional face-to-face instruction, and a positive effect size for asynchronous learning environments, where learners participate in online discussions at one’s own pace. Asynchronous environments may also provide for more reflective responses, as an individual can spend more time preparing a response (Means, et al., 2013).

### **Summary**

This literature review describes the theories of social constructivism and the constructive-developmental model as they relate to transformational learning. Using the cohort model in a blended learning program increases the opportunities for social

constructivism, thereby creating the potential to support individuals in growing into new WoK. Finally, literature on blended learning models has shown that the blended learning model is a valid method of delivering instruction that results in deeper reflection of individuals if an asynchronous online environment is utilized.



### Methodology

“Basically, qualitative researchers are interested in understanding the meaning people have constructed, that is, how people make sense of their world and the experiences they have in the world” (Merriam, 2009, p. 13).

Online threaded discussions were downloaded for three cohorts in a university’s blended learning program. One of the cohorts had been split into two online discussion groups. These two discussion groups were treated as separate cohorts in the research because each group had separate discussion threads with independent facilitators.

The names of individuals were removed using a simple alphanumeric system. The initial letter S indicated a student while an initial letter F designated a facilitator. A number was then assigned for each student and facilitator based on the cohort. For example, the fifth student in the second cohort was renamed S205. One facilitator, the program director, participated in all three cohorts; the final number of that facilitator was kept the same throughout the three cohorts (F03, F203, F303).

**Table 1. Coded weeks per quarter.**

Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q2	Q2	Q2	Q2	Q2	Q2	Q2	Q2
W1	W2	W3	W4	W5	W6	W7	W8	W1	W2	W3	W4	W5	W6	W7	W8
Q3	Q3	Q3	Q3	Q3	Q3	Q3	Q3	Q4	Q4	Q4	Q4	Q4	Q4	Q4	Q4
W1	W2	W3	W4	W5	W6	W7	W8	W1	W2	W3	W4	W5	W6	W7	W8

Inter-rater reliability was established.. Two researchers, both well versed in the literature around WoK, established inter-rater reliability. To achieve inter-rater reliability, the two researchers sat side by side, coding the same segments of text simultaneously, discussing similarities and differences. During this process, revisions were made to the coding dictionary and agreements about length of passages were reached. When the researchers consistently matched codes verbally, the second phase of inter-rater reliability

began. In this second phase, the larger categories in the coding dictionary were numbered between 1-10 as shown in Appendix A. Each researcher coded 20 passages, using the number of the category and sent the identified segments, without coding, to the other researcher. Forty total segments were coded in this rating system. The numbers were entered into SPSS®, and a bivariate correlation was calculated. The Pearson's coefficient was 0.863. "The Pearson product-moment correlation coefficient is the most widely used statistic for calculating the degree of consistency between independent raters. Values approaching +1 or -1 indicate that the raters are following a consistent pattern" (Salkind, 2010, p. 627)

Coding was completed for two weeks of each quarter for each cohort. The researcher and program director discussed finding a beginning, midpoint, and endpoint of the yearlong cohort in order to possibly see growth throughout the cohort (R. McClure, personal communication, December 3, 2014). Weeks one and two of the first quarter were coded as the beginning of the cohort. The middle of the cohort was defined as the end of quarter two, weeks seven and eight and the beginning of quarter three, weeks one and two. The endpoint of the cohort was marked by weeks seven and eight of quarter four. Another option could have been to code two weeks at the beginning and end of each cohort with the midpoint being designated as two weeks in the middle of quarter 2 and two weeks in the middle of quarter 3. Through discussions with the program director, it was decided that the latter would not produce a midpoint for the cohorts.

### **Coding**

The coding dictionary (Appendix A) was revised during inter-rater reliability in order to clarify codes and accommodate language found in the threaded discussions.

Items were coded within the WoK and the attribute. For example, a string of sentences might be coded as Socializing – Affiliation (SOC-AF) where socializing is the WoK and Affiliation is the attribute. Descriptors of each attribute were included in the coding dictionary for reference and clear definition. Coding could be between one and three adjacent sentences, but no more than three sentences could be coded together. Adjacent sections could be coded with the same code, but each section included a maximum of three sentences. A new paragraph required new coding.

Further clarification to distinguish codes was discussed with the co-rater during the phase of developing inter-rater reliability. Reasoning in self-authoring was defined as abstract and theoretical while Self-Exploration in self-transforming was outlined as concrete and applicable. Self-exploration in self-transforming meant the participant was asking questions of himself while complexity in self-transforming meant the participant was asking questions of others. If the surrounding evidence/discussion was primarily socializing, then any theory-based reflection was coded as Socializing – Affiliation, with the coders inferring that the reflection was likely a paraphrase. If there was no surrounding evidence or discussion, then the section was coded as Self-Authoring – Reasoning, with the inference that the reflection was independent of another author's thoughts. "I think", "I believe", and "I feel" statements were coded as Self-Authoring - Ideology.

To minimize potential bias, the weeks and cohorts were coded in a random order. For example, a coding order might be Cohort 3, Quarter 2, Week 7 followed by Cohort 1, Quarter 4, Week 8. By coding randomly, the researcher was less likely to code higher

WoK as subsequent weeks were coded. Additionally, random coding prohibited memory of previous coding for individuals, ensuring more reliable coding.

### **Subjects**

Cohort One had 12 consistent participants and two facilitators. Two additional participants in Cohort One were excluded from the final analysis because they did not participate in all four quarters of the program. The data for these two participants was coded, however. Cohort Two had eight consistent participants and two facilitators. One additional participant was excluded because he/she did not participate in all four quarters. Cohort Three had 10 consistent participants with two facilitators. As previously mentioned, one facilitator was common to all three cohorts. Facilitator comments on the threaded discussions were coded in addition to student comments.

### **Coding Samples**

While some phrases, sentences, and clusters of sentences had minimal coding options based on the language and tone of the writing, many segments presented a challenge. In Table 2, ideal responses for each attribute in each WoK are presented. The majority of the language in the threaded online discussions was ambiguous and could have been coded for more than one WoK. If the two possible codes were within the same WoK, the coding options were minimal and choices were made. For example: “I have been thinking over and over about our discussions with facilitating meetings, but your post this week made me really reflect on the routines we have (or don't have) during this time. Although I think creating a purpose for our work is the first step to making our time together more ‘effective and efficient’, creating routines and structures is something we also need to work on,” S306 wrote. This segment could fit into Self-Authoring: Action

(SA-AC) because S306 was prompted to reflect on his or her routines by another student or facilitator. The segment also could have been coded as Self-Authoring: Ideology (SA-IE) because S306 presents a personal opinion. Ultimately, the segment was coded as Self-Authoring: Identity (SA-ID) because the context demonstrated to the researcher that S306 was considering whether he or she was competent, which is one of the indicators for Identity. All of the options for coding this segment of text, however, fell in the self-authoring WoK.

**Table 2. Coding samples**

Way of Knowing (WoK)	Attribute	Quote
Socializing	External Authority	“I appreciate the in-depth discussion in ‘Moving Forward: Thinking Strategically About Building Learning Organizations’, and the concrete examples used to illustrate each component. The ‘Wheel of Learning’, ‘Reinventing Relationships’ and ‘Finding a Partner’ sections were also impactful in their simplicity and applicability to real-life situations.” – S04
	Affiliation	“I really liked your take on this. I totally see where you are coming from ... they are most certainly connected! Thanks for the Aha Moment! Good luck with your teacher this quarter. You can tell that you really want the most for your students and I'm sure this will be infectious for this teacher. See you on Saturday!” -S207
	Judgment of Others	“Many of the students do not truly desire an alternative learning environment. They don't want to be in school at all. There is even one student at the school who is "taking up a seat" to "review content" for the GED she "plans to take" in a year. I have this student in class; she is frequently absent, often comes late to class, does no work, and stays on her phone all class when she is there.” – S12

Self-Authoring	Ideology	“A part of me firmly believes that a "leader" must have a vision for the group/organization - that is, I believe some people are truly visionaries. But I don't believe all people are visionaries.” – S304
	Identity	“We have had many workshops and institutes around diversity and equity within our district, but I am still working on how to bring what I understand and know to a building level to really impact student achievement.” S06
	Reasoning	“Each day I feel more inspired and more resigned at the same time.” – S304
	Action	“On a small scale, through reflective conversations with teachers I have encouraged teachers to challenge the status quo and collaboratively discuss and develop potential steps toward change.” – S201
Self-Transforming	Self-Exploration	“When I think of myself as a future leader and the examples above, I want to, and frankly need to, invest significant time into looking deeply into my own assumptions about diversity. I want to be the leader that challenges the conditions and systems that support inequities.” – S09
	All perspectives	“I did have a question about the different leadership roles you listed. Do each of your campuses have one of each of these leaders? Since you have experience implementing professional development systems, as a first year principal, which PD method would you use? Which PD method that you are working with do you deem as the most difficult to implement?” - S310
	Complexity	“I understand the uphill battle with the district initiatives making it difficult for your teachers. My thought continues to come back to what has been expressed to me. So many teachers say they have been using backwards planning for years. If that is the case, how can we use that to encourage them to move forward? It has

		<p>been around a long time. Despite the changes in the standards, how can they utilize what they know? The format has changed, but have the foundations of what good planning, assessing and instruction changed that much? Some would argue yes, but if you hear the same thing that I do, how could you build off of that to make it about kids and not the district?” – S208</p>
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If, however, the possible codes were between two WoK, the researcher took more care to ensure that the coding applied was the best fit.

“Teachers are also required to post and review the unpacked standards they will be addressing in that day’s lesson. When the administration conducts walk through observations of classrooms, one of the first things they look for is the unpacked standards for the day posted in the classroom. If a teacher does not have the standards posted, they are expected to correct the issue immediately,” S205.

In the segment written by S205 above, the researcher had to infer whether the author was speaking ideologically about the administration’s expectations and steps; whether the author was judging others; whether the author was connecting previous experience to the readings; or some other coding scheme. While this segment could be coded in several ways within self-authoring, the researcher chose to code the segment as Socializing – External Authority. One of the indicators for External Authority is that the writer is generalizing from one context to another. Many phrases and segments required this level of analysis and decision-making by the researcher, adding to the subjectivity of the research.

To analyze WoK, co-occurrence tables that cross-referenced the individual with the WoK and attribute were used to determine the frequency of each WoK for each individual. These tables were transferred to an Excel spreadsheet where individual data was converted to percentages for each participant. Because contributors wrote varying amounts of text on the board and therefore had differing amounts of coding, percentages made the most sense for comparison as opposed to raw data.

### **Summary**

The researcher coded eight weeks of data for each of three cohorts with two weeks per quarter being coded. Pre-determined codes were utilized for the analysis based on the research on WoK. Inter-rater reliability and cross coding were used to increase reliability.

Ambiguity existed at times in the content analysis, requiring decisions in the coding. These decisions were made based on surrounding evidence and overall context of the text. Coding numbers from Atlas.ti were then transferred into an Excel worksheet in order to convert raw data into percentages for individuals for ease of comparison. The following section presents the analysis of the coding.



### Data Analysis

Each full section of text was coded for the individual (S309, S202, F03, etc.) as well as for the WoK and attribute. None of the codes were in the instrumental WoK; therefore, the instrumental WoK was removed from the analysis. The analysis then showed the percentage of codes for each individual for each of the three higher WoK: socializing, self-authoring, and

**Table 3. S05 percentages for Socializing (SOC), Self-Authoring (SA), and Self-Transforming (ST) for each**

S05	SOC	SA	ST
Q1	19	61	19
Q2	42	50	8
Q3	14	71	14
Q4	18	45	36

quarter.

self-transforming. The researcher then chose 33% as the cutoff point for determining an individual's WoK. This percentage was chosen because 25% indicated too many WoK for many individuals while 40% indicated that some people were not dominate in any WoK.

WoK emerged once the final analysis was complete. Some individuals were between two WoK, which confirms Drago-Severson's (2009) previous work with WoK. In all but one of these cases (S08), these were adjacent WoK in the hierarchy.

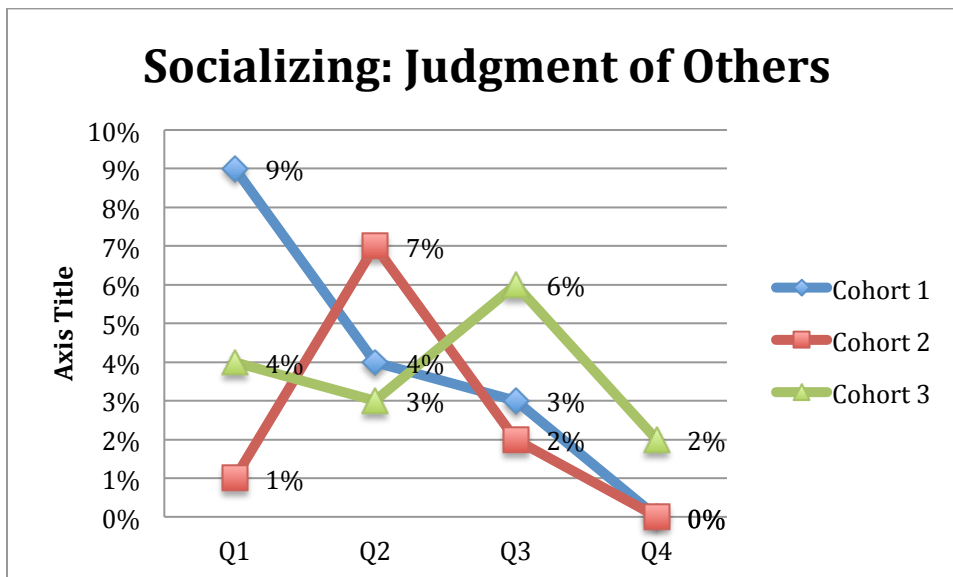
Table 4. Individual's WoK

Participant	Q1 WoK	Q2 WoK	Q3 WoK	Q4 WoK
S01	SOC/SA	SA	SA	SA
S02	ST	SA	SA	SOC/SA
S03	SA/ST	SOC/SA	SA	SA
S04	SA	SA/ST	SA/ST	SA
S05	SA	SOC/SA	SA	SA/ST
S06	SOC	SA	SOC/SA	SOC/SA
S08	ST	SOC/ST	SA	SOC/SA
S09	SA	SA	SA/ST	SOC/SA
S10	SOC/SA	SOC/SA	SOC/SA	SA
S11	ST	ST	SA/ST	SA/ST
S12	SOC/SA	SA	ST	SA
S201	SA	SA	SA/ST	SA
S202	SA	SA	SA/ST	SA
S203	SA	SOC/SA	SA	SA
S204	SA	SA	SA	SOC/SA
S205	SA	SA	SOC/SA	SA
S206	ST	SA	SA/ST	SA
S207	SA	SA	SA/ST	SA
S208	SA	SA	ST	SA
S301	SA	SA	SA	SOC/SA
S302	SA	SA	SOC/SA	SOC/SA
S303	SA	SA	SA	SA
S304	SA	SA/ST	SA	SA/ST
S305	SA	SA	SA	SA
S306	SA	SA	SA	SOC/SA
S307	SA	SA	SA	SOC/SA
S308	SA	SA	SA/ST	SA/ST
S309	SA/ST	SA	SA	SA/ST
S310	SA/ST	SA	SA/ST	SA
F303	ST	ST	ST	ST
F306	ST	ST	ST	SA/ST
F203	ST	ST	ST	ST
F207	ST	ST	ST	ST
F01	ST	ST	ST	ST
F03	ST	ST	ST	SA/ST

One of the few definitive changes over time occurred within the Judgment of Others attribute within socializing. In every cohort, over the four quarters of the program,

the percentage of comments coded as Socializing: Judgment of Others (SOC-JO) decreased. This finding was significant because the blended learning program researched proposes supporting the development of transformational learners. The Voice of Judgment (VOJ) as defined by Scharmer (2009) is “old and limiting patterns of judgment and thought. Without the capacity to shut down or suspend the VOJ, we will make no progress toward accessing creativity and never reach the deeper levels” (p. 246). The program researched appears to adequately shut down or suspend the VOJ in participants. In no other attribute were consistent increases or decreases clearly identified.

**Figure 3. Socializing: Judgment of Others over time in three cohorts.**



### Discussion

There is evidence that an individual's WoK is measurable through a content analysis of historical online threaded discussions of three yearlong cohorts in a blended learning environment. Appendix B contains the percentage data for each participant in each cohort. While several individuals had comments in two adjacent WoK in a quarter, no individual had 33% or more of comments in all three WoK. Lowering the threshold of comments to 25% or higher to indicate a WoK would result in only five individuals categorized in all three WoK.

Additionally, some individuals appear to show growth in their WoK throughout the blended learning cohort. In some cases, this growth connects to the spiral designed by Kegan (1982) and modified using Drago-Severson's WoK (Fig. 1). Drago-Severson (2009) and Kegan (1982) both contend that individuals growing towards the next WoK will have times when they are between two WoK or loop back to a previous WoK as the individual struggles to make what was subject object. For example, S05 (Table 3) starts the first quarter firmly in self-authoring. During second quarter, S05 loops back to socializing while maintaining some self-authoring behaviors. In third quarter, S05 returns firmly to self-authoring. Finally, in fourth quarter, S05 loops into both self-authoring and self-transforming. This is indicative of the type of growth that Drago-Severson defines in her work.

Other participants, like S303 and S305, start and end in self-authoring throughout the yearlong cohort. This lack of growth into a different WoK does not mean that the individual did not grow at all. It is possible that these individuals moved into self-transformation at other times throughout the quarter. Additionally, many individuals stay

in self-authoring for years before moving on to self-transforming. Other individuals never reach the self-transforming WoK (Drago-Severson, 2009).

Preparing individuals to meet adaptive challenges requires disorientation, which involves the development of new relationships, exposing conflict or letting conflict emerge, and letting individuals experience pressure that encourages growth without overwhelming them (Heifetz and Laurie, 2001). Throughout the threaded discussions that were coded, conflict among the group was minimal. More participants directly agreed with each other, and ideas brought forth were only challenged once or twice through the studied weeks of the cohort. Perhaps adding specific prompts that require individuals to choose one side or the other on a topic would engender some conflict in the group to support disorientation.

As a group, Cohort One exhibited more socializing behaviors and more individuals who were at least partially in the socializing WoK than the other two cohorts. Cohort One was also the cohort that started at a different time of year than the other two cohorts. It is not possible with only three cohorts to determine if the start time for this cohort impacted the amount of socializing. Additionally, there is no evidence that facilitation differences would account for the higher socializing in this cohort as the facilitators in all three cohorts were primarily in the self-transforming WoK.

Because no participants started at the instrumental level or exhibited instrumental phrasing in their postings, one possibility is that the application process, an example of which is outlined in Appendix C, minimizes the potential for these individuals to be admitted as part of the group. Even the few students who left the program before completing all four quarters were not in the instrumental WoK based on the analysis of

their limited comments. It is also possible that individuals who are at the instrumental WoK may not be interested in pursuing graduate level courses. This particular blended learning program is specifically marketed as a way to develop transformational leaders, which could potentially discourage individuals in the Instrumental WoK. The instrumental WoK may emerge from an exploration of threaded discussions of undergraduate courses.

By demonstrating that content analysis is a viable methodology for characterizing an individual's WoK in a blended learning environment, other researchers can utilize this method in future research on historical data from blended learning threaded discussions. Universities that offer blended learning now have more evidence that blended learning can support transformational learning.

Teachers in K-12 education may find this research useful in creating blended learning courses for students who are frequently absent or as an alternative to a snow day of missed learning. Additionally, K-12 educators who teach specialized classes, such as Advanced Placement (AP) or International Baccalaureate (IB) courses, especially in rural areas, could potentially use a blended learning model to develop higher-level dialogue given quality prompts to students preparing for college.

Facilitators in a yearlong blended learning program may consider adjusting question prompts for online discussion threads in order to foster more transformational growth amongst participants. Prompts towards the beginning of the program should seek to foster community, requiring more socializing WoK from participants. Questioning prompts near the middle of the yearlong program should seek to foster individuation, thereby pushing participants to self-authoring WoK. Finally, towards the end of the

program, prompts should seek to foster respectful debate among participants in order to encourage more self-transforming WoK.

Additionally, facilitators in all contexts could be coached to ask open-ended, nonjudgmental global questions that are designed to encourage reflection and seek input from others. Questions asked of individual participants can influence the participant's WoK, and can potentially push an individual towards self-transforming.

### **Limitations**

Each quarter included a different project to be completed by students. It is possible that the projects impacted WoK in different ways. Some projects may have required a deeper WoK than other projects.

Modules for Cohort One were taught in a slightly different order than Cohorts Two and Three, limiting comparisons between cohorts. To fully address this issue, all weeks for each quarter would need to be coded and compared across cohorts.

Quarter	Cohort 1	Cohort 2	Cohort 3
1	Introductory Module	Introductory Module	Introductory Module
2	Student Support Services	Developing People	Developing People
3	Melding Theory and Practice	Student Support Services	Student Support Services
4	Developing People	Melding Theory and Practice	Melding Theory and Practice

**Table 5. Order of modules taught.**

Each week, participants were asked to respond to a different prompt. These prompts were defined by the program director as either application prompts or content prompts. Application prompts encouraged participants to apply the readings to their current situation. Content prompts stimulated contributors to deepen their understandings of pedagogy. The type of prompt may have impacted WoK shared in that week.

Additionally, timelines may have impacted ways of knowing. The majority of participants work in public education. This may have resulted in more time during summer quarters to reflect deeper before responding to an online discussion thread. Alternatively, the final quarter may have resulted in less reflection if participants were feeling anxiety about finishing the program.

Finally, the coding element is open to subjectivity. Two researchers well-versed in the literature were able to achieve a high inter-rater reliability as previously described by assigning segments to be coded separately. When the segments coded were not the same length, inter-rater reliability dropped. The two researchers started the inter-rater reliability process by coding the same section without identifying specific segments and lengths. This inter-rater reliability was low; therefore, the researchers made the decision to identify specific segments for coding which increased inter-rater reliability.

### **Recommendations for Further Research**

Further research on how the facilitators' WoK impacted the cohort would inform facilitation practices for blended learning environments. Although the facilitators in these cohorts were firmly in the self-transforming WoK, it is possible that facilitators with different WoK may have different impacts on the WoK for individuals in the cohorts.

An additional research path would be to determine if the age of participants had an impact on the measured WoK. In Kegan's original research, he found that individuals could not reach the self-transforming WoK until their forties. Baxter-Magolda found in her research that college students in their twenties could achieve a self-transforming WoK. Is there evidence in a blended learning environment through online threaded discussions that individuals of all ages can reach the self-transforming WoK?



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## Appendix A

### Coding Dictionary

<p><b>Instrumental (INS)</b></p> <ul style="list-style-type: none"> <li>• Rule-driven (RD)           <ul style="list-style-type: none"> <li>▪ Language around defined expectations</li> <li>▪ Questions around expectation/rule following,</li> <li>▪ Blindly follow what is being told to do (Inst RD 3)</li> </ul> </li> <li>• Right way (RW)           <ul style="list-style-type: none"> <li>▪ Language that implied one way of thinking</li> <li>▪ Level 1/low level questions – what, who, when, how (procedurally)</li> <li>▪ No why or what if questions.</li> </ul> </li> <li>• Concrete consequences (CC)           <ul style="list-style-type: none"> <li>▪ Tangible in nature</li> <li>▪ Predefined consequences</li> <li>▪ No accommodations or considerations for alternative consequences</li> <li>▪ Concrete Qualities: Attributes, Events, and Consequences.</li> <li>▪ Noticeable Actions and Behaviors</li> </ul> </li> <li>• Own desires (OD)           <ul style="list-style-type: none"> <li>▪ Avoiding “getting caught”</li> <li>▪ “What’s in it for me?”</li> <li>▪ Cannot take another’s perspective fully</li> <li>▪ Others are either helpers or obstacles (perception).</li> </ul> </li> </ul>
<p><b>Socializing (SOC)</b></p> <ul style="list-style-type: none"> <li>• 1 - External authority (EA)           <ul style="list-style-type: none"> <li>▪ Others-focused</li> <li>▪ Seek out affirmation from one or two centralized others</li> <li>▪ <i>Generalizing from one context to another (added 2/22)</i></li> </ul> </li> <li>• 2 - Affiliation (AF)           <ul style="list-style-type: none"> <li>▪ Always agreeing with same other</li> <li>▪ Might add on to others’ thinking, but doesn’t present own thinking</li> <li>▪ Enhanced capacity for reflection on their actions and the actions of others</li> <li>▪ Shared reality: <i>co-constructed self (added 2/22)</i></li> <li>▪ Seeks approval and acceptance.</li> <li>▪ Avoids conflict</li> </ul> </li> <li>• 3 - Judgments of others (JO)           <ul style="list-style-type: none"> <li>• Taking things personally</li> <li>• Responsibility for feelings of others</li> <li>• Holding other’s responsible for their feelings; “(my principal, my colleague, etc.) made me feel _____, so I _____ (acted in a certain way).”</li> </ul> </li> </ul>
<p><b>Self-Authoring (SA)</b></p> <ul style="list-style-type: none"> <li>• 4 - Ideology (IE)</li> </ul>

<ul style="list-style-type: none"> <li>▪ Systems of beliefs</li> <li>▪ Self-generated ideology</li> <li>▪ “I believe...” with limited supporting evidence: “I see”, “I hear”, “I feel”;</li> <li>• 5 - Identity (ID) <ul style="list-style-type: none"> <li>▪ Concern with own competencies</li> <li>▪ “I am maintaining my own personal integrity, achieving my goals, and being guided by my ideals and values.”</li> <li>▪ “Am I living, loving, and working to the best of my ability and potential?”</li> <li>▪ Regulate relationships</li> <li>▪ Competence, achievement and responsibility are the uppermost concerns.</li> </ul> </li> <li>• 6 - Reasoning (RE) <ul style="list-style-type: none"> <li>▪ Balance contradictory feelings simultaneously</li> <li>▪ Conflict is viewed as a natural part of life</li> <li>▪ Conflict enhances perspectives for bigger goals than for self</li> </ul> </li> <li>• 7 - Action (AC) <ul style="list-style-type: none"> <li>• New perspectives result in actions: “Because of our dialogue, I...”; “Based on our new learning, I...”</li> </ul> </li> </ul>
<p style="text-align: center;"><b>Self-Transforming (ST)</b></p> <ul style="list-style-type: none"> <li>• 8 - Self-exploration (SE) <ul style="list-style-type: none"> <li>▪ Orients to multiple self-systems</li> <li>▪ Wants to grow and improve different aspects of self</li> <li>▪ Engages consistently in process of discernment about self</li> <li>▪ Own one’s part in conflict and wants to explore it with others</li> <li>▪ New sense of freedom to be themselves and let others be themselves.</li> </ul> </li> <li>• 9 - All perspectives (AP) <ul style="list-style-type: none"> <li>▪ Open to learning from other people</li> <li>▪ Engaging in conflict with others is an opportunity to let others inform and shape thinking</li> <li>▪ “How can other people’s thinking help me to enhance my own?”</li> <li>▪ “How can I seek out information and opinions from others to help me modify my own ways of understanding?”</li> <li>▪ Consistently judges and questions; wants to be changed by others.</li> </ul> </li> <li>• 10 - Complexity (CM) <ul style="list-style-type: none"> <li>▪ Able to understand and manage tremendous complexities</li> <li>▪ Second-order change; double-loop learning; transformational learning as opposed to informational</li> </ul> </li> </ul>

## Appendix B

### Individuals' WoK (in percentages)

Highlighting indicates WoK with more than 33% of dialogue for a given individual in that quarter.

Table B1. Cohort 1.

F01	SOC	SA	ST
Q1	10	20	70
Q2	22	0	78
Q3	0	22	78
Q4	0	14	86

F03	SOC	SA	ST
Q1	8	0	92
Q2	10	0	90
Q3	0	0	100
Q4	0	33	67

S01	SOC	SA	ST
Q1	52	39	9
Q2	27	69	4
Q3	23	68	9
Q4	28	50	22

S02	SOC	SA	ST
Q1	27	32	41
Q2	28	44	28
Q3	17	75	8
Q4	33	56	11

S03	SOC	SA	ST
Q1	30	37	33
Q2	33	63	3
Q3	23	64	14
Q4	28	67	6

S04	SOC	SA	ST
Q1	32	52	16
Q2	21	46	33
Q3	6	59	35
Q4	21	54	25

S05	SOC	SA	ST
Q1	19	61	19
Q2	42	50	8
Q3	14	71	14
Q4	18	45	36

S06	SOC	SA	ST
Q1	59	31	9
Q2	17	52	30
Q3	33	44	22
Q4	38	44	19

S08	SOC	SA	ST
Q1	5	21	74
Q2	35	25	40
Q3	22	78	0
Q4	33	53	13

S09	SOC	SA	ST
Q1	17	60	23
Q2	26	63	11
Q3	7	59	33
Q4	35	41	24

S10	SOC	SA	ST
Q1	39	39	21
Q2	35	53	12
Q3	40	53	7
Q4	29	71	0

S11	SOC	SA	ST
Q1	11	19	70
Q2	0	29	71
Q3	0	33	67
Q4	0	38	63

S12	SOC	SA	ST
Q1	38	52	10
Q2	15	59	26
Q3	24	32	44
Q4	23	58	19

Table B2. Cohort 2.

F203	SOC	SA	ST
Q1	29	0	71
Q2	0	0	100
Q3	0	0	100
Q4	0	0	100

F207	SOC	SA	ST
Q1	15	15	69
Q2	0	0	100
Q3	0	13	87
Q4	0	0	100

S201	SOC	SA	ST
Q1	25	46	29
Q2	24	47	29
Q3	12	52	36
Q4	22	56	22

S202	SOC	SA	ST
Q1	5	65	30
Q2	28	50	2
Q3	18	45	36
Q4	20	80	0

S203	SOC	SA	ST
Q1	21	73	6
Q2	40	53	7
Q3	9	73	18
Q4	32	50	18

S204	SOC	SA	ST
Q1	5	70	26
Q2	13	61	26
Q3	15	55	30
Q4	41	53	6

S205	SOC	SA	ST
Q1	17	67	17
Q2	14	71	14
Q3	38	54	8
Q4	17	67	17

S206	SOC	SA	ST
Q1	30	30	40
Q2	12	82	6
Q3	0	67	33
Q4	15	85	0

S207	SOC	SA	ST
Q1	24	54	22
Q2	24	50	26
Q3	19	45	35
Q4	29	54	18

S208	SOC	SA	ST
Q1	7	64	30
Q2	13	77	10
Q3	8	24	68
Q4	25	50	25

Table B3. Cohort 3.

F303	SOC	SA	ST
Q1	13	0	88
Q2	0	0	100
Q3	0	8	92
Q4	11	22	67

F306	SOC	SA	ST
Q1	0	20	80
Q2	30	30	39
Q3	25	25	50
Q4	7	57	36

S301	SOC	SA	ST
Q1	27	73	0
Q2	23	77	0
Q3	27	67	7
Q4	33	67	0

S302	SOC	SA	ST
Q1	29	53	18
Q2	24	76	0
Q3	44	44	12
Q4	43	43	14

S303	SOC	SA	ST
Q1	23	64	14
Q2	7	79	14
Q3	15	62	23
Q4	20	80	0

S304	SOC	SA	ST
Q1	14	80	6
Q2	7	57	36
Q3	29	65	6
Q4	22	44	33

S305	SOC	SA	ST
Q1	27	60	13
Q2	14	86	0
Q3	26	70	4
Q4	21	64	14

S306	SOC	SA	ST
Q1	11	74	14
Q2	28	60	12
Q3	18	53	29
Q4	43	52	5

S307	SOC	SA	ST
Q1	30	50	20
Q2	17	83	0
Q3	30	65	4
Q4	50	50	0

S308	SOC	SA	ST
Q1	25	44	31
Q2	27	64	9
Q3	18	45	36
Q4	17	42	42

S309	SOC	SA	ST
Q1	10	54	36
Q2	12	69	19
Q3	15	56	29
Q4	6	44	50

S310	SOC	SA	ST
Q1	19	43	38
Q2	27	62	12
Q3	28	36	36
Q4	20	52	28