Virtual Teaching Dispositions Scale (VTDS):
A Multi-dimensional Instrument to Assess Teaching Dispositions
in Virtual Classrooms

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Abstract

The aim of this study was to make salient the key characteristics and tacit competencies that build an effective repertoire of practice of virtually mediated instruction and to develop and validate a multidimensional instrument to assess the professional teaching dispositions that are associated with effective online instruction - the Virtual Teaching Dispositions Scale (VTDS). Items were developed using a theoretical model developed from the literature and construct validity was established using Q-Sort methodology. The resulting 25 item VTDS instrument was constructed and EFA produced a four factor results. Reliabilty analysis showed that the entire instrument had an unstandardized Cronbach's alpha of .891 with individual subscales ranging from .739 to .873.

Keywords: Dispositions, online teacher education, student expectations, scale development, professional development, teacher training, Q-Sort methodology, virtual instruction, distance education

Introduction and Background

Virtually mediated instruction, including Internet-based distance education, massive open online courses (MOOCs), and blended/hybrid courses, have become an increasingly important part of the higher education model. In a recent survey of over 2,800 colleges and universities in the United States, over 69% of the chief academic leaders stated that online learning was critical to their long-term strategies.

The same study reported that over 6.7 million students were taking at least one online course during the fall 2011 term, an increase of 570,000 students over the previous year. In addition, the proportion of all students taking at least one online course during 2011 was an all-time high of 32.0 percent (Allen & Seaman, 2013).

With an ever increasing number of students enrolled in virtually mediated courses, institutions need to identify what is effective online teaching and the professional teaching dispositions one needs to be an effective educator in virtual environments. Professional teaching dispositions are defined as those professional attitudes, values and beliefs demonstrated through both verbal and non-verbal behaviors as educators interact with students, families, colleagues, and communities and guided by beliefs and attitudes related to values such as caring, fairness, and honesty (NCATE, 2013).

Dispositions are definitional and philosophical (Dottin, 2009). The discourse pertaining to teacher dispositions occurs primarily in the K-12 realm, where "Dispositions indicate a teacher's tendency to act effectively on the behalf of the learning and well-being of his or her students" (Carroll, 2012, p. 38). NCATE (2013) defined dispositions as those principles, commitments, values and professional ethics that influence attitudes and behaviors of teachers. Dispositions extend to professional modes of conduct and the ways in which beliefs and attitudes are displayed by teachers' actions in and out of the classroom. Teachers with positive professional dispositions tend to act in ways that elevate the profession of teaching in the eyes of others (Ros-Voseles & Moss, 2007).

Therefore, the aim of this research was to make salient and make more explicit the key characteristics and tacit understandings that build a repertoire of practice for the effective orchestration of virtually mediated instruction. The purpose of this study was to develop and validate a multidimensional instrument to assess the professional teaching dispositions of educators in the virtual classroom- the Virtual Teaching Dispositions Scale (VTDS). Given that the VTDS framework is a hypothetical framework designed to identify the professional teaching dispositions of educators in the virtual classroom, the study used a combination of Q sort methodology and exploratory factor analysis (EFA) to establish the construct validity of the VTDS model.

Literature Review

Effective teaching includes professional dispositions. Dispositions are similar to professional beliefs or values systems, but they are more complex. One's disposition is manifested in one's behavior. It is behavior that is used to quantify the disposition. The disposition is therefore an indicator of future action.

Two threads of discourse can be identified when looking into definitions for dispositions (Thorton, 2006). The first includes a proliferation of terms where "approaches to assessing teacher dispositions often loosely equate to values, beliefs, attitudes, characteristics, professional behaviors and qualities, ethics, and perceptions" (Ritchhart, 2001, p. 54). From this perspective, a person's patterns of thinking and how one is predisposed to act inform an educator's practice, which are then manifested through particular kinds of action in the learning environment. The second view is more focused on professional characteristics and identifiable behaviors such as work attendance, preparation, work ethic, punctuality, sense of humor, and appropriate dress (Tichenor & Tichenor, 2004/2005). These behaviors are more clearly definable and measureable, especially in a conventional teaching environment, but they fall short in capturing a professional's educational practice. Dispositions have also been discussed (Combs, 1999; Usher, 2002) as affective qualities including empathy, or the ability to understand and accept another person's point of view; a positive view of others, or believing in the worth, ability, and potential of others; positive view of self, or believing in the worth, ability, and potential of oneself; authenticity, or having a sense of freedom and openness that allows one to be a unique person in honesty and genuineness; and meaningful purpose and vision, or having a commitment to purposes that is person-centered, broad, deep, freeing, and long range in nature (Usher, 2002). These qualities are more related to emotional and social intelligences.

Succinctly, dispositions are understood to be the enactment of a person's personal traits, values, and behaviors in a consistent manner within particular contexts (Carroll, 2012). It is the process in which instructors engage in the intellectual, cultural, ethical, and social actions and practices necessary to become effective instructors. Schussler, Stooksberry and Bercaw (2005) see the combination of these

practices as the development of a disposition that an instructor is increasingly able to enact with flexibility and intentionality within a specific context.

Siegel describes dispositions as "a tendency, propensity, or inclination to behave in a certain way under certain circumstances" (1999, p. 208). Ritchhart (2002) also suggests that dispositions are situation specific:

> Summarizing this process, dispositions connect values and other kinds of inner commitments with actions. They function as a process that connects valuing with strategies, or a repertoire of practice, directed with intentionality toward deliberate outcomes. Dispositions for ambitious teaching become a reliable characteristic of a particular teacher's practice with the development of a professional identity and repertoire of practice that grow out of acting strategically, achieving desired outcomes, and recognizing oneself as a person capable of doing so. (p. 43)

One may think of the term dispositions as the process of developing a repertoire and identity of educational practice, what Blythe and associates (1998) term *performances of understanding*. It is the process in which instructors engage in the intellectual, cultural, ethical, and social actions and practices necessary to become effective instructors.

The idea that dispositions are changeable is a commonly held theory (e.g., Judge & Bretz, 1993; Perkins, Jay, & Tishman, 1993; Mumford, 2001). Dewey (1916, 1922) suggests that dispositions are human qualities which can be altered as a result of educational experiences. Wasicsko (2007) categorized dispositional attributes by their level of difficulty to change. He identified those that were difficult to change as related to warmth, enthusiasm, commitment, optimism, and humor. On the other hand, he found that attributes such as knowledge, punctuality, and appearance could be altered as a result of experience and professional development.

Studies have been conducted on student expectations of instructors in the virtual classroom. Young (2006) uncovered seven items, identified by students, that strongly correlated to what students identified as features of effective online teaching: adapting to student needs, using meaningful examples, motivating students to do their best, facilitating the course effectively, delivering a valuable course, communicating effectively, and showing concern for student learning. The students also stated the instructors should be flexible and adapting to the needs of the students. Given the diversity of the students who enroll in online courses, the expectations gleaned from these studies vary considerably (Stevenson, MacKeogh, & Sander, 2006), but we do know that students create their expectations of virtual instructors from prior experience with online instructors, communication with peers who have taken online courses, or from their own previous educational experiences (Forrester & Parkinson, 2006). Orso and Doolittle (2012) found that the ability of an online instructor to meet students' needs significantly impacted student success. In addition, they found that students enrolled in online courses expected quick response from instructors. In a study designed to identify personality types and instructors' willingness to embrace technology, Chambers, Hardy, Smith, and Sienty (2003) used the Myers-Briggs Type Indicator and found that intuitive/thinking types were more prone to using technology in teaching while sensory/feeling types were least likely to use technology in the classroom, suggesting, perhaps, that various educator dispositions may also perform differently in the virtual learning environment.

Within the virtual learning environment, readiness scales have been developed for online learners in aims of identifying qualities and traits that predispose learners to successful learning in the online environment (Feldman, 2007; Geoghegan, 1995; Hart, 2012; Hung, Chou, Chen, & Own, 2010; Kerr, 1997; Mioduser, Nachmias, Oren, & Lahav, 2000; Stansfield, McLellen, & Connolly, 2004; Yukselturk & Bulut, 2007). Warner, Christie, and Choy (1998) defined student readiness for online learning in terms of a student's preferences for the form of delivery; a student's confidence in using electronic media for learning and computer-mediated communication; and a student's ability to engage in autonomous learning. McVay's (2001) instrument for measuring online learner readiness focuses on student behaviors and attitudes as predictors. McVay (2001), Smith (2000, 2005), and Garrison (1997) considered self-directed learning to be a critical factor in online learner dispositions. The READI Assessment (now called SmarterMeasure) is a tool designed to determine student readiness for online learning. Some internal tools have been adopted by other institutions such as Kerr, Rynearson, and Kerr's (2006) Test of Online Learning Success (TOOLS), but it is paramount to note that "most, if not all, of these tools were designed to

measure student online readiness, not faculty readiness," (p. 345) even though it has been suggested that one can infer that student qualities could carry over to help understand instructors as well (McLawhon & Cutright, 2012; Palloff & Pratt, 2010).

Although researchers have been able to identify key characteristics of effective teaching in the face-to-face classroom (e.g., Combs, 1999; Feldman, 1984, 1989), the same cannot be said for the identification and assessment of the professional teaching dispositions in the virtual classroom. Cavanaugh, Gillan, Kromrey, Hess, and Blomeyer (2004) reported that teacher quality was an important factor in online education, yet little data exists on the influence of teacher quality in the virtual classroom. A review of research by Cyrs (1997) uncovered several competences needed for the virtual environment, including course planning and organization, verbal and nonverbal presentation skills, the ability to use questioning strategies and the ability to involve and coordinate student activities among several sites, supported by Easton (2003) and Roblyer and McKenzie (2000). More recently, Varvel (2007) constructed a competency document for online instructors in which he outlined their alignment to Illinois State Board of Education Professional Teaching Standards and their indicators. Bonk, Kinley, Hara & Dennen (2001) identified four major areas of roles of online instructors including pedagogical, social, managerial, and, technological. One may also seek references on competencies and roles of effective online instruction (Avgerinou & Anderson, 2007; Baran, Correia, & Thompson, 2011; Bawane & Spector, 2009; Baille, 2011; Bonk, Kirkley, Hara, & Dennen, 2001; Chua & Lam, 2007; Copolla, 2005; Edwards, Perry, & Janzen, 2011; Jelfs, Richardson, & Price, 2009; Kouzes & Posner (2003); Oliver, Osborne, & Brady, 2009; Spangle, Hodne, & Schierling, 2002; Young, 2006; Young, Cantrell, & Shaw, 2001), finding an array of viewpoints.

Scales and instruments specifically addressing the characteristics and dispositions of online instructors are few (Bangert, 2006), but profiles of and factors necessary to prepare effective online instructors can be found (Comeaux & McKenna-Byington, 2003; Cook, 2007; Crowther, Keller, & Waddoups, 2004; Dede, Ketelhut, Whitehouse, Breit, & McCloskey, 2009; Fuller, Norby, Pearce, & Strand, 2000; Hathaway & Norton, 2012; Hewett & Ehmann; 2003; Kumar, Rose, & D'Silva, 2008; MacKillop, 2007; McCombs, 2001; McCombs & Vakili, 2005; McLawhon & Cutright, 2012; Yang & Cornelious, 2005).

While educator dispositions are seldom referenced in online education literature, the notion of instructor *presence* in the online learning environment is prevalent in the literature (Anderson, Rourke, Garrison, & Archer, 2001; Archer, Garrison, Anderson, & Rourke, 2001; Garrison, Anderson, & Archer, 2000; Gorsky & Blau, 2009; Hult, Dahlgren, Hamilton, & Sölerströn, 2005; LaPointe & Gunawardena, 2004; Palloff & Pratt, 2010; Pelz, 2004; Rourke, Anderson, Garrison, & Archer, 1999; Russo & Benson, 2005), and plays a significant role in understanding successful virtual learning environments. The notion of *presence* in the online environment is defined as "the ability of learners to project themselves socially and affectively into a community of inquiry (COI)" (Rourke, et al, 1999, p. 1). Borrowing from the COI model, the identified areas of presence were used as a starting point for developing a conceptual model for virtual educator dispositions.

Chickering and Gameson (1987), in their classic theoretical model for higher education classrooms, suggested that student success is related to instruction that encourages: 1) student-faculty contact; 2) cooperation among students; 3) active learning; 4) prompt feedback; 5) time on task; 6) high expectations; and 7) respect for diverse ways of learning. However, Relan and Gilliani (1997) argue that virtual and blended learning are distinct and are dependent on different conditions than conventional instruction. The COI model (Rourke, et al., 1999) defined three core dimensions of importance for learners in virtual learning environments, including cognitive presence, teacher presence, and social presence. Pelz (2004) proffers that individuals who become exemplary online educators tend to create carefully designed online courses that promote presence, and more specifically educators who actively work to address cognitive, teacher, and social presence.

The notion of presence in virtual instruction represents the ability of the instructor to project themselves into a learning community. This virtual presence is a constellation of Cognitive/Expert Presence, Instructor Presence, and Social Presence (Coppola, Hiltz, & Rotter, 2002; Rourke, Anderson, Garrison, & Archer, 2001). Borrowing from this model, the three interactive areas of presence were adapted as a conceptual framework for understanding virtual instructor presence in this study, representing a repertoire of practice, or virtual instructor disposition.

Social constructivism and social interaction theory posit that the mechanisms for learning and meaning-making are social interactions. The theoretical assertion adopted here, then, is that through social interaction within the learning environment an individual's personality, beliefs and common behaviors are manifested within the context of online instruction and become the substance within the cognitive, pedagogical, and social domains of instruction. All three domains of presence (cognitive, pedagogical, and social) are enacted and achieved through social interaction.

For the purpose of model development, the domains of presence are defined and operationalized as follows: *Cognitive presence* is understood as the 'ideas,' and more precisely defined here as the interactive behaviors that contribute to meaning-making, provide content matter, offer explanation/clarification, and build ideas, understanding, and learning discourse; *Pedagogical presence* is understood as the interactive behaviors that enhance design, organization, management, effective communication and feedback, and facilitation of active learning; *Social presence* is demarcated as the interactive behaviors that reduce social distance between the instructor and learners, and between learners, and enhance social cohesion in the learning environment. Together, the three defined domains create the conceptual framework employed for the development of items based on the personality traits, pedagogical values, and behaviors unique to each domain. Table 1 illustrates the relationship between personality traits, performances of pedagogical values, and their manifestation in behaviors which served as a foundation for items developed for the Virtual Teaching Dispositions Scale (VTDS).

Table 1. *Theoretical Relationships used for Item Development*

Personality Traits	Performances of Pedagogical Values	Behavioral
Cognitive/Expert Presence		
Openness to Experience	Providing appropriate and relevant subject matter	Clear writing
Intellect	Selecting appropriate content	Offers explanations and elaborations
	Demonstrating expertise and depth of knowledge	Uses scholarly references and resources
	Modeling scholarly habits and communication	Comments, arguments, and positions founded in evidence, literature, and experience
	Communicate comfortably and confidently in writing	Offers clarification and disambiguates content
	Reinforcing concepts, ideas, content	Provides examples and evidence related to content
	Anchoring learning strategies in experience	Incorporates additional material, information, and resources
Pedagogical Presence		
Conscientiousness	Providing leadership and guidance	Logs in daily and is available to students
	Designing an effective learning environment	Responds to and continues threaded discussion
	Organizing content and information	Responds to and answers questions and assertions
	Scaffolding learning content and providing course structure,	Provides rejoinders and prompts further discussion and requests

	offering review and recursive learning opportunities	clarification and further elaboration
	Managing and monitoring course and learning activities	Challenges views and draws out explanations
	Facilitating active learning	Gives directions and provides suggestions
	Instigating, supporting, and sustaining critical thinking and discourse	Provides for student-student interaction and peer learning opportunities

	Social Presence	
Agreeableness	Projecting oneself socially and affectively	Offers self-disclosure
Extroversion	Welcomes diverse ideas, cultures, identities, and ways of learning	Addresses learners by name
Optimism	Inviting participation and conversation	Uses inclusive language
	Encouraging continued and prolonged communication between the instructor and learners, as well as between peers	Uses phatics and vocatives in dialogue with learners
	Attending to learners' current needs	Personalizes the learning space
	Building and sustaining relationships	Offers individual acknowledgement and learner affirmation
	Affirming individual and group identities	Offers encouragement and complements

Therefore, the aim of this study was to make salient the key characteristics and tacit competencies that build an effective repertoire of practice of online instruction, to create a mechanism for experienced virtual educators to identify, and prioritize the characteristics and dispositions that are associated with effective online instruction.

Methods

The initial stages of development for the Virtual Teaching Dispositions Scale (VTDS) involved generating an initial pool of candidate items, subjecting these items to the scrutiny of experts (content validation), further refinement of the items by the authors, and pilot testing of the instrument. An exploratory factor analysis (for construct validation) and reliability analysis were conducted on these pilot data, which subsequently led to additional refinement of the instrument.

Preliminary Instrument Development

An initial pool of 50 original items was generated by the research team based on the literature and the conceptual framework. Each item was designed to tap one of the three domains identified by the conceptual framework (expert/cognitive presence, instructor presence, and social presence). Specifically,

these items were constructed as simple statements which described some behavioral pattern, disposition, or characteristic that is indicative of one of the three underlying domains.

This set of candidate items was inspected by subject-matter experts (SMEs) to ensure content validity. The items to be retained for the pilot instrument were determined by a modified version of Lawshe's (1975) content validity ratio using ratings collected via the Q methodology (also known as Q factor analysis). Although Q methodology is somewhat similar to conventional factor analysis (also known as R factor analysis), there is a fundamental difference—the former method operates on correlations among raters, where the latter method uses the correlations among items. Q methodology was used here since the basic form of the content validity ratio operates on only the overall proportion of all SMEs that rate an item to be "essential" (rather than "useful" or "not necessary"). In other words, Lawshe's method assumes all judges share the same general perspective on the topic under consideration. Thus Q methodology was integrated with Lawshe's method. This allowed for multiple groups of SMEs with similar opinions to emerge, which in turn allowed for higher intra-class correlations within those groups of SMEs with shared perspectives.

College-level instructors known to have at least five years of experience teaching online courses were recruited to serve as SMEs. Twenty-four SMEs agreed to serve as judges. These SMEs were sent an email with a link to an online Q-sorting instrument (flashQ; Hackert & Braehler, 2007) where they would rate each candidate item with regards to its relative importance in being an effective online instructor. The specific condition of instruction used was, "In your opinion, what is the relative importance of the given disposition, characteristic, or trait for being an effective online teacher?" The SMEs were then instructed to arrange each of the 50 statements on a structured response array that was scored from 1 (less important) to 11 (more important). A mockup of the response array is shown in Figure 1. The SMEs could provide general comments as well as comments specifically regarding the statements they rated as the most and least important. None contributed potential items of their own.
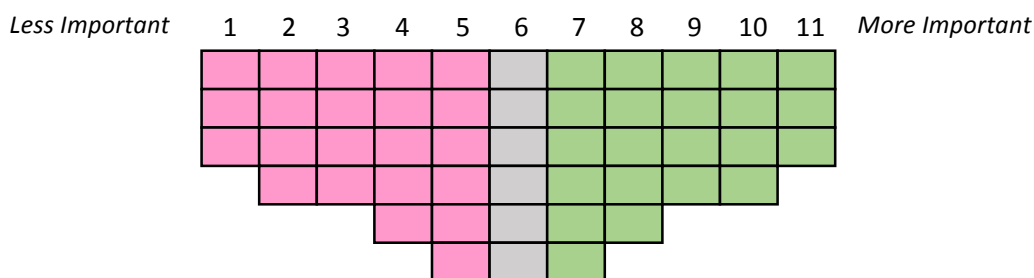

Figure 1. Mockup of the Q-sort response array. The array shown is approximately one-fifth normal size. Each cell in the array is 3.5 by 4.5 cm with standard screen resolution.

Similar to R factor analysis, the Q methodology extracts one or more factors and computes a set of scores for each factor. However, factors in Q methodology are based upon groups of raters with similar Q-sorts (sets of ratings); thus, these factors represent a shared perspective or archetype viewpoint within the context of the collection of statements. A set of factor scores (known as a *theoretical array*) is computed for each factor. This is essentially a hypothetical Q-sort that roughly represents a given perspective. In this study, an item was retained if it achieved a rating of 7 or greater (i.e., above the midpoint on the array) on at least one of the theoretical arrays.

Three theoretical arrays emerged from the Q-sort data, and 39 items were retained to be used in the pilot instrument. Retained items were then modified to be a declarative statement that a respondent could assess the degree to which the statement accurately characterized him or herself. For example, the simple statement "provides constructive feedback" was used for the q-sorting process, but this was changed to the declarative statement "I provide constructive feedback" for the pilot instrument.

Pilot Instrument

The pilot instrument consisted of 39 candidate items, each utilizing a four-point modified Likert scale (no neutral or NA). The response options were *very untrue of me*, *not really true of me*, *somewhat true of me*, and *very true of me* (scored as 1 to 4, respectively). A web-based instrument was used for data

collection. This online questionnaire form allowed for all items to require a response, thus there were no missing data. Additionally, the online form randomized the ordering of items for each participant.

Participants

Purposive volunteer sampling was used to recruit a sample for pilot testing the VTDS. A listing of emails (listserv) for all faculty and graduate teaching assistants at a large public university in the north central United States served as the sampling frame (N_0 = 1831). Participants were recruited from this listing via email with an initial invitation and two follow-up reminders. As this was a volunteer sample, it should be noted that self-selection of respondents is a potential source of bias.

Each email included a brief explanation of the purpose of the study and a link to a web-based questionnaire for those email recipients who decided to participate. Upon opening the link to the online instrument, participants were first presented with a small set of demographic and background information questions. When finished with this initial section, participants were then automatically directed to the section containing the 39 candidate items. At this point the participants were instructed to read each item carefully, and then indicate how accurately each statement describes them as an educator on the previously described four-point rating scale.

Data were collected anonymously for a total of 165 volunteers over a three-week period. Three of these respondents were removed (non-teaching faculty), bringing the final sample size to 162. Although the questionnaire was anonymous, participants were asked to provide basic background information. Of this sample of 162 participants, 20 (12.3%) had bachelor's degrees, 45 (27.8%) earned master's degrees, and 97 (59.9%) held doctorates (PhD, EdD, or JD). The distribution of current teaching positions for the sample was 98 (60.5%) professors (assistant, associate, or full), 34 (21.0%) lecturers/instructors, 12 (7.4%) teaching assistants, and 18 (11.1%) reported as other (e.g., adjunct faculty, extension educators). This sample was also fairly diverse in the level of student taught: 66 taught undergraduates only, 20 taught graduates only, 58 taught both undergraduate and graduate students, and 18 reported teaching other populations of students (e.g., agricultural professionals, community members). The reported years of experience as an educator ranged from 1 to 52, with a mean of 14.3 years, median of 12 years, and a standard deviation of 10.4 years. The number of semesters teaching online ranged from 0 to 40, with a mean of 4.3, a median of 2, and a standard deviation of 6.4 years. Sixty-six reported that they had never taught online.

Results

The common-factor model is appropriate here as the goal of this analysis was to explore the latent structure of the instrument (Costello & Osborne, 2005). Hence, factors were extracted from the correlation matrix using principal-axis factoring with SPSS (version 21).

Initially, a three-factor solution was explored in accordance with the three domains from the conceptual framework. Yet, the three-factor solution did not produce a very clear or interpretable factor structure. Various analytical indicators for dimensionality were computed, such as parallel analysis (4 factors), SKMO (Hill, 2011) (5 factors), MAP test (5 factors), scree plot (6 factors), and the Kaiser-Guttman rule (8 factors). However, the primary criterion for determining the number of factors to extract was the interpretability of the factors, which clearly suggested a four-factor solution. Thus, four factors were initially extracted from this set of 39 items and rotated to an oblique solution using direct oblimin rotation.

Items were further scrutinized to remove those that were conceptually inconsistent with other items in the subscale, did not have a salient loading on a factor (pattern coefficient of .35 or greater), or displayed sizeable cross loadings (pattern coefficients of .35 or greater on two or more factors). Items were also removed if they were suspected to be biased by social desirability or were observed to have little variance since such items distorted the factor solution by creating a general factor.

Items were eliminated one at a time, and an EFA solution was recomputed after the removal of each item. Ultimately, 14 of the 39 items were eliminated from the instrument. Thus, a final set of 25 items was established.

After removal of the unessential items, a final EFA was performed on the set of 25 items. This set of items showed very good sampling adequacy (KMO = .845). Various analytical dimensionality tests indicated

from three to five factors (parallel analysis [3 factors], SKMO [4 factors], MAP test [3 factors], scree plot [4 or 5 factors], and the Kaiser-Guttman rule [5 factors]). Interpretability again indicated a four-factor solution, which was further supported by the indication that the four-factor structure remained stable as extraneous items were removed.

Four factors were extracted, which accounted for 46% of total variance after a direct oblimin rotation. As this was an oblique solution, factors were allowed to correlate (see Table 2). The inter-factor correlations were relatively weak, ranging from .155 to .383, yet not small enough to warrant an orthogonal factor solution.

Table 2. *Inter-factor Correlations (Final Item Set)*

Factors	Virtual/Tech.	Pedagogical	Expert/Cognitive
Social	.155	.192	.343
Virtual/Tech.		.310	.212
Pedagogical			.383

The loading (pattern) matrix for the rotated solution is given in Table 3. This loading matrix very nearly achieved simple structure with only minor cross-loadings for items #09 and #37.

Table 3. *Loading (Pattern) Matrix and Communalities for Oblimin Four-Factor Solution*

Items	A Priori Construct	Factor 1	2	3	4	Communalities
#34	Social	.642				.514
#33	Social	.585				.579
#30	Social	.521				.326
#37	Social	.518	.300			.350
#35	Social	.468				.526
#29	Social	.420				.349
#04*	Expert/Cog.		.853			.709
#31*	Social		.725			.631
#38*	Social		.699			.564
#23*	Pedagogical		.685			.498
#32*	Social		.679			.518
#18*	Pedagogical		.650			.478
#12*	Pedagogical		.508			.346
#07	Expert/Cog.		.423			.279
#15	Pedagogical			.692		.586
#21	Pedagogical			.660		.489
#13	Pedagogical			.567		.426
#14	Pedagogical			.495		.328
#11	Pedagogical			.381		.311
#03	Expert/Cog.				.726	.552
#06	Expert/Cog.				.590	.492
#02	Expert/Cog.				.568	.545
#09	Expert/Cog.		.318		.492	.398
#08	Expert/Cog.				.484	.491
#01	Expert/Cog.				.403	.252

Note. For clarity, loadings not reaching salience (below .30) are not shown. The original 39 items is shown in Appendix A.

*Item addresses some technology-related aspect.

The preliminary conceptual framework established three basic domains—namely, social presence, pedagogical presence, and expert/cognitive presence. The meanings of these three factors are readily discernible from an examination of the subsets of items that loaded on each factor (Table 4). A particularly noticeable outcome was that all subsets of items loading on these three factors were designed to measure the same dimension (a priori construct).

Table 4. *Item Subsets for Each Factor*

Item #	A Priori Construct	Item Stem	Loading
		Factor 1: Social Presence	
#34	Social	I am empathetic to the needs of my students.	.642
#33	Social	I relate with students as people.	.585
#30	Social	I am tactful with students in emotionally stressful situations.	.521
#37	Social	I am flexible in dealing with students' needs (due dates, absences, etc.).	.518
#35	Social	I try to establish a welcoming learning environment.	.468
#29	Social	I understand the needs of my students.	.420
		Factor 2: Virtual/Technological Presence	
#04	Expert/Cog.	I adapt well in online delivery formats.	.853
#31	Social	I maintain genuine and meaningful contact in online formats.	.725
#38	Social	I project interpersonal skills in the online environment.	.699
#23	Pedagogical	I strive to continually improve performance in the online classroom.	.685
#32	Social	I maintain a highly visible presence in online formats.	.679
#18	Pedagogical	I am intrinsically motivated to master new information technology.	.650
#12	Pedagogical	I utilize new technologies to enhance learning.	.508
#07	Expert/Cog.	I communicate comfortably almost entirely through writing.	.423
		Factor 3: Pedagogical Presence	
#15	Pedagogical	I respond to student inquiries in a timely manner.	.692
#21	Pedagogical	I return work to students promptly.	.660
#13	Pedagogical	I create a schedule and stick to it.	.567
#14	Pedagogical	I am organized.	.495
#11	Pedagogical	I communicate clearly and effectively in writing.	.381
		Factor 4: Expert/Cognitive Presence	
#03	Expert/Cog.	I demonstrate commitment to academic expertise.	.726
#06	Expert/Cog.	I have a passion for education.	.590
#02	Expert/Cog.	I make content meaningful for the learner.	.568
#09	Expert/Cog.	I anchor learning strategies in the context of my subject matter.	.492
#08	Expert/Cog.	I adapt learning strategies within the context of my subject matter.	.484
#01	Expert/Cog.	I am very knowledgeable in my content area.	.403

An additional factor emerged from the EFA that represents the virtual/technological presence. Although the items that load on the virtual/technological factor were designed to tap one of the original three domains, an inspection of these items clearly showed their technology-oriented nature. Items #04, #12, #18, #23, #31, #32, and #38 all directly address issues related to a teacher's online presence or integration of technology. For example, item #04 reads, "I adapt well in online delivery formats." Item #07 ("I communicate comfortably almost entirely through writing") is the only item to load on this factor without an obvious and overt virtual or technological aspect. However, this item does address a vitally important mode of communication for teaching in an online format; thus it was retained for this factor.

Instrument Reliability

Once a conceptually and statistically sound solution was produced by the EFA, Cronbach's Alpha was computed for each subscale (Table 5). All four subscales showed good internal consistency, with instructor presence showing the lowest alpha at .739. Item-scale statistics were inspected, but no additional items were eliminated during this phase. The alpha coefficient for the entire instrument (all 25 items) was .891.

Table 5. *Subscale Reliabilities*

Subscale	Cronbach's Alpha	Number of Items
Virtual/Technological Presence	.873	8
Pedagogical Presence	.739	5
Expert/Cognitive Presence	.801	6
Social Presence	.783	6

Next Steps: Scoring Protocol

At this time, there is no definite scoring protocol or dissemination procedure. The purpose of this article is to discuss the psychometric development of the instrument. Our present study does indicate that the VTDS can produce reliable and valid results, but we need additional trials to confirm the psychometric properties and to further fine-tune the instrument.

Each item of the VTDS will be scored by the respondents on a 1 to 4 scale (1 for "very untrue of me," etc.). This is a basic summative scale (i.e., the sum of the items for each subscale, raw score), so the scores for each subscale are summed to produce four subscale raw scores. Thus, the ranges of scores for the subscales are as follows: Virtual/Technological Presence (8 to 32), Pedagogical Presence (5 to 20), Expert/Cognitive Presence (6 to 24), and Social Presence (6 to 24). Each subscale score provides an indication of the relative amount of the corresponding trait.

In the next phase of the larger project, we will be creating professional development modules based on the instrument. At that time, we will be able to administer the VTDS electronically and when the respondents receive their scores they will be provided information about the professional development modules.

Discussion

The objective of this study was to make salient the key characteristics and tacit competencies that build an effective repertoire of practice of virtually mediated instruction and to develop and validate a multidimensional instrument to assess the professional teaching dispositions that are associated with effective online instruction. The instrument resulting from this study, the Virtual Teaching Dispositions Scale (VTDS) (See Appendix B), provides a mechanism for instructors to self-assess their teaching dispositions in relations to the virtual classroom.

Our study was grounded on the notion of presence in virtual instruction representing the ability of the instructor to project themselves into a learning community (Coppola, Hiltz, & Rotter, 2002; Rourke, Anderson, Garrison, & Archer, 2001). The three areas of presence forming the conceptual foundation of this study (cognitive, pedagogical, and social) were strongly identified in the validation of the instrument and thus supports the need for instructors to possess fundamental disposition attributes, such as empathy, timeliness, and passion. These attributes identify character-related dispositions and relate to an individual's personality and behavior (Jung & Rhodes, 2008). Personality dispositions are viewed as "…latent qualities or conscious and controllable human responses" (Jung & Rhodes, 2008, p. 650).

In contrast, the fourth disposition identified in this study, Virtual/Technological Presence, has less to do with personality and behavior than with competence. While items in the Virtual/Technological Presence domain do not assess instructors' technical expertise in the delivery of content, they do suggest that instructors need to possess an innate desire and motivation for continual improvement in their ability to deliver high quality content.

Conclusion

Chief among the implications associated with this study are ways in which the VTDS might impact professional practice. Of particular interest are the tangible benefits associated with the VTDS. Two related benefits have surfaced which have the potential to positively impact professional practice and learner outcomes.

The first identified concept is that of professional awareness. Professional awareness as mindfulness which is particularly relevant to one's professional practice. Completion of the VTDS, as is the case with other similar types of self-assessments, inherently brings forth an awareness of ones' strengths and weaknesses as identified in conjunction with a particular skill set and instructional paradigm. In the case of the VTDS, participants will be able to identify their dispositional standing in relation to the field of virtual teaching. Professional awareness, however, while extremely important, is not nearly enough unto itself to significantly impact instruction as it may result in latent knowledge if not taken a step farther. Latent knowledge does not impact professional practice, which is the ultimate goal of this research. Professional awareness, however, when engaged in as a larger effort of professional development leads to the second outcome.

Informed action is the next step in the process. Informed action, in association with the VTDS, means that the awareness that one comes into is used strategically in the development and implementation of professional development activities which will address any identified weaknesses as related to one's virtual teaching dispositions, and consequentially, one's professional practice. While awareness speaks to knowing, action speaks to doing. After one knows what dispositions are weak, they can seek out necessary resources to strengthen and improve the outcomes associated with their virtual teaching efforts. In this way, professional awareness and informed action, as a result of VTDS, have the potential to positively and significantly impact the field of virtual teaching through improved professional practice.

There are indeed challenges to assessing dispositions, whether in the traditional or virtual classroom, and there exists a void in the research identifying the relationship of dispositions to student outcomes. Therefore, our next steps will be assessment of effectiveness of the VTDS through longitudinal studies to determine the correlation between instructors' dispositions and student learning.

Specifically, we intend to complete a cross-cultural validation study to explore the issue of virtual teaching dispositions with respect to culture learning and their associated implications. Additionally, an instructor-student virtual teaching disposition alignment study will be completed wherein we attempt to identify similarities and dissimilarities in the perceived importance of dispositional traits from the unique perspectives of instructors and students. The information gleaned from such a study will enable us to further pursue the types of considerations we must make to improve instruction (and communication) within virtual teaching environments. Finally, we intend to develop professional development modules which will assist instructors in addressing areas of perceived weakness related to their virtual teaching dispositions. It is through this phase of the research that we intend to help instructors transition from professional awareness to informed practice.

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Appendix A

Original Items Used in Exploratory Factor Analysis

Item #	Item Stem
1	I am very knowledgeable in my content area.
2	I make content meaningful for the learner.
3	I demonstrate commitment to academic expertise.
4	I adapt well in online delivery formats.
5	I like the subject I teach.
6	I have a passion for education.
7	I communicate comfortably almost entirely through writing.
8	I adapt learning strategies within the context of my subject matter.
9	I anchor leaning strategies in the context of my subject matter.
10	I communicate clearly and effectively orally.
11	I communicate clearly and effectively in writing.
12	I utilize new technologies to enhance learning.
13	I create a schedule and stick to it.
14	I am organized.
15	I respond to student inquiries in a timely manner.
16	I am fair.
17	I am ethical in decision making.
18	I am intrinsically motivated to master new information technology.
19	I am intrinsically motivated to improve my instructional practices.
20	I provide constructive feedback.
21	I return work to students promptly.
22	I foster a collaborative learning environment among students.
23	I strive to continually improve performance in the online classroom.
24	I maintain a student-centered learning environment.
25	I adapt my teaching based upon learner needs.
26	I am approachable.
27	I am honest.
28	I initiate frequent communication.

29	**I understand the needs of my students.**
30	**I am tactful with students in emotionally stressful situations.**
31	**I maintain genuine and meaningful contact in online formats.**
32	**I maintain a highly visible presence in online formats.**
33	**I relate with students as people.**
34	**I am empathetic to the needs of my students.**
35	**I try to establish a welcoming leaning environment.**
36	**I have a positive outlook towards education.**
37	**I am flexible in dealing with students' needs (due dates, absences, etc.)**
38	**I project interpersonal skills in the online environment.**
39	**I believe increased learning can occur when work/life/knowledge experiences are shared among peers.**

Appendix B

Virtual Teaching Dispositions Scale (VTDS)©

Response Anchors:

1 = Very untrue of me (includes having no experience in that situation)

2 = Not really true of me

3 = Somewhat true of me

4 = Very true of me

1. I am empathetic to the needs of my students.
2. I relate with students as people.
3. I am tactful with students in emotionally stressful situations.
4. I am flexible in dealing with students' needs (due dates, absences, etc.).
5. I try to establish a welcoming learning environment.
6. I understand the needs of my students.
7. I adapt well in online delivery formats.
8. I maintain genuine and meaningful contact in online formats.
9. I project interpersonal skills in the online environment.
10. I strive to continually improve performance in the online classroom.
11. I maintain a highly visible presence in online formats.
12. I am intrinsically motivated to master new information technology.
13. I utilize new technologies to enhance learning.
14. I communicate comfortably almost entirely through writing.
15. I respond to student inquiries in a timely manner.
16. I return work to students promptly.

17. I create a schedule and stick to it.

18. I am organized.

19. I communicate clearly and effectively in writing.

20. I demonstrate commitment to academic expertise.

21. I have a passion for education.

22. I make content meaningful for the learner.

23. I anchor learning strategies in the context of my subject matter.

24. I adapt learning strategies within the context of my subject matter.

25. I am very knowledgeable in my content area.