Assessing Dispositions of the Online Learner (DOL): To Improve Learning Gains

Suzanne Ensmann
The University of Tampa

Patricia Johnston
The University of Tampa

Gina Almerico
The University of Tampa

Adrianne Wilson
The University of Tampa

"Your Attitude Determines Your Altitude" (Dern, 2011). Exponential growth of evolving technologies necessitates learners be equipped not just with software skills but dispositions to master information overload. It is the attitude of an individual which shapes these dispositions that ultimately supports their ability to master competencies in an online environment. Assessing dispositions during online coursework could serve as the gateway to provide learners with directed information to become more dispositionally sound. The identification of validated dispositions becomes imperative so that adjustments are made based upon correct indicators.

EXECUTIVE SUMMARY

The Purpose and Iterative Construct of the Dispositions of the Online Learner (DOL)

This study emerged at the request of educators using the Educational Disposition Assessment (Johnston, Wilson, & Almerico, 2018) instrument designed for pre-service teachers. The intent of this study was to determine the dispositions of the successful online learner from the expertise in the field of online education and produce an instrument to measure those indicators. The study began with a review of the literature and standards developed by organizations focused on educational technology and distance education. Standards and research perceived to be dispositions for a successful online learner were included in a survey distributed to members of the *International Society for Technology in Education*, the *Association for Educational Communications and Technology*, and the *United States Distance Learning Association*. Over one-hundred online educators rated dispositional indicators. An open-ended question was also added for participants to provide dispositions not included. The survey was delivered a second time to have these additional dispositions rated. Online educators were then asked to engage in digital

card sorting to determine what behaviors might describe these dispositions. All data collection instruments were tested for ambiguity by graduate students and after all construct validity estimation was complete, dispositional indicators were aligned to behaviors to develop a psychometrically sound Dispositions of the Online Learner (DOL) instrument. The final DOL consisted of an eight-item validated scale of dispositions of the online learner. The goal of the DOL is that it will be used to track, monitor, and assess online learners' progress to ultimately improve performance.

INTRODUCTION

Why Assess Dispositions?

Possessing basic digital technology skills is not the only additional criteria an online learner needs to be successful. The *Association for Educational Communications and Technology* posits that: "Competency [is] a related set of knowledge, skills, abilities, *dispositions*, and other personal attributes, relevant to a task or targeted learning outcome," (Spector, Merrill, Allen, & Bishop, 2014). This study emerged at the request of educators. Authors of the Educational Disposition Assessment (Johnston, Wilson, & Almerico, 2018) instrument developed for pre-service teachers received feedback that an online dispositional assessment was also needed. Educators can address learning theories by applying various instructional design theories to engage learners in online environments (Yarbrough, 2018, Mendenhall, 2012; Myers & Reigeluth, 2016; Snyder, 2011). Creating the online delivery filled with rich content is the part of the equation the educator can impact. There is a consensus amongst educators who teach online, however, that there are certain dispositions that successful online learners also possess. Because dispositions have been addressed as a key component of learner competency and an instrument to measure these dispositions was requested by educators, this study focused on the following purpose. (a) Determine what dispositions an online learner should possess to maximize success; (b) evidence what those dispositions might look like with descriptive behaviors; and (c) create a psychometrically valid and reliable instrument to offer formative evaluation as a means to track, monitor, and assess online learners' progress to ultimately improve performance based upon appropriate indicators.

LITERATURE REVIEW

Constructing the Definition of the Online Learner Disposition

According to Johnston, Wilson, and Almerico:

> The importance of disposition assessment was stated by Borko, Liston, and Whitcomb (2007). They explain that dispositions are an individual's tendencies to act in a given manner and are predictive of patterns of action. (2018)

The mindset leading to these behavioral tendencies are based upon beliefs (Villegas, 2007). Therefore, certain dispositions may be necessary before the learner can act in a certain way to attain mastery of a skill. This literature review delves into research that has proceeded in trying to define what a disposition is and delineate dispositional indicators necessary to improve performance for the online learner. Although the literature addressing the term *dispositions* specific to assess the *online learner* is limited, the following sources were used to frame the definition of the term "disposition" specific to the successful online learner and support construct validity.

Dispositions of the Educator

To begin, the literature suggests that *educators* must possess more than internet and digital technology skills to be effective in the classroom (Kirwan & Roumell, 2015; Welch & Napoleon, 2015; Vannatta & Nancy, 2004; Armstrong & Thornton, 2012). Kirwan and Roumell offer a matrix of dispositions necessary for educators to effectively deliver and facilitate instruction in the online environment which includes: Openness to Experience/Intellect, Conscientiousness/Work Drive,

Agreeableness/Extraversion/Optimism (Kirwan & Roumell, 2015), Openness to Change, Self-efficacy (Vannatta & Nancy, 2004). A Community of Inquiry broken-down into nine other dispositions was also offered to foster success in asynchronous online courses including Hospitality, Participation, Mindfulness, Humility, Mutuality, Deliberation, Appreciation, Hope, and Autonomy (Armstrong & Thornton, 2012; Brookfield & Preskill, 1999). Kirwan & Roumell describe the *online educators'* dispositions as follows:

> People's behavior, generally speaking, is driven by their perceptions of the world. From a perceptual viewpoint, behaviors are considered corollaries of underlying personal values, beliefs, and perceptions of the world. Understanding an individual's general world perceptions provides insight into their observable behaviors (2015).

Dispositions of the Learner

Digging deeper into the literature, dispositions of the effective *learner* were examined next. Empirical studies have found the ELLI (Effective Lifelong Learning Inventory) instrument (Crick, Broadfoot, & Claxton, 2004) to be effective (Crick & Yu, 2008; Shum & Crick, 2012). The ELLI offers a list of dimensions focused on motivation, characteristics, and dispositions that lifelong learners self-identify. Shum and Crick define dispositions for a *learner* as:

> imprecise, both theoretically and in practice, it is widely agreed that it refers to a relatively enduring tendency to behave in a certain way (Katz, 1985). It is a construct linked to motivation, affect and valuing, as well as to cognitive resources (Dweck, 2013; Nicholls, 1984; Nicholls & Miller, 1983). Dispositions may be culture specific as well as a relatively enduring feature of personality. A disposition arises from desire, or motivation, which provides the energy necessary for action (Perkins, Jay, & Tishman, 1993; Perkins, Jay, & Tishman, 1993; Ritchhart & Perkins, 2000; Tishman, Jay, & Perkins, 1993).

The motivational, characteristic, and dispositional dimensions they identified as characteristic of an effective learner included: Changing and Learning, Critical Curiosity, Meaning Making, Dependence and Fragility, Creativity, Learning Relationships, and Strategic Awareness. Other literature also addressed the need for *digital learners* to possess 21st Century Skills (Spector, Merrill, Allen, & Bishop, 2014, p. 953).

Dispositions and Skills of the Online Learner

Honing into the literature focused on the *online learner* then, researchers located assessments designed to measure online readiness *skills* that were readily available (Searle & Waugh, 2013). This study posits that skills align to the psychomotor and cognitive domains. As aforementioned regarding educators and life-long learners, however, there is a certain mindset one must possess within the affective domain (Shum & Crick, 2012) to even begin embracing the learning process.

According to O'Byrne and McVerry (2009) who developed and piloted a survey to measure *online reading dispositions,* the following definition was offered: "Attitudes and beliefs that lead to patterns of behavior that promote gains in the acquisition of knowledge" (Putman, 2014). This instrument had users self-identify their perceptions of success in online reading based on the three domains inclusive of: cognitive/self-regulatory, behavior (i.e., skimming or reading), and affective (i.e., self-efficacy) factors (Putman, 2014).

Self-identified Online Learner Readiness

The final source that was found to most closely align to this study's purpose of assessing dispositions of the online learners (expanding beyond reading) was the OLRS (Online Learner Readiness Scale) instrument (Hung, Chou, Chen, & Own, 2010). This instrument offers learners the ability to self-identify dimensions for online success, similar to the online reading dispositions survey but, although addresses

that this may have relevance to learners' dispositions, uses readiness skills and attitudes as the primary nomenclature. Dimensions for the OLRS included: Computer/Internet self-efficacy, Self-directed learning, Learner control, Motivation for learning, and Online communication self-efficacy.

Dispositions are Evidenced by Behaviors

Lastly, although focused on the importance of the dispositions of the online educator, Welch and Napoleon posited:

> Dispositions are similar to professional beliefs or values systems, but they are more than that. One's dispositions are manifested in one's behavior. That behavior is how we quantify the disposition. The disposition is therefore an indicator of future action based upon that disposition (2015).

Thus, based on a compilation of how dispositions have been defined for *online educators, learners,* and *online readers* this study defined dispositions focused on the *online learner* as those attitudes stemming from the beliefs, values, and perceptions that predispose a learner to behave in ways that lead to learning gains and mastery of skills achieved in an online learning environment. For the purposes of this study, the latter will be referred to as performance improvement or *success.*

METHODOLOGY

The Goal

The goals of this study were as follows: (a) determine what dispositions an online learner should possess to maximize success, (b) evidence what those dispositions might look like with descriptive behaviors, and (c) create a psychometrically valid and reliable instrument to to offer formative evaluation as a means to track, monitor, and assess online learners' progress to ultimately improve performance.

To determine the dispositions of an online learner, researchers began by gathering standards already recognized in the field of instructional design, educational technology and distance learning organizations. Members of the research team included four professors; one had over fourteen-years' experience as an online educator (instructor and director) and six-years' experience as an online student, while the other three authored and developed the psychometrically sound Educational Disposition Assessment (EDA) (Almerico & Johnston, & Wilson 2011) instrument. The *United States Distance Learning Association* (USDLA) offers credentialing to standardize this process for educators. The *Association for Educational Communications and Technology* (AECT) offers standards to ensure sound design and pedagogy and the *International Society for Technology in Education* (ISTE) offers a range of standards for both students and educators. Researchers reviewed the standards to ascertain which ones, if any, could be considered dispositions and then compiled those with their respective qualifiers into a pre-investigative survey.

Next, a review of the literature on digital literacy, 21st Century Skills, netiquette, and social presence was explored to include any elements outside of the standards which online educators could possibly consider to be dispositions of online learners. The following were determined to be factors included in the pre-investigative survey to let the experts in the field determine if these were dispositions of the successful online learner.

- "Digital literacy: [is] the knowledge and abilities needed to search, locate, organize, analyze, evaluate, and synthesize information to communicate, manage, produce, and perform other tasks involving digital information and technologies," (Spector, J., Merrill, M. Allen, J. & Bishop, M. (Eds.), 2014).
- "21st century skills: [are] those skills believed necessary to contribute to workforce production and maintenance of a high quality of life in the twenty-first century, including skills related to creativity, collaboration, communication, critical thinking, information

literacy, media literacy, and technology literacy," (Spector, J., Merrill, M. Allen, J. & Bishop, M. (Eds.), 2014).

- Netiquette: is net etiquette demonstrating professional ethics and standards (O'Connor-Petruso, S., & Rosenfeld, B. 2009).

A final open-ended question was offered to gather any other factors the participants could identify based upon their experience.

To properly capture construct validity, it was important to focus on one domain to keep it pure. Thus, this phase allowed participants to differentiate the dispositions from the skills, affective domain from the cognitive and psychomotor domains. In other words, to differentiate between the cognitively learned behavior (skills) vs. attitudinally or emotionally based (dispositions). Some clearly apparent skills were intentionally included as outliers in the survey to support validating the instrument. An example and non-example of what an online disposition was also provided as an example within the instructions to increase clarity of instrument usage. This example and non-example was included in the survey for participants to rate as well given their expertise vs. relying on the researchers' perspectives. See Appendix A of First Pre-Investigative Survey.

Educators with experience in serving online learners were asked to select all options they felt were most representative of a disposition as opposed to a skill and when dispositions were determined, they determined behaviors which could evidence those. Data collection methods included the following.

Data Collection

I. Quantitatively, data rating the dispositions was collected using a Likert scale pre-investigative survey disseminated via the Qualtrics platform. Qualitatively, the open-ended question was offered to gather more dispositional indicators based on the experience of the participants. Calling upon the expertise of online educators, the survey was then distributed amongst members of the International Society for Technology in Education, the Association for Educational Communications and Technology, and the United States Distance Learning Association. The survey was created to take less than 10 minutes to complete individually in any setting, as it was offered online and, aside from the pilot, one administration of the survey was offered.

II. Based upon the data collected from the first survey administered, researchers examined the results and drew upon the Literature Review to gather any other factors that might be considered a disposition of an online learner. A second survey was then administered removing non-dispositions (as so determined by the expertise in the first survey) and including twelve more potential dispositional indicators to again be rated by the online educators.

III. After the results of the second survey were returned, the researchers compiled the final dispositions as determined by the expertise in the field. The next phase offered a mixed methods approach to invite participants to discuss and provide potential behaviors that might represent the dispositional indicators of the online learners. Behaviors were gathered from the participants in the initial survey and the Literature Review and blank cards were made available for participants to discuss and add others. Participants for this study were online educators in attendance at a Council for Accreditation of Educator Preparedness (CAEP) conference from which the EDA originated and original requests for this DOL instrument began. Thus, using a webbased card sort created in Qualtrics, participants were asked to drop and drag behaviors to the dispositional cards they determined to evidence. They were directed to drop and drag and order some, all, or none of the behaviors provided. They could also add their own behaviors as so determined and discussion was encouraged.

IV. A matrix was then created based upon the dispositions and representative behaviors collected. To strengthen construct validity, the researchers invited online instructors, known to the researchers to have over ten-years experience each, to review and provide any other representative behaviors not yet obtained.

V. Upon collection of those final behaviors, the researchers had online educators at the Academic and Business Research Institute (AABRI) International Conference rate them.

All instruments were piloted by Instructional Design and Technology graduate program students, professors, and/or online instructors and an IRB was prepared to adhere to ethical practices included in procedures of administering all data collection methods, including participants were all eighteen years of age or older. Researchers used standard practices of AERA (American Educational Research Association), APA (American Psychological Association) and in NCME (National Council on Measurement in Education) as addressed in *The Standards of Educational and Psychological Testing* (2013).

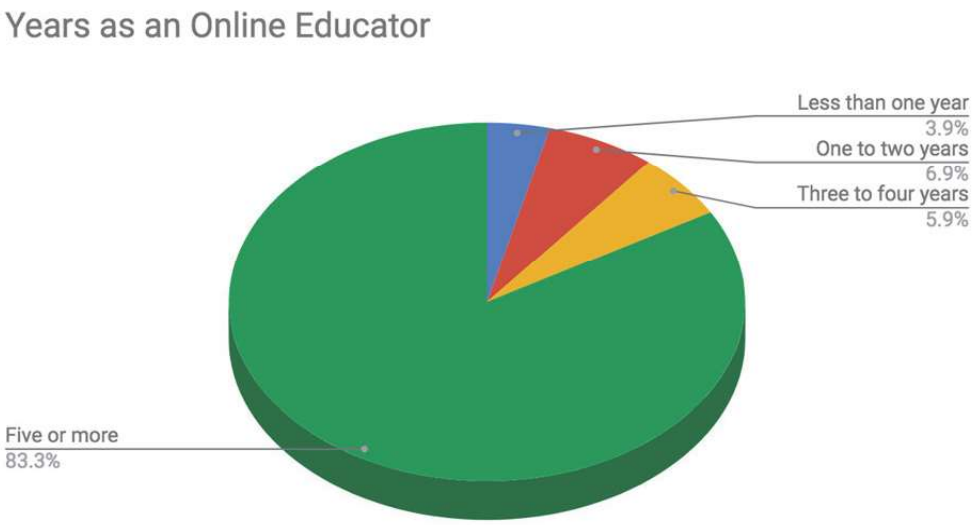
RESULTS

Determining the Dispositions of the Online Learner

First Pre-Investigative Survey to Collect and Rate Dispositional Indicators

One-hundred and four participants completed the initial survey sent to online educators to rate dispositions and collect any other dispositions to be included based upon their expertise. Close to ninety percent of those (91) had three or more years' experience, while seven had over a year to two years, and four had under a year (see Figure 1).

FIGURE 1
PARTICIPANTS' EXPERIENCE IN ONLINE EDUCATION



From those, most rated the survey as user-friendly to complete (see Table 1).

TABLE 1
USABILITY OF SURVEY

	Q25 - How user-friendly was survey to complete?					
#	Field	Minimum	Maximum	Mean	Std. Deviation	Variance
1	Stars = User-Friendly	1.00	5.00	4.11	1.06	1.13

Researchers examined the mean of each dispositional indicator and removed all averaging below 80% on a 100% rating scale. One standard (from ISTE), Digital Citizenship, was determined to be a disposition based upon the following two behaviors:

- Demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.
- Engage in positive, safe, legal and ethical behavior when using technology, including social interactions online or when using networked devices.

All other dispositional indicators averaging 80% and higher came from the literature. These included Self-starter, Competent with 21st Century Skills, and Demonstrates Netiquette. Thus, four dispositions in total were selected from the first round of data collection. First list of dispositions (selected from the standards and literature):

1. Digital Citizen (ISTE standard)
2. Self-starter
3. Competent with 21st Century Skills
4. Demonstrates Netiquette

The additional suggestions for dispositions provided by participants based upon their online experience were categorized and included in the second survey to validate these results. The online educators' input (for additional dispositional indicators and behaviors) was as follows:

- Risk taker. Comfortable with being uncomfortable
- Resilience when faced with challenging situations
- Curiosity, open to new ideas, willing to try new processes, self-reliant, helpful to others online
- We need to understand that Online learners desire to be individuals
- Desire to learn regardless of the medium. Demonstrate a willingness to engage with technology
- Initiative and advocacy
- Motivation, organization, and technology confidence
- Time management skills, understand demands of online learning
- Know the importance/need of working in groups
- Willingness to contact the teacher to ask questions

Researchers also compared all results to dispositions included in the EDA (Johnston, Wilson, & Almerico, 2018) and Educational Leadership (EDL) instruments (simultaneously being constructed) to include any other potential indicators not yet considered. Most were already accounted for but some were added as potential behaviors which were included in the next step of card-sorting by subject matter experts. One EDL disposition (Adaptable) that could potentially have merit for online learners was included in the second survey as a disposition as well. The second survey then distributed included all indicators as reflected on Table 2 to validate these results with a Likert scale.

TABLE 2
A COMPILATION OF DISPOSITIONS AND BEHAVIORS (AS OFFERED BY ONLINE EDUCATORS DURING FIRST SURVEY AND INCLUSIVE OF EDL AND EDA INSTRUMENT VIABLE INDICATORS AND RESEARCH AS CITED)

#	**Dispositions**	**Possible behaviors for the experts to determine which disposition it may match, if any**			
1	Risk-Taker				
2	Confidence	Comfortable with being uncomfortable.			
3	Resilience	Perseveres when faced with challenging situations.			
4	Curiosity	Displays desire to learn regardless of the medium.			
5	Openness	Demonstrates willingness to try new processes.	Willing to consider new ideas.		
6	Self-reliance				
7	Independent	Desires to be individual.			
8	Advocator for Self	Seeks out help and advocates for themselves so they don't disappear or remain unseen.	Willing to contact the teacher to ask questions.		
9	Self-motivated Learner				
10	Technology Confidence	Displays basic computer skills (i.e., taking a screenshot, adding an attachment to an email.)	Demonstrate a willingness to engage with technology.		
11	Time-Manager	Exhibits goal-oriented skills.	Adheres to demands of online learning.		
12	Collaborator	Helpful to others online.	Seek help when needed.		
13	Adaptable****				
		Demonstrates accountability for one's own behavior.***	Displays self-initiated motivational regulation skills, i.e. interest, goal orientations (Park & Lim, 2018).	Displays consi-stency.***	Demonstrates prepared-ness.***
		Displays commitment.***	Displays strong work ethic.***	Takes initiative.***	

Note: Factors with three asterisks were included from the EDA instrument while those with four asterisks were included from the EDL instrument.

Second Survey to Rate Dispositional Indicators

Online educator from the same organizations completed a second survey to rate dispositional indicators gathered through the first survey and factors included from other dispositional instruments. In agreement with the first survey results, most rated this survey as user-friendly to complete (see Table 3).

TABLE 3
USABILITY OF SURVEY

Q25 - How user-friendly was this survey to complete?							
#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Stars = User-Friendly	3.00	5.00	4.45	0.78	0.61	11

Feedback from a participant in the first survey drove a revision to the mechanics of the Qualtrics platform used for the second survey to replace the sliding scale question to a Likert scale question to provide greater accessibility to those with dexterity challenges. Researchers again examined the mean of each dispositional indicator and removed all averaging below 3 on a 4 point rating scale. Out of the thirteen, eight were rated as dispositions. These included: Resilience, Openness, Self-reliance, Independent, Self-motivated Learner, Advocator for Self, Technology Confidence, and Time Manager. These were then added to the four as determined by the first survey to come up with a list of twelve dispositional indicators for the online learner.

In accordance with data-analysis practices established (MacCallum, 1986), researchers then examined the results of the first and removed problematic items. For example, in consideration of further reflection and discussion, researchers determined that two of the behaviors initially describing 21st Century Skills (thinking critically and displaying information literacy) could only be considered cognitive functions and not dispositional and as such were removed. Likewise, Twenty-First Century Skills and Demonstrates Netiquette are by their definition "skills" and not dispositions. Time Manager could also be replaced by Self-Regulated Learning (SRL) (Driscoll, 2005; Hu & Driscoll, 2013; Putman, 2014; Pintrich, 1995; Garcia and Pintrich, 1994) represents this disposition whereby learners take control over their learning. Time manager is a behavior which evidences this disposition including scheduling and managing time effectively.

As a result, ten indicators remained as follows. Second round of dispositional indicators (gathered from standards, literature, dispositional instruments, online educators and rated by online educators):

1. Digital Citizen*
2. Self-starter
3. Resilience
4. Openness
5. Self-reliance
6. Independent
7. Advocator for Self
8. Self-motivated Learner
9. Technology Confidence
10. Time Manager / Self-regulated Learner

Note: *Asterisk represents: ISTE standard.

Determining Descriptive Behaviors to Evidence those Dispositions of the Online Learner

Next, a card sort was compiled for participants to group and rank the behavior statements which best represented the dispositions. This was delivered to a focus group of online educators at a CAEP conference workshop to determine behaviors which could be used to describe the dispositional indicators. Possible evidence provided by participants in the first survey as well as from other dispositional instruments (as noted on Table 4) were included (but not required) as potential behaviors for participants to select. Participants were also encouraged to discuss and add their own behaviors. Since the Digital Citizen indicator and its accompanying qualifiers had already been validated as a standard for ISTE, researchers determined to include it in the final instrument without further testing. The card sort required participants to drag behavior items into the aligned disposition to evidence further representation of the disposition (see Figure 2).

FIGURE 2
CARD SORT TO MATCH BEHAVIOR ITEMS WITH DISPOSITIONS

Behavior	Disposition Indicators
Items Adheres to demands of online learning. Advocates for themselves so they don't disappear or remain unseen. Comfortable with being uncomfortable. Demonstrate a willingness to engage with technology. Demonstrates a willingness to try new processes. Demonstrates accountability for one's own behavior. Demonstrates preparedness. Desires to be individual. Displays basic computer skills (i.e., taking a screenshot, adding an attachment to an email.) Displays consistency. Displays commitment. Displays desire to learn regardless of the medium. Displays self-initiated motivational skills (i.e. interest, goal orientations.) Displays strong work ethic. Exhibits goal-oriented skills.. Helpful to others online. Perseveres when faced with challenging situations. Seek help when needed. Takes initiative. Willing to consider new ideas. Willing to contact the teacher to ask questions. Type a behavior in the blank field to drop on a disposition	Advocator for Self Independent Openness Resilience Self-Motivated Learner Self-Reliance Self-Starter Technology Confidence Time-Manager

Results from the twenty-eight participants who participated in the card sort instrument are documented on Table 4.

TABLE 4
DISPOSITIONAL INDICATORS AND BEHAVIORS (FIRST ROUND)
AS DETERMINED BY ONLINE EDUCATORS

Disposition Indicator	**Behaviors**		
Time-Manager (Self-regulated, Driscoll, 2005)	Demonstrates preparedness.	Displays consistency.	Exhibits goal-oriented skills.
Technology Confidence	Demonstrate a willingness to engage with technology.	Displays basic computer skills (i.e., taking a screenshot, adding an attachment to an email.)	Helpful to others online.
Self-starter	Seeks help when needed.	Takes initiative.	Willing to contact the teacher to ask questions.
Resilience	Displays commitment.	Displays desire to learn regardless of the medium.	Perseveres when faced with challenging situations.
Openness	Comfortable with being uncomfortable.	Demonstrates a willingness to try new processes.	Willing to consider new ideas.
Self-motivated Learner	Displays self-initiated motivational skills; i.e. interest, goal orientations (Park & Lim, 2018.)		
Self-reliance	Displays strong work ethic.		
Independent	Desires to be individual.		
Advocator for Self	Advocates for themselves so they don't disappear or remain unseen.	Demonstrates accountability for one's own behavior.	

To strengthen construct validity further, three Subject Matter Experts (SMEs), online instructors known to the researchers to have over ten-years' experience each, were invited to review and provide any other representative behaviors not yet obtained. SMEs determined that Independent could be representative of Self-motivated Learner, Active Learner should be included, Self-motivated was synonymous with Self-reliance and should be merged, and added some behaviors as represented in Table 5. Researchers reviewed indicators one last time and cited with research supporting these dispositions.

TABLE 5
DISPOSITION INDICATORS AND BEHAVIOR REPRESENTATION (SECOND ROUND) VALIDATED BY SMES

Indicator	Behaviors		
Self-regulated, (Driscoll, 2005)	Demonstrates preparedness	Displays consistency	Displays strong work ethic
Technology Confidence	Demonstrates a willingness to engage with technology	Displays basic computer skills (i.e., taking a screenshot, adding an attachment to an email)	Helpful to others online. Effective digital communicator and collaborator. (Bandura, 1986)
Self-starter and Active Learner (Haverila, & Barkhi, 2009)	Takes interest and time to recognize where they are struggling. Independently searches for learning resources to address areas in need, and studies/learns beyond what is assigned	Takes initiative	Willing to contact the teacher to ask questions. (Seeks help when needed)
Resilience	Displays commitment	Displays desire to learn regardless of the medium	Perseveres when faced with challenging situations
Openness (Burt, Mackay, van der Heijden, & Verheijdt, 2017)	Comfortable with being uncomfortable	Demonstrates a willingness to try new processes	Willing to consider new ideas
Self-motivated Learner (synonymous with Self-reliance)	Displays self-initiated motivational skills (i.e. interest, goal orientations (Park & Lim, 2018.)	Possesses the ability to initiate and complete tasks or achieve goals **independent** of others' encouragement	Desires to be individual
Advocator for Self (Self-efficacy, Bandura, 1997)	Advocates for themselves so they don't disappear or remain unseen	Demonstrates accountability for one's own behavior	

Note: Additional behaviors by SMEs represented in red text.

The final round of construct validity was then offered to online educators at a research conference to rate the additional behaviors with one last Likert scale survey. On a scale of one to five, all were rated 3.5 or more so were deemed to be included in the final instrument.

Constructing the Psychometrically Valid and Reliable Instrument

Using the EDA instrument (Johnston, Wilson, & Almerico, 2018) as a template, the resulting dispositional indicators and behaviors were then incorporated into the Dispositions of the Online Learner

(DOL) instrument developed (see Table 6). The instrument went through beta-testing performed by Instructional Design and Technology graduate students to evaluate ambiguity and clarity.

TABLE 6
DISPOSITIONS OF THE ONLINE LEARNER MATRIX RUBRIC (FIRST DRAFT)

DOL Rubric			
Rate this learner's disposition:	**0-Needs Improvement**	**1-Developing**	**2-Meets Expectations**
Digital Citizen*	Most of the time, does not display these behaviors: ● Engage in positive, safe, legal and ethical behavior when using technology, including social interactions online or when using networked devices.* ● Demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.*	Some of the time, displays these behaviors: ● Engage in positive, safe, legal and ethical behavior when using technology, including social interactions online or when using networked devices.* ● Demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.*	Regularly, displays these behaviors: ● Engage in positive, safe, legal and ethical behavior when using technology, including social interactions online or when using networked devices.* ● Demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.*
Self-regulated	Most of the time, does not demonstrate preparedness, display consistency, or display strong work ethic.	Demonstrates preparedness, displays consistency, and displays strong work ethic some of the time.	Demonstrates preparedness, displays consistency, and displays strong work ethic most of the time.
Technology Confidence	Most of the time does not demonstrate preparedness and display consistency: ● Demonstrates a willingness to engage with technology. ● Displays basic computer skills (i.e., taking a screenshot, adding an attachment to an email). ● Helpful to others online. ● Effective digital communicator and collaborator.	Displays behaviors consistent with the following some of the time: ● Demonstrates a willingness to engage with technology. ● Displays basic computer skills (i.e., taking a screenshot, adding an attachment to an email) . ● Helpful to others online. ● Effective digital communicator and collaborator.	Typically displays behaviors consistent with the following: ● Demonstrates a willingness to engage with technology. ● Displays basic computer skills (i.e., taking a screenshot, adding an attachment to an email) . ● Helpful to others online. ● Effective digital communicator and collaborator.

DOL Rubric			
Rate this learner's disposition:	**0-Needs Improvement**	**1-Developing**	**2-Meets Expectations**
Self-starter and Active Learner	Rarely displays behaviors consistent with the following: ● Takes initiative. ● Takes interest and time to recognize where they are struggling. ● Independently searches for learning resources to address areas in need and studies/learns beyond what is assigned. ● Willing to contact the teacher to ask questions. (Seeks help when needed).	Sometimes displays behaviors consistent with the following: ● Takes initiative. ● Takes interest and time to recognize where they are struggling. ● Independently searches for learning resources to address areas in need and studies/learns beyond what is assigned. ● Willing to contact the teacher to ask questions. (Seeks help when needed).	Often displays behaviors consistent with the following: ● Takes initiative. ● Takes interest and time to recognize where they are struggling. ● Independently searches for learning resources to address areas in need and studies/learns beyond what is assigned. ● Willing to contact the teacher to ask questions. (Seeks help when needed).
Resilience	Typically, does not display the following behaviors: ● Commitment, desire to learn regardless of the medium or perseverance when faced with challenging situations.	Sometimes displays behaviors such as the following: ● Displays commitment. ● Displays desire to learn regardless of the medium. ● Perseveres when faced with challenging situations.	Consistently displays behaviors such as the following: ● Displays commitment. ● Displays desire to learn regardless of the medium. ● Perseveres when faced with challenging situations.
Openness	Does not typically demonstrate behaviors such as the following: ● Comfortable with being uncomfortable or demonstrating a willingness to try new processes or consider new ideas.	Sometimes demonstrates behaviors such as the following: ● Comfortable with being uncomfortable. ● Demonstrates a willingness to try new processes. ● Willing to consider new ideas.	Regularly demonstrates behaviors such as the following: ● Comfortable with being uncomfortable. ● Demonstrates a willingness to try new processes. ● Willing to consider new ideas.

DOL Rubric			
Rate this learner's disposition:	**0-Needs Improvement**	**1-Developing**	**2-Meets Expectations**
Self-motivated Learner (synonymous with Self-reliance)	Rarely exhibits behaviors such as the following: ● Displays self-initiated motivational skills (i.e. interest, goal orientations). ● Initiates and completes tasks or achieves goals independent of others' encouragement. ● Desires to be individual.	Sometimes exhibits behaviors such as the following: ● Displays self-initiated motivational skills (i.e. interest, goal orientations). ● Initiates and completes tasks or achieves goals independent of others' encouragement. ● Desires to be individual.	Often exhibits behaviors such as the following: ● Displays self-initiated motivational skills (i.e. interest, goal orientations). ● Initiates and completes tasks or achieves goals independent of others' encouragement. ● Desires to be individual.
Advocator for Self	Rarely: ● Advocates for themselves so they don't disappear or remain unseen and ● Demonstrates accountability for one's own behavior.	Sometimes demonstrates the following: ● Advocates for themselves so they don't disappear or remain unseen and ● Demonstrates accountability for one's own behavior.	Typically, demonstrates the following: ● Advocates for themselves so they don't disappear or remain unseen and ● Demonstrates accountability for one's own behavior.
Please add anything to further support your ratings of this learner's dispositions.			

*Asterisk represents ISTE standard and qualifiers.

DOL Ambiguity Testing

Instructional Design & Technology graduate students (n=24) were given the rubric to evaluate clarity of the instrument. These students from two sections of an Inquiry and Measurement course were directed to evaluate the overall directions and every question of this DOL Rubric instrument. Questions used to rate the rubric were from *The Checklist to Evaluate the Quality of Questions* Question Appraisal System (QAS-99) (Department of Health and Human Services, 2008). Open-ended questions were also provided for test conductors to provide details for each of the ratings.

During the data screening process, researchers examined results and removed any outliers that strayed from the purpose of the validity testing of the rubric. For example, the rubric was administered through the Qualtrics platform which had limited formatting ability that conductors noted could be improved upon. All data was then organized and tallied to compare the results scoring "difficult (1)" with those scoring "acceptable (2)" and "well-developed (3)".

The first theme to arise was that the clarity of the questions seemed to improve with each question. The administrator observed that the test conductors became more familiar with the layout as the test progressed, improving their clarity. Researchers then analyzed the qualitative feedback categorizing two main themes including keeping qualifiers the same for each question and revising the context of each question to improve clarity. Thus, the instrument was reformatted into a Likert scale where all qualifiers

could be kept to offer consistency (rarely, sometimes, regularly) and simplify the process so instructors would need to read the behavior only once for each disposition indicator for clarity.

DISCUSSION AND CONCLUSION

Evidences of Validity

Researchers observed that the final DOL instrument provides evidence of construct validity. This evidence better assures that the dispositions identified are trustworthy measures. The "active learner" addition determined by one of the SME's was also supported and founded in the literature as per Haverila & Barkhi to increase learner effectiveness (2009). Likewise, each subsequent disposition was able to be supported with the literature (as cited in Table 8).

Additional evidence of validity is provided in the alignment of items with the five dimensions (factors) that the OLRS verified with a confirmatory factor analysis of readiness skills. The researchers found that those five factors which learners self-identify for online readiness, are nested within the eight dispositions in the DOL instrument as determined by this study to be rated by instructors. This convergent validity is reflected in Table 7. Both scales measure related constructs from different perspectives. The OLRS measures from the students' perspectives and might be a good alignment to offer to students prior to enrolling in online courses while the DOL is measured from the instructor perspective during online courses.

TABLE 7
CONVERGENT VALIDITY BETWEEN THE OLRS AND THE DOL

DOL (INSTRUCTOR IDENTIFIED DISPOSITIONS)	**OLRS (Haverila & Barkhi, 2009) (LEARNER SELF-IDENTIFIED READINESS SKILLS)**
Digital Citizen (ISTE standard)	
Self-regulated *Driscoll, 2005)	**Learner control -** setup a schedule- "centered on online learners' control over their learning (control that manifested itself as repeating or skipping some content) and on efforts by online learners to direct their own learning with maximum freedom (Merrill, Reigeluth, & Stein, 1983)" (Haverila & Barkhi, 2009).
Technology Confidence	**Computer & Internet self-efficacy**
Self-starter and Active Learner (Haverila & Barkhi, 2009)	**Motivation for learning-**active learner-"centers on online learners' learning attitudes" (Haverila & Barkhi, 2009).
Resilience	
Openness	**Online communication self-efficacy -** Bandura, 1986: "which would describe learners' adaptability to the online setting through questioning, responding, commenting, and discussing" (Haverila & Barkhi, 2009).
Self-motivated Learner (Self-reliance)	**Self-directed learning (SDL)-** As related to goals and **se**lf-management: "centered on learners' taking responsibility for the learning context to reach their learning objectives described by Garrison (1997)" (Haverila & Barkhi, 2009).
Advocator for Self (Self-efficacy, Bandura, 1997)	

Researchers do acknowledge that there may be overlap in the DOL dispositions but chose to provide all eight dispositions for instructors to rate in order to ensure consistency and reliability.

Evidence of valid, trustworthy results based on a collective group of experts supported the development of this Dispositions of the Online Learner (DOL) instrument. It is not intended to deny anyone from an online program but, instead, to support performance improvement. It is suggested that this instrument may be used as a guide to begin the process of improving dispositions in order to maximize performance online. It may provide to be a compliment to the OLRS as students could self-identify with that survey to assure the online environment is the correct fit for them before they even begin online classes. The final DOL consisted of a eight item validated scale of dispositions of the online learner to provide instructors with a psychometrically valid and reliable instrument to to offer formative evaluation as a means to track, monitor, and assess online learners' progress to ultimately improve performance. The goal of the DOL is that it will be used to track, monitor, and assess online learners' progress to ultimately improve performance.

FUTURE STUDY

Inter-rater Reliability Estimation

The final phase of testing this instrument will be conducted to 1) have diverse professors test gender and ethnicity bias, 2) have students measure themselves over the course of a few weeks with the instrument to test for intra-rater reliability and 3) have professors measure students with the instrument to ensure inter-rater reliability. It is intended for future studies to have professors use the instrument when delivering instruction online when they award final grades. In this manner, researchers may examine the results for correlation based upon grade achievement (performance success) and dispositions as well as inter-rater reliability amongst professors across classes. Researchers determined the instrument should be tested in the field to authenticate usability before proceeding with the latter.

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APPENDIX A

Data Collection First Pre-Survey Instrument to Gather Dispositions

Consent to Inform

Dear Participant,

The purpose of this research is to: 1) Determine what dispositions an online learner should possess. This survey should take you no longer than 10-15 minutes to complete.

If you do not want to be in this study, then you do not have to be. This study is voluntary, which means that you decide whether or not to take part in it. Being in this study is up to you. No one will be upset in any way if you do not want to participate. You can even change your mind later if you want to stop.

Your information will be safe. It will not be in any writings about the study. For example, your name or social security number will not be shown anywhere.

You may ask any questions about the study by emailing us here: sensmann@ut.edu or the University of Tampa International Review Board, irb@ut.edu should there be further questions or should you experience undesirable consequences from participating.

Selecting the submit button means that you agree to participate in this study. Would you like to be part of this study?

Kind regards,

Dr. Suzanne Ensmann

Assistant Professor

Education Department, ID&T Program

University of Tampa

If you have any questions about this survey, please contact the PI: Suzanne Ensmann, Ed.D, Assistant Professor, University of Tampa, sensmann@ut.edu or the University of Tampa International Review Board, irb@ut.edu.

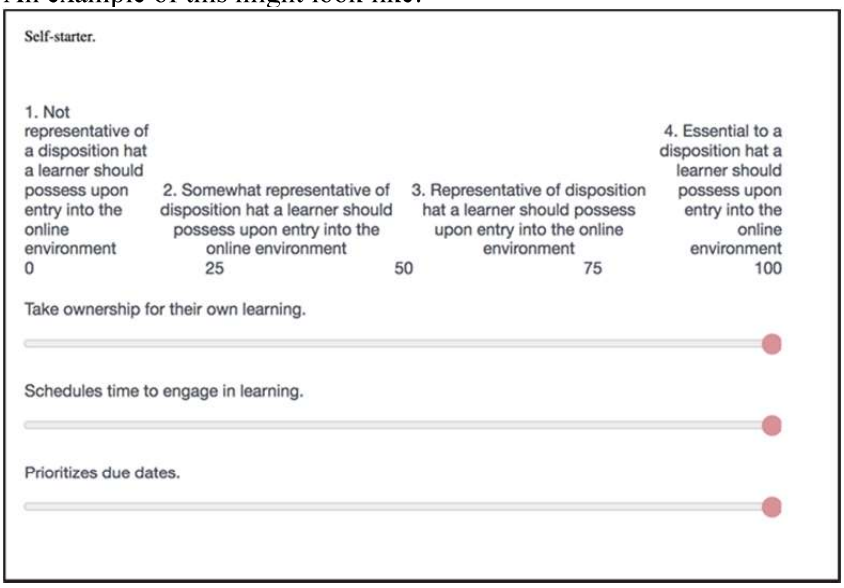
If you qualify and agree to these terms, please proceed and answer the questions to the best of your ability. Please select the best answer respective to your use or preferences with these technologies.

Instructions:

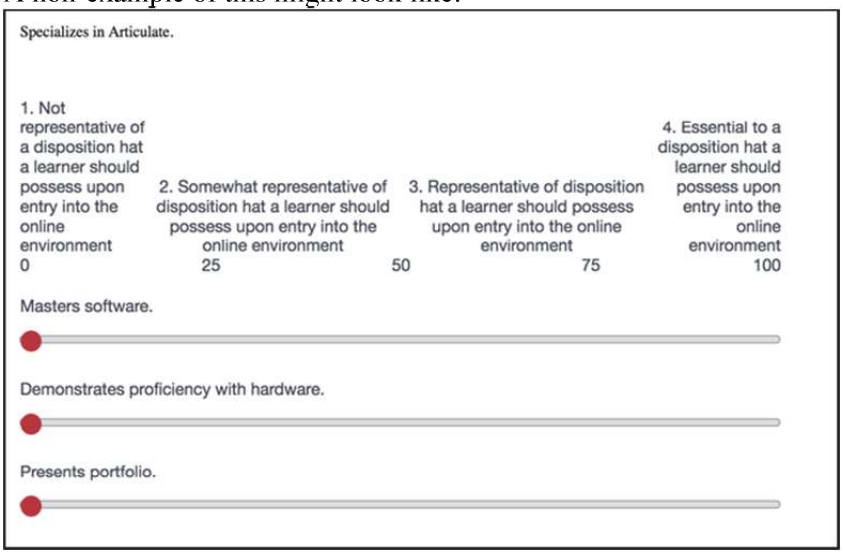
For this study, dispositions will be defined as **those attitudes stemming from the beliefs, values, and perceptions that predispose a learner to behave in ways that lead to learning gains and mastery of skills achieved in an online learning environment.**

Given your experience with online learners and the online learning environment, on a scale of 0 to 100%, you will be asked to rate the standard indicators you believe qualify as a disposition that a learner should possess upon entry into the online environment to increase their odds of successful learning outcomes.

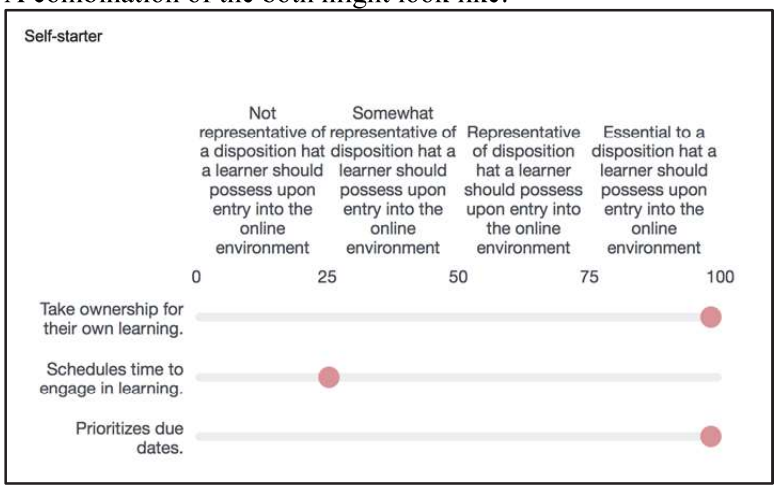
An example of this might look like:



A non-example of this might look like:



A combination of the both might look like:



Items with asterisks were taken from standards respectively (*ISTE Standards **AECT Standards).

Now, your turn. Rate the following:

1. **Empowered Learner***

Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences. Students:

- ❏ Articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes.
- ❏ Build networks and customize their learning environments in ways that support the learning process.
- ❏ Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.

2. **Digital Citizen***

Students recognize the rights, responsibilities and opportunities of living, learning and working in an interconnected digital world, and they act and model in ways that are safe, legal and ethical. Students:

- ❏ Cultivate and manage their digital identity and reputation and are aware of the permanence of their actions in the digital world.
- ❏ Engage in positive, safe, legal and ethical behavior when using technology, including social interactions online or when using networked devices.
- ❏ Demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.
- ❏ Manage their personal data to maintain digital privacy and security and are aware of data collection technology used to track their navigation online.
- ❏ Understand the fundamental concepts of technology operations, demonstrate the ability to choose, use and troubleshoot current technologies and are able to transfer their knowledge to explore emerging technologies.

3. **Knowledge Constructor***

Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others. Students:

- ❏ Plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.
- ❏ Evaluate the accuracy, perspective, credibility and relevance of information, media, data or other resources.
- ❏ Curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.

- ❑ Build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

4. Innovative Designer*

Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions. Students:

- ❑ Know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
- ❑ Select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.
- ❑ Develop, test and refine prototypes as part of a cyclical design process.
- ❑ Exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.

5. Computational Thinker*

Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions. Students:

- ❑ Formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.
- ❑ Collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.
- ❑ Break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.
- ❑ Understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

6. Creative Communicator*

Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals. Students:

- ❑ Choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.
- ❑ Create original works or responsibly repurpose or remix digital resources into new creations.
- ❑ Communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.
- ❑ Publish or present content that customizes the message and medium for their intended audiences.

7. Global Collaborator*

Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally. Students:

- ❑ Use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning.
- ❑ Use collaborative technologies to work with others, including peers, experts or community members, to examine issues and problems from multiple viewpoints.
- ❑ Contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.
- ❑ Explore local and global issues and use collaborative technologies to work with others to investigate solutions.

8. Learning Environments**

Candidates facilitate learning by creating, using, evaluating, and managing effective learning environments. (p. 1, 41). Indicators:

- ❑ Creating - Candidates create instructional design products based on learning principles and research-based best practices. (pp. 8, 243-245, 246)
- ❑ Using - Candidates make professionally sound decisions in selecting appropriate processes and resources to provide optimal conditions for learning based on principles, theories, and effective practices. (pp. 8-9, 122, 168-169, 246)

- ❑ Assessing/Evaluating - Candidates use multiple assessment strategies to collect data for informing decisions to improve instructional practice, learner outcomes, and the learning environment. (pp. 5-6, 53)
- ❑ Managing - Candidates establish mechanisms for maintaining the technology infrastructure to improve learning and performance. (p. 190, 234, 238)
- ❑ Ethics - Candidates foster a learning environment in which ethics guide practice that promotes health, safety, best practice, and respect for copyright, Fair Use, and appropriate open access to resources. (p. 3, 246)
- ❑ Diversity of Learners - Candidates foster a learning community that empowers learners with diverse backgrounds, characteristics, and abilities. (p. 10)

9. Professional Knowledge and Skills**

Candidates design, develop, implement, and evaluate technology-rich learning environments within a supportive community of practice. Indicators:

- ❑ Collaborative Practice - Candidates collaborate with their peers and subject matter experts to analyze learners, develop and design instruction, and evaluate its impact on learners.
- ❑ Leadership - Candidates lead their peers in designing and implementing technology-supported learning.
- ❑ Reflection on Practice - Candidates analyze and interpret data and artifacts and reflect on the effectiveness of the design, development and implementation of technology-supported instruction and learning to enhance their professional growth.
- ❑ Assessing/Evaluating - Candidates design and implement assessment and evaluation plans that align with learning goals and instructional activities.
- ❑ Ethics - Candidates demonstrate ethical behavior within the applicable cultural context during all aspects of their work and with respect for the diversity of learners in each setting.

10. Digital Literacy Learners:

- ❑ Search, and locate information to communicate, manage, produce, and perform other tasks involving digital information and technologies.
- ❑ Organize information to communicate, manage, produce, and perform other tasks involving digital information and technologies.
- ❑ Analyze information to communicate, manage, produce, and perform other tasks involving digital information and technologies.
- ❑ Evaluate, information to communicate, manage, produce, and perform other tasks involving digital information and technologies.
- ❑ Synthesize information to communicate, manage, produce, and perform other tasks involving digital information and technologies.

11. 21st Century Skills Learners:

- ❑ Collaborate
- ❑ Communicate
- ❑ Think critically
- ❑ Display information literacy
- ❑ Display media literacy
- ❑ Display technology literacy

12. Netiquette

Learners demonstrate:

- ❑ Professional ethics
- ❑ Professional standards

13. **Please list any other dispositions you feel should be included.**

14. **Demographics**

- With which gender do you identify?
  o Male (1)
  o Female (2)
  o Please list other (3)
- Please specify your ethnicity/race.
  - Asian / Pacific Islander.
  - Black or African American.
  - Hispanic or Latino.
  - Native American or American Indian.
  - Two or more races.
  - White
  - Please list other
- Select years of experiences taking online classes.
  - Less than one year
  - One to two years
  - Three to four years
  - Five or more

Thank you for participating.

As previously stated, the purpose of this research is to: 1) Determine what dispositions an online learner should possess. The results will be available by the PI in the fall of 2018.

You may contact the Suzanne Ensmann, Assistant Professor, University of Tampa, sensmann@ut.edu, or the University of Tampa International Review Board, irb@ut.edu should there be further questions or should you experience undesirable consequences from participating.