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Assessing K-12 Online Teachers' Knowledge of Online Student Identities

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Additional research is needed to acknowledge the increase in diversity of K-12 online learners. This study explores K-12 online teachers' perceived knowledge of the identities that may be present in their students and their perceived ability to meet the needs of these students. Using the MAKSS-T instrument which is designed to measure an individual's multicultural awareness, knowledge, and skills, this study researched why K-12 online teachers felt they have a "good" understanding of the possible identities of their students and addressing their needs. However teachers state they are not confident in their understanding of gender and affectional orientation. Teachers noted that they did not feel adequately prepared to meet the needs of diverse online students and desired additional training in this area.

Keywords: online teaching, student identities, teacher self-efficacy, K-12 education

ASSESSING K-12 ONLINE TEACHERS KNOWLEDGE OF ONLINE STUDENT IDENTITIES AND CHARACTERISTICS

K-12 online learning continues to grow with millions of students nationwide enrolled in online coursework. Growth in K-12 online learning is no longer isolated to supplemental courses for advanced students, but now includes courses for credit recovery and graduation, greatly expanding the population of K-12 online students (Barbour & Unger, 2014; Freidhoff, 2018; Gemin, Pape, Vashaw, & Watson, 2015). Little demographic information has been collected on the K-12 online population in the United States (Gemin et al., 2015), unlike face-to-face teaching where schools are encouraged to develop inclusive classroom practices (NEA), online classrooms are behind in acknowledging diversity. The National Center for Education Statistics (2019) reports that in all areas of instruction the percentage of white students has decreased from 61% to 49%. Additionally, the Centers for Disease Control (CDC) (2017) reports that approximately 8% of public school students identify as lesbian, gay, bisexual, queer, or transgender (LGBQT). With over 53% of all public schools participating in online education (NCES, 2019), the demographics of K-12 online is changing (Beck & LaFrance, 2017).

Diverse students necessitate diverse teaching methods, as studies indicated that student identity can affect student learning (Altugan, 2015; Berry & Candis, 2013; Corbett, 2015; Dean & Jolly, 2012; Ligorio, 2010; Yeboah & Smith, 2016). Dean and Jolly (2012) defined identity as the "concept of 'self" in a social context," (p.233) or identity can be viewed as how a student sees them self in the world (Corbett, 2015). Identity cannot only be how a student perceives oneself in an immediate social context, but in a social network beyond immediate connections (i.e., online social settings). Altugan (2015) contended that identity is a combination of both nature and nurture with students' lived experiences forming who they perceive themselves to be as a person. Students may have multiple identities (Harper, Serrano, Bruce & Bauermeister, 2016), in terms of culture (Altugan, 2015), race (Yeboah & Smith, 2016), gender (Corbett, 2015) or sexual orientation (Harper, Serrano, Bruce & Bauermeister, 2016).

Research examining the effects of student identity on learning has been ongoing (Altugan, 2015; Berry & Candis, 2013), in response to an increasingly diverse population, taught by predominantly white women (Berry & Candis, 2013). NCES (2019) data shows that during the 2015-2016 academic year 7% of US K-12 teachers were Black, 9% Hispanic, while 80% were White. Pritchett (2011) contends that white teachers in the United States view the world through a "monolithic cultural gaze" (p. 61) which can impact interactions with students of different identities. Ladson-Billings

(2013) argues that it is likely for students of color to complete their public education without having a teacher who shares their racial or cultural identity.

Student identity has been tied to motivation and engagement, both of which are important factors in student learning (Altugan, 2015; Damary, Markova, & Pryadilina, 2017; Dean & Jolly, 2012; Ligorio, 2010). According to Ligorio (2010) "... knowledge is actively built in and through the sense-making process concerning all the events and facts people are exposed to" (p. 94), making student identity and learning inextricably connected. Altugan (2015) notes that students who are able to share and embrace their identity in class are able to build trust with teachers, thereby increasing engagement. Dean and Jolly (2012) argue that a lack of recognition of student identities in a learning environment can lead to disengagement with course material, the teacher and classmates.

Technology has been heralded as the great equalizer in education (Hannon & D'Netto, 2007; Philip & Garcia, 2013; Schilmoeller, Griswold & Strudler, 2018). Proponents of online education contend that more and better online courses create greater learning opportunities for more students (Kennedy & Ferdig, 2018) and consequently, greater opportunities for more diverse students. However, critics argue that teachers may lack the knowledge and skills to meet the needs of these diverse students in an online environment (Damary, Markova, & Pryadilina, 2017; Lowrie & Jorgensen, 2012; Yeboah & Smith, 2016). The current study sought to explore the perceived knowledge of K-12 online teachers in terms of student identities, and their perceived skills in addressing the needs of these students using the Multicultural Awareness Knowledge and Skills Survey Teacher Form (MAKSS-T; D'Andrea, Daniels & Noonan, 2003), which was chosen because of its high level of reliability and connection to teacher's perceptions of student identities

REVIEW OF LITERATURE

Considerations of racial, ethnic, and cultural diversity in online education are especially important given the changing demographics of online learners (Gemin, et al., 2015; NCES, 2019). Historically, African-Americans and Latinos have had limited access to computers and the internet, developing considerably different computer usage habits than their Caucasian peers (Philip & Garcia, 2013). Yeboah and Smith (2016) noted that minority students are more likely to utilize technology for social media or gaming rather than education.

Cultural identity can also impact more than how students access technology (Damary, Markova & Pryadilina, 2016; Hannon & D'Netto, 2007; Kegel & Bus, 2012; Kim, 2012; Liao & Chou, 2012; Suppes, Liang, Macken and Flickinger, 2014; Tapanes, Smith & White, 2009; Yeboah & Smith, 2016). Research has suggested that not only does the instructor's cultural knowledge matter in terms of student satisfaction in an online course (Damary, Markova & Pryadilina, 2016; Hannon & D'Netto, 2007; Tapanes, Smith & White, 2009; Yeboah & Smith, 2016) but that considerations of cultural differences and student identities affected overall course outcomes, in particular student achievement and participation (Damary, Markova & Pryadilina, 2016; Hannon & D'Netto, 2007; Kim, 2012; Liao & Chou, 2012; Suppes, Liang, Macken and Flickinger, 2014; Kegel & Bus, 2012).

Tapanes, Smith, and White (2009) explored whether collectivist learners, those that come from a culture in which the group has higher value than that of the individual, felt as if their online instructors had a clear understanding of their cultural background and how culture impacted their learning in an online course. They found most students surveyed did not feel their culture, and, as a result, their specific communication methods were taken into consideration in the development of the learning community, and these students did not participate in ways expected by their instructor. Damary, Markova, and Pryadilina (2016) added that students who are accustomed to a more teacher-centered culture struggled to adjust to the standards of participation of the student-centered structure of online learning and that these students may avoid seeking help when confused.

Online courses have historically been designed to place greater value on the language and customs of the English speaking world (Hannon & D'Netto, 2007; Kim, 2012; Tapanes, Smith & White, 2009; Yeboah & Smith, 2016). Hannon and D'Netto (2007) argued that online courses are designed to emphasize the importance of English language, customs and conventions in both course design and student participation. Kim (2012) also argued that many online courses place high value on a student's English fluency, a factor that impacted student success in research by Yeboah and Smith (2016). Lewthwaite, Knight and Lenoy (2015) explored the impact of cultural considerations in an online program preparing preservice teachers from Aboriginal communities. They found that while instructors did make cultural considerations within synchronous communications, the asynchronous components of the course remained in what are considered cultural "norms" for the English speaking world, causing confusion among students.

Research examining gender and sexual orientation identities also demonstrated the impact of these identities on student learning and online interaction (Kennedy & Ferdig, 2018). Gender identity has been shown to have

an impact on students' perceived ability in science and mathematics (Corbett, 2015). Hwang (2010) found that when participating in online courses, persons who identified as male are more concerned with their self-identities whereas those who identified as female are more concerned with their social identities within the course, impacting how students interacted with course material, their instructor and their peers. Corbett (2015) argued the importance of belonging in a social space, such as a discussion forum, in order to fully engage with course material, noting that women may not feel as welcome in science or math classes, and therefore withdraw from discussion. Gender identity can also intersect with culture, as noted by Rind and Gritte (2015). In their study, female Pakistani students in an online course demonstrated limited interactions with their instructors and peers, falling into the more submissive gender roles dictated by their culture, leading to reduced participation in discussions within the course. Hwang (2010) also noted that female students place a greater value on their social identity thereby affecting their participation in online coursework.

Emerging research on the impact of sexual orientation identity on learning suggested sexual orientation can indeed impact both learning and technology use (Fox & Ralston, 2016; Harper et al., 2016; Lozano-Verduzco & Rosales Mendoza, 2016; Rind & Gritter, 2015). Fox and Ralston (2016) noted that LGBQT students often avoid groups where they do not feel their identity is accepted, which could lead to decreased engagement in the online classroom. Further, LGBQT students often utilized the internet and computing technology for research as they continued to define their identities (Harper et al., 2016), giving them an advantage over their peers in online social networking and technology skills (Fox & Ralston, 2016). Sexual orientation identity can also affect participation in educational settings due to social bias against a queer lifestyle (Lozano-Verduzco & Mendoza, 2016). In a 2016 study, Lozano-Verduzco and Mendoza discovered homosexual males find their identities to have a negative impact on their learning environment and would not participate as readily in a face-to-face setting as they would online. Therefore, while research in this area is still limited, it does suggest possible impacts of these identities on student learning and course participation.

With the demonstrated impact of student identity on learning, it is important that all teachers are equipped to meet the needs of all students. In shaping the online classroom, a teacher must be aware of the possible presence of these identities in order to ensure that these students are both included and feel welcome to maximize student engagement (Corbett, 2015; Fox & Ralston, 2016; Hwang, 2010).

Additionally, Yeboah and Smith (2016) conducted a study of minority students to see how their identities may have affected, not only their satisfaction in the course (which they claim has been studied previously), but also their academic performance. They found students' self-perception had a statistically significant impact on their performance. The authors concluded that, in order for teachers to obtain the maximum performance from their students, important considerations of identity and belonging had to be integrated in the overall class structure and interaction (Corbett, 2015; Ladsen-Billings, 2013; Yeboah & Smith, 2016). The importance of student identity guided the initial research questions:

- *Research Question 1a:* What is the distribution and central tendency of online teacher self-perceived knowledge of online student identities/characteristics in the field of online learning?
- *Research Question 1b*: What is the distribution and central tendency of online teacher self-perceived skills in addressing the needs of their diverse online students in the field of online learning?

Additionally, research in online teaching demonstrated that various mitigating factors can impact teachers' overall pedagogical attitude when it comes to online learning (Lloyd, Byrne & McCoy, 2012; Holly, Legg, Mueller & Adelman, 2008; Horvitz, Beach, Anderson & Xia, 2014; Jackson, 2019). Such factors can include academic area (Holly, Legg, Mueller & Adleman, 2008; Horvitz, Beach, Anderson & Xia, 2014; Jackson, 2019), and personal attributes including gender identification, age, grade-level taught and years of experience (Lloyd, Byrne & McCoy, 2012; Jackson, 2019). To determine if these factors would impact an online teacher's ability to understand and meet the specific needs of student identities in the online classroom, the following additional research questions were developed:

- *Research Question 2a:* What is the relationship between academic field and the level of online teacher self-perceived knowledge of online student identities/characteristics in the field of online learning?
- *Research Question 2b:* What is the relationship between academic field and the level of online teacher self-perceived skills in addressing the needs of their diverse online students in the field of online learning?
- *Research Question 3a:* Is the relationship between academic field and the level online teacher self-perceived knowledge of online student identities/characteristics in the field of online learning moderated by teacher gender, age, grade level taught, total years of teaching experience or years of experience teaching online?

• *Research Question 3b*: Is the relationship between academic field and the level online teacher self-perceived skills in addressing the needs of their diverse online students in the field of online learning moderated by teacher gender, age, grade level taught, total years of teaching experience or years of experience teaching online?

METHODS

A quantitative non-experimental survey design was chosen for this study. Given the need for understanding the perceptions of online K-12 teachers in regards to student identities (Mitchell & Jolley, 2012), this research design allowed teachers to offer authentic feedback without the possible bias of experimental or control grouping. Furthermore, since participants were not and could not be randomly assigned to teaching online classrooms, and the researchers are concerned about capturing teachers' perceptions of student identities it was determined that a quantitative non-experimental design, would be best suited to answer the research questions.

Participants

Study participants were recruited by both convenience and snowball sampling (Goodman, 1961). Initial participants were chosen from a pool of volunteers with professional connections to the researchers which provided a master list for distribution of the survey. Volunteers were encouraged to share the survey with other possible participants. Participants (n=125) were restricted to public and private K-12 teachers that teach at least one course completely online in the United States. K-12 teachers from all grade levels and subject areas were sought for participation in the study. The survey was viewed by 782 prospective participants. Of these views, 156 began the survey measure with 125 completed it. Participant demographics demonstrate that the majority of survey respondents were female (90%) and taught high school courses online (82%), a minority (18%) taught middle or elementary school. Most reported to be over 30 years of age (89%) with 50% reporting 16 or more years of teaching experience, and 61% of survey respondents had 5 years or less of online teaching experience. The following table shows the total number of participants (n=125) distributed by their academic field to highlight the difference between participants.

Table 1
Participants by Academic Field

Academic Field	N
Math	38
World Language	37
Multiple Subjects Taught online	12
Art	2
P.E.	4
Science	11
K5	3
Social Studies	16
Language Arts	31
Career & Technical Education	13
Music	2
Computer Science	3

Instrumentation

The Multicultural Awareness Knowledge and Skills Survey Teacher Form (MAKSS-T; D'Andrea, Daniels & Noonan, 2003) was utilized in this study. MAKSS-T was developed as a method to evaluate a teacher's perceived effectiveness in meeting the needs of students of diverse backgrounds. The instrument was chosen due to its focus on a number of student identities (Clark, 2010) and its high levels of reliability, with each of the subscales A, B and C having alphas of .73, .86 and .93, respectively (D'Andrea, Daniels & Noonan, 2003). The original measure consists of 51 items and three subscales, all scored on a Likert-type scale utilizing the following range: Very Limited (1), Limited (2), Good (3) & Very Good (4). The wording implemented in this scale was selected by survey creators to represent teacher self-efficacy in terms of their awareness (Subsection A), knowledge (Subsection B) and skills (Subsection C) (D'Andrea, Daniels & Noonan, 2003).

Subsection A, the Multicultural Awareness Subscale, was eliminated from the survey as it was not possible to frame the questions to the field of online learning without affecting the reliability coefficient. The instrument utilized in this study, therefore, consisted of the final two subscales from

the original measure: Subscale B: the Multicultural Knowledge Scale and Subscale C: the Multicultural Skills Scale, along with supplementary demographic items and additional questions created by the researcher. Additional questions referred to other possible online student identities based on the available literature in online student characteristics for success. The inclusion of these questions was to balance the effects of the questions that focused on multi-cultural characteristics, gender and sexual orientation identities in an effort to avoid participant bias. As the content of these questions is not the focus of this study and inclusion of these questions would affect the alpha coefficients, these questions were not factored into the data analysis. The measure in its final form consisted of fifty items.

Reliability of the Measure

In order to ensure reliability, an analysis was completed to obtain an alpha reliability coefficient for the two subscales B, for knowledge, and C, for skills. Analysis in STATA following the collection of this data found both subscales B and C to have an alpha of .95, demonstrating the adapted measure to have high reliability (D'Andrea, Daniels & Noonan, 2003).

Data Collection

Surveys were sent via email. Participants were advised that the survey would remain open for two weeks. A period of two weeks was chosen to allow the researchers additional time to evaluate whether more responses were needed. After the close of the collection period, descriptive statistics were run to determine if the total number of responses totaled at least 100 respondents. At the close of the survey period, 125 surveys were completed.

Data Analysis

Prior to analysis, missing data was analyzed on the survey sample. Little's MCAR test (Little, 1988) was conducted to assess whether the missing data was Missing Completely At Random (MCAR) or Missing at Random (MAR). Data was found to be MAR, with no variables exceeding 20% of values missing. Given this outcome, it was determined that the analysis could continue without the need for any missing data correction (Adcock, 2016). Data were analyzed using STATA 14 (StataCorp, 2017). As research questions 1a and 1b stated, the distribution and central tendency was reviewed so gain a better understanding of the overall data, and identify any trends between participants.

RESULTS

In response to research questions 1a and 1b, descriptive statistics were run on the outcome variables KNOW, teacher self-perceived knowledge of online student characteristics and identities and SKILL, teacher self-perceived skills in addressing their needs. The results of this calculation can be seen in Table 2.

Table 2
Summary of Dependent Variable KNOW

Variable	Obs.	Mean	Std. Dev.	Min	Max
KNOW	125	3.31	.48	2.09	4

Teachers were confident in their knowledge of the possible identities that may be present in their online classrooms, with a mean knowledge score of 3.30. Teachers felt most confident in their understanding of Racism and Nationality (Mean 3.616, SD .50 and .52) and least confident in their understanding of Affectional Orientation (Mean 2.44, SD .98). Table 3 outlines the means and standard deviations of all items listed in the knowledge subscale.

Table 3
Means & Standard Deviations of Knowledge Subscale

Variable	Obs.	Mean	Std. Dev.	Min	Max
Culture	125	3.59	.49	3	4
Ethnicity	125	3.54	.59	1	4
Racism	125	3.62	.50	2	4
Mainstreaming	125	3.44	.63	1	4
Prejudice	125	3.6	.52	2	4
Multiculturalism	125	3.42	.66	1	4
Ethnocentrism	125	2.96	.98	1	4
Pluralism	125	2.8	.95	1	4
Privilege	125	3.5	.59	1	4
Equity	125	3.47	.6	2	4
Conscious Bias	125	3.32	.79	1	4
Unconscious Bias	125	3.28	.82	1	4

Table 3, *Continued*

Variable	Obs.	Mean	Std. Dev.	Min	Max
Assimilation	125	3.3	.76	1	4
Equality	125	3.55	.59	1	4
Race	125	3.6	.51	2	4
Nationality	125	3.62	.52	2	4
Class	125	3.57	.54	2	4
Acculturation	125	2.79	.99	1	4
Oppression	125	3.34	.73	1	4
Affectional Orientation	125	2.44	.98	1	4
Gender ID	125	3.35	.66	1	4
Integration	125	2.7	.64	1	4

In reference to research question 1b, the researcher in this study created a variable SKILL, consisting of the mean of all responses to subscale C from the MAKSS-T survey measure. The results of this calculation are shown in Table 4.

Table 4
Summary of Dependent Variable SKILL

Variable	Obs	Mean	Std. Dev.	Min	Max
SKILL	110	3.11	.52	1.84	4

Note. While 125 (n = 125) participants completed the full survey, only 110 (n = 110) of survey participants engaged in Subsection C: Skill.

While the sample overall was still fairly confident in their skills in addressing the needs of their online students, this confidence was noticeably less than the variable KNOW, with a Mean of 3.11 and a Standard Deviation of .52. Teachers felt most confident with their skills in teaching students of different cultural backgrounds (M = 3.38, SD =.60) and least confident in their skills in critiquing multicultural research (M=2.69, SD=.82). Table 5 outlines the means and standard deviations of all items listed in the skills subscale.

Table 5
Means & Standard Deviations of Skills Subscale

Variable	Obs	Mean	Std. Dev.	Min	Max
SkillsDiff	110	3.38	.61	2	4
SkillsAssess	110	3.2	.70	1	4
FormalInformal	110	3.35	.64	2	4
Bias2Teacher	110	3.25	.69	2	4
ID Bias	110	3.1	.69	1	4
Method	110	3.03	.71	1	4
BehaveCult	110	3.05	.74	1	4
CultComm	110	2.79	.73	1	4
Standardized	110	2.85	.74	1	4
Critique	110	2.69	.82	1	4
ServiceCulture	110	3.18	.68	1	4
ConsultPro	110	3.35	.57	2	4
Resources	110	3.09	.75	1	4
BehaveFemale	110	3.26	.63	2	4
BehaveMale	110	3.24	.65	2	4
Older	110	3.19	.71	1	4
Homosexual	110	3.12	.77	1	4
Lesbian	110	3.12	.81	1	4
MentalHealth	110	2.85	.82	1	4

Research questions 2a & 2b in this study sought to identify any possible relationships between knowledge, skill and academic field. A Hierarchical Linear Modeling (HLM) analysis was performed to assess the significance of relationships between academic field and level of knowledge and skills. An unconditional model was first run to determine if there was any relationship between academic field and a teacher's self-perceived knowledge of the various identities of their online students. Results of the unconditional model for dependent variable KNOW indicate a mean of 3.326, indicating the existence of clustering at the subject level. This model demonstrates variation among the subject level of the model, with an Interclass Correlation Coefficient (ICC) of .05, indicating that at least 5% of the variation is occurring at the second level of the model (Raudenbush & Bryk,

2002). This reinforced the researchers' use of HLM, as subtle differences are brought out which other statistical measures may have missed. These may seem quite small, but can still be statistically significant. As this model demonstrated significant variations between academic fields ($p < .001$), further analysis of the subject area differences was conducted utilizing the predict command in STATA. Results of this analysis can be seen in Table 6.

Table 6

Results of Predictive Analysis of Academic Fields for KNOW

Academic Field	Residual Effect
Math	-.21
World Language	-.1
Multiple Subject Taught online	-.05
Art	-.02
P.E.	.01
Science	.01
K5	.016
Social Studies	.05
Language Arts	.06
Career & Technical Education	.24

Results of the analysis demonstrate differences in confidence exist among academic fields. Of the 11 academic fields, teachers in Career and Technical Education felt as if they had a greater knowledge of the types of diverse characteristics among students, as they demonstrated the most positive random effect, while teachers in the area of mathematics were not as confident.

A second unconditional model was run for dependent variable SKILL. Results of the model for SKILL indicate a mean of 3.16, somewhat higher than the mean for variable SKILL calculated in the descriptive statistics. This model also demonstrates variation among the subject level of the model, with an ICC of .10, indicating that at least 10% of the variation is occurring at the subject level (Raudenbush & Bryk, 2002). As this model also demonstrated significant variations between academic fields ($p < .001$) further analysis of the subject area differences was conducted utilizing the predict command in STATA. Results of this analysis can be seen in Table 7.

Table 7
Results of Predictive Analysis of Academic Fields for SKILL

Academic Field	Residual Effect
Math	-.1
World Language	.01
Multiple Subjects Taught Online	.01
Art	-.02
P.E.	-.001
Science	-.02
K5	-.02
Social Studies	.05
Language Arts	.05
Career & Technical Education	.03

The PREDICT analysis of SKILL demonstrates that of the 11 academic fields, teachers of Language Arts felt as if they had a high skill level in addressing the needs of diverse online students, as they demonstrated the most positive random effect. Teachers of Social Studies scored similarly. Career and Technical Education did not have as strong of a positive value as in the analysis of the variable KNOW, however these teachers still had a positive predictive value. Teachers of mathematics were again the lowest predictive score, indicating that they were not as confident in their skills in addressing the needs of diverse online students.

Additional models were run to address research questions 3a and 3b to determine whether or not this effect was moderated by personal characteristics of participating teachers. The dependent variable KNOW was analyzed first. In this model, only one level 1 predictor was significant: Teaching Experience, ($p < .001$). The output demonstrates that for every five additional years of teaching experience self-perceived knowledge of the types of identities that might be found in their online students increases by .16. Therefore, the variable EXP (experience) can be seen to moderate the relationship between knowledge of the types of diverse identities possible in students (KNOW) and academic fields.

An additional model was run, removing all insignificant predictors in the prior analysis, leaving only the level 2 cluster of Academic Field (SUB) and the level 1 predictor of Experience Teaching (EXP). In this model, the level 1 predictor EXP continued to be significant ($p < .00$), with a coefficient of .20.

The output demonstrates that for every five additional years of teaching experience, self-perceived knowledge of the types of identities of their online students increases by .20. Table 8 provides a summary of these models.

Table 8

Fixed Effects Estimates (Top) and Variance-Covariance Estimates (Bottom) for Models of the Predictors of the Dependent Variable KNOW

Parameter	Model 1 (Null)	Model 2	Model 3
		Fixed Effects	
Intercept	3.16	2.66	2.66
Level 1 (Teacher Characteristic)			
Gender		-.07	
Age		-.004	
Grade level taught		.05	
Years teaching experience		.16*	.20*
Years teaching online		.06	
Level 1 Variance	.22	.18	.18
		Random Parameters	
Level 2 (Academic Field)			
Intercept	.03	.01	.01
-2 log likelihood	80.62	71.11	72.39

Note: *$p<.05$

Another HLM analysis was run to test research question 3b, utilizing the dependent variable SKILL as the outcome, with the same moderators. In this model, there were no significant predictors for the outcome SKILL at the $p < .05$ level. However, the predictor EXPONLINE, years of experience teaching online, had a p-value of .05. While this does not meet the threshold for significance (Mitchell & Jolley, 2007), it is close enough to be noted in this analysis. Based on this finding, for every increase in experience teaching online (5 years) there is an increase of .13 in self-perceived skills in addressing the needs of diverse students.

To test the significance of this predictor when all other predictors were removed, an additional analysis was run to see if the variable EXPONLINE moderated the relationship between Academic Field (SUB) and level of self-perceived skills (SKILL). When removing all insignificant predictors

from the model, the variable EXPONLINE does indeed become significant ($p < .05$). Therefore, for every five years of experience teaching online, a K-12 online teacher's self-perceived skill level in addressing the needs of diverse online students increases by .15. A summary of the models for the analysis of research question 3b can be seen in Table 9.

Table 9

Fixed Effects Estimates (Top) and Variance-Covariance Estimates (Bottom) for Models of the Predictors of the Dependent Variable SKILL

Parameter	Model 1 (Null)	Model 2	Model 3
		Fixed Effects	
Intercept	3.16	2.72	2.9
Level 1 (Teacher Characteristic)			
Gender		.08	
Age		-.05	
Grade level taught		-.004	
Years teaching experience		.07	
Years teaching online		.07*	.15*
Level 1 Variance	.24	.18	.21
		Random Parameters	
Level 2 (Academic Field)			
Intercept	.03	.02	.01
-2 log likelihood	80.62	77.52	78.1

Note: *$p < .05$*

DISCUSSION

Analysis of distributions and measures of central tendency, which allows for summation of overall trends from the data, reveals that teachers felt their knowledge of student characteristics and identities was adequate. Without further analysis the conclusion may be drawn that study participants are well-equipped with the knowledge necessary to shape the online classroom in such a way that takes into account these diverse students' needs (Altugan, 2015; Damary, Markova & Pryadilina, 2017; Dean & Jolly, 2012).

When examining the individual survey questions within the outcome variables, certain responses to specific questions emerge as points for discussion. For the outcome variable KNOW, the terms in which teachers express the greatest level of confidence in their knowledge are "Racism" and "Nationality," while expressing the lowest level of confidence in their knowledge for "Affectional Orientation." Literature on these concepts as part of pre-service teacher education support this argument, citing issues of sexuality as a gap in the curriculum of teacher preparation programs (Sanders, Haselden & Moss, 2013).

Analysis of the second outcome variable SKILL suggests there are clear differences between what teachers have confidence in addressing, and their areas of limited skill. Of the 19 skills questions present, participants are most confident in their ability to address the needs of online students with cultural backgrounds different from their own. This finding is consistent with the study by Tapanes, Smith and White (2009), where 100% of the teachers felt as if they were aware of the cultural differences and the subsequent needs of their students, however, students did not feel as if their teachers had the levels of knowledge and skill reported, nor did they feel that their unique characteristics and identities were taken into consideration in their online courses. Further, Tapanes et al. (2009) found that while instructors feel confident in their abilities to address these issues, they report having no actual knowledge of the cultural differences present in their online courses. In fact, some instructors note that when they were aware of minority students in their courses they didn't see a need for change as those students did not ask for accommodations. These students, however, may not ask for assistance despite needing additional scaffolding to be successful in an online course (Kim & Lee, 2011). In addition, aligned with Lozano-Verduzco and Mendoza (2016), the teachers surveyed illustrated their perceived skills necessary to teach in an online environment with students who may identify as homosexual, which substantiates Lozano-Verduzco and Mendoza claims, and illustrates the importance of further opportunities for teachers to have professional development centered around online learning and sexual orientation.

The areas in which participants feel weakest in their abilities was in critiquing multicultural research. Given the continuing criticism regarding the divide between research and practice in the field of K-12 online education (Rice, 2014) and the lack of K-12 online programs' ability to collect and analyze data to better inform practice (Ferdig & Cavanaugh, 2011), such a finding demonstrates support for this issue in educational practice and the impact that the divide between practitioners and research may have on meeting the needs of diverse students. Kennedy and Ferdig (2014) note that many new to online learning approached both research and practice as if

they were "discovering it for the first time", unaware of the nearly twenty years of research that can inform both future research and current educational practice. Daum and Buschner (2014) further argue that online learning research lags behind practice and such a disconnect is pushing online learning ahead at a rate potentially detrimental to students. As online learning continues to grow, and the student population continues to change, it is imperative that K-12 online teachers are given the tools necessary to not only access the research in the field, but to understand the lessons gleaned from this research. The need for K-12 online teachers to be provided access to multicultural research and also be given the tools to critique this research is important in increasing the overall professionalism of K-12 online teachers. As the literature notes a need for online teachers to understand the types of students that may be in their courses (Du, Zhou, Xu & Lei, 2016; Tapanes, Smith & White, 2009), additional professional development and pre-service training to educate teachers on these student characteristics may lead to increased overall knowledge as well as improved skills in addressing these needs.

CONCLUSIONS AND LIMITATIONS

There are limitations to this study that may affect the generalizability of the findings. As this survey was a self-reported measure, results may be influenced by social desirability (Mitchell & Jolley, 2012). Self-reported measures also raise the question of how well self-perceptions align with real knowledge, as was evident in the study by Tapanes et al. (2009) where participants report a higher awareness of the diversity among their online students than is evident in the student data. Participants in this study may have reported a higher level of skill or knowledge in the survey than they possess. Also, participants seemed to fully appreciate the difference implied with the terms knowledge and skills, as the subject matter discussed was uncomfortable. Larson and Bradshaw (2017) note that practitioners in youth services (counselors, teachers, social workers) may respond to questions in ways that they feel are socially acceptable, especially when it comes to sensitive issues such as cultural competence and student identity. Further, this study focused on K-12 online teachers and did not survey their students to correlate teacher perceptions with accurate characteristics and identities of those students. Therefore, utilizing only the results in this survey, it is not possible to triangulate K-12 online teacher responses with the actual identities and characteristics of their students. Finally, this study, while referencing international literature, focused on K-12 online teachers in the United States and therefore their knowledge of these identities in the context of American culture and American slang. Berry and Cadis (2013) point

out that while American classrooms are now culturally diverse, the culture of White Americans still dominates and can influence teacher perceptions. Even with the introduction of instructional designers into educational spheres, who offer a larger demographic than traditionally seen in face-to-face classrooms, the culture of American aligns with White America.

Recommendations for future research include expanding elements of the present study by addressing the limitations noted above. A self-reported survey might be replaced with observations of online teachers, or triangulated with confirmatory information provided by online students. This study provides a basis for future research into K-12 online teachers' understanding of the field of the online classroom, and how their knowledge and skills in addressing diverse student needs can shape this field. K-12 online education is no longer an emerging practice (Barbour, 2011), but a rapidly growing field that serves an increasing number of students (Gemin et al., 2015). Online education has been widely heralded as a way to create equitable spaces for a multitude of students from varied backgrounds, but research on this claim is scant. Findings from this study inform our understanding of the experiences of the K-12 teachers responsible for students in online environments, and begins to shed light on a topic not widely considered within online learning.

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