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The Development of the Multicultural Awareness, Skills, and Knowledge Survey: An Instrument for Assessing the Cultural Competency of Pre-service Teachers

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Based on data from the National Center for Education Statistics in the United States, the public school student population is becoming more diverse (2003, 2011). As a result of this, teachers need to be culturally competent so they can meet the unique needs of the diverse student body they will be teaching. This quantitative study offers an examination into the creation of an instrument, the Multicultural Awareness, Skills, and Knowledge Survey (MASKS), used to measure the cultural competency of pre-service teachers, as well as a preliminary analysis of the data findings. This document provides a description of the steps used to create the MASKS, the results of the pilot and final field test of the instrument, and concludes with the study findings.

KEYWORDS: Multicultural Awareness, cultural competency instruments, pre-service teachers

According the National Center for Education Statistics, the United States K–12 student population is becoming more diverse (2003, 2010). As a result, pre-service teachers need to be culturally competent so they can meet the unique needs of the diverse student body they will be teaching. This quantitative study offers an examination into the creation and preliminary results of a survey instrument used to measure the cultural competency of pre-service teachers. Based on previous survey development research (Author, 2003; Fernandez, Ferrer-Cascales, Reig-Ferrer, Albaladejo-Blázquez, & Author, 2015; Fraser, 1986; McNeal, Author, Rutherford, 2015; Williams, 2007), this investigation followed clearly defined steps, a review of the pilot by both experts in the field and pre-service teachers, and a final field test of the instrument with a larger population of pre-service teachers. The results of the field test were examined, which includes analyzing items and scales to determine validity and reliability. Finally, the data were analyzed by comparing the means of each scale.

It is believed that a disconnect can exist between teachers and their K–12 students as a result of cultural differences, which can cause challenges in students learning; therefore, teachers should not only be aware of these differences but should also use culturally relevant materials to

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help students connect school and home (Aronson & Laugher, 2016; Gay, 2013; Nelson & Guerra, 2014). Ladson-Billings (1994) described culturally relevant teaching as "a pedagogy that empowers students intellectually, socially, emotionally, and politically by using cultural referents to impart knowledge, skills, and attitudes. These cultural referents are not merely vehicles for bridging or explaining the dominant culture; they are aspects of the curriculum in their own right" (p. 18). In short, she is giving worth to the student's cultural background and thereby showing them it is important. It is important to note that all students, not just minority students, benefit from their teachers' being more culturally aware and knowledgeable (Fuller & Ahler, 1987).

It should be noted that effective and successful teaching requires many things including, but not limited to, being knowledgeable about the content being taught, the methods of how to teach, and pedagogy concerning how students learn (Borg & Gall, 1989; Darling-Hammond, 2006; Gay, 2002). As a result, a vast number of teacher education programs focus on these key elements for pre-service teacher education. However, knowing only content, pedagogy, and methods does not necessarily create an effective and successful teacher. The cultural competence of teachers and pre-service teachers is one of these variables that has been and is still being investigated by educators (Aronson & Laugher, 2016; Bezrukova, Spell, Perry, & Jehn, 2016). Cultural competence is important for pre-service teachers because teachers are the second most significant individual in a child's life after their parents (Young & Householder, 1992).

Need for the Study

The need for this research exists because pre-service teachers are more than likely going to be working with student populations that are different from themselves (Darling-Hammond, 2006; Gay, 2002). Therefore, these future teachers need to be culturally competent to meet the needs of their students who are from diverse racial, ethnic, and socio-economic backgrounds (Darling-Hammond, 2006; Dover, 2013; Gay, 2002). Additionally, most research conducted with pre-service teachers takes place at universities, whereas this investigation was conducted with community college pre-service teachers. Furthermore, the participants in most studies tend to be White, while the population surveyed here was 67.5% minority.

To better assess educators' thoughts and ideas concerning diversity issues, researchers have developed a variety of survey instruments and inventories, which date back to the 1950s (Haj Broussard & Henny, 2009; He & Cooper, 2009; Henry, 1986, 1995; Koyama, Plash, & Davis, 2011–2012; Milner et al., 2003; Pettus & Allain, 1999). These quantitative tools have been used with both pre-service and in-service teachers and have measured a vast array of variables such as attitudes about social situations, acceptance of others with differences from oneself, and perceptions and knowledge about dissimilar groups. However, there appears to be an absence of a valid and reliable instrument that specifically evaluates multicultural *awareness*, *skills*, and *knowledge*.

The above listed domains were derived from the Multicultural Competence framework which emphasized the significance of cultural competency (Sue & Sue, 2003). Sue and Sue's (2003) work, while focused on psychology and counseling, can and has been readily applied to pre-service teacher education. These domains were used to describe characteristics counselors should have as they interact with, provide services to, and meet the needs of culturally diverse clients. More specifically, these domains can be used to research how pre-service teachers

respond when questioned about working with and meeting the needs of students from diverse populations.

Conceptual Framework

The conceptual model used for this study was modified from Sue and Sue's (2003) Multicultural Competence framework in which they emphasize the significance of cultural competency. As previously noted, the model was originally created for counselors and psychologists, but educators have adapted much of this work to be applicable with teacher education research (D'Andrea, Daniels, & Noonan, 2003; Henry, 1995; Prieto, 2012). Constantine and Sue (2006) also found connections between the Sue and Sue model (2003) and cultural competency in education. This framework is grounded in three dimensions: "(a) specific racial/cultural group perspectives, (b) components of cultural competence, and (c) foci of cultural competence" (Sue, 2001, p. 790). This can be used to research how pre-service teachers respond when questioned about working with and meeting the needs of students from diverse populations.

Cultural Competency Instruments

The history of survey research measuring racial attitudes and awareness of teachers, as well as how people accept others different from themselves, has a decades-long history (Fey, 1955; Kogan & Downey, 1956). It is important to note that these early instruments only asked White people their perceptions of Blacks, racial issues, and discrimination. No historical research instruments found indicated that Blacks or any other minority groups were asked their opinions or perceptions about Whites or racial situations.

Further, research demonstrated that some academics were interested in measuring attitudes concerning how one population thinks about or views groups different from themselves. Examples of these include Kogan and Downey's Social Situation Scale (1956), Fey's (1955) Acceptance of Others and Acceptance by Others Scale, and Giles and Sherman's Measurement of Multicultural Attitudes Questionnaire (1982). Additionally, the Bogardus' Social Distance Scale (1933, 1958) evaluated social and racial distance among groups of people, and this scale has been revised and used by many other researchers (Bennett et al., 1990; Byrnes & Kiger, 1987; Giles & Sherman, 1982).

More recently, surveys administered in the 1980s delved more deeply into issues of race, culture, acceptance, attitudes, perception, and multiculturalism in education and pre-service teacher programs (Byrnes & Kiger, 1987; Campbell & Ferrell, 1985; Cooper, Beare, & Thorman, 1990; Giles & Sherman, 1982; Guyton & Wesche, 2005; Marshall, 1992; Martin & Koppleman, 1991). Some instruments focus on *attitudes* and *perceptions* of multiculturalism; whereas, others spotlight *knowledge*, and yet, others attempt to predict the *acceptance* of multicultural ideals.

Instruments used to measure multicultural attitudes about minority groups include the Vega Attitude Inventory (Martin & Koppleman, 1991), Zeigler's Preference for Social Diversity Scale (Chiang, 1994), and the Multicultural Beliefs Instrument (Reiff & Cannella, 1992). It should be noted that most of the populations surveyed were, and still are, White and from middle-class backgrounds. These surveys investigated what attitude the teacher, or pre-service teacher, has toward people of color or minorities.

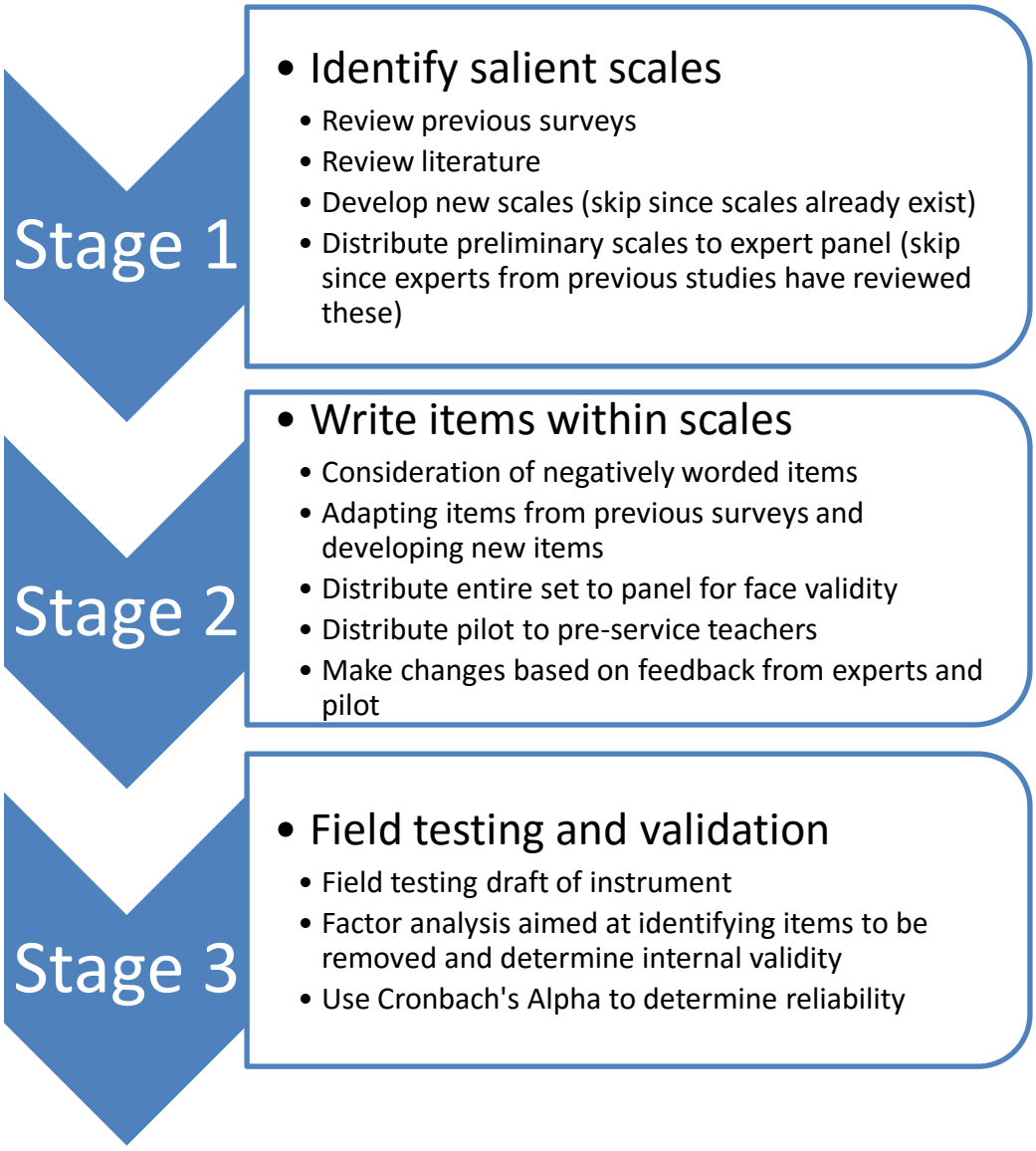
Surveys Used to Guide Scale and Item Development

In addition to the influence of the literature and instruments previously mentioned, there are some specific surveys that served to guide the development and creation of the new Multicultural Awareness, Skills, and Knowledge Survey (MASKS). These include Henry's (1986) Cultural Diversity Awareness Inventory; D'Andrea, Daniels, and Noonan's (2003) Multicultural Awareness-Knowledge-Skills Survey; Spainerman et al.'s (2010) Multicultural Teaching Competency Scale; and Prieto's (2012) Multicultural Teaching Competencies Inventory.

These four research instruments were carefully chosen for specific reasons. The latter three surveys were developed using Sue and Sue's (2003) conceptual model as their foundation, and all three set-out to create surveys using the domains of *awareness, skills,* and *knowledge.* Two of these studies, the Multicultural Teaching Competency Scale (Spainerman et al., 2010) and the Multicultural Teaching Competencies Inventory (Prieto, 2012), struggled and ultimately failed to validate the scale of *awareness*, so only the Multicultural Awareness-Knowledge-Skills Survey-Teachers (D'Andrea, Daniels, & Noonan, 2003) has an awareness scale. However, the factor analysis used by D'Andrea, Daniels, and Noonan employed minimally rigorous standards to allow some awareness items to remain in the scale. Therefore, items from the Cultural Diversity Awareness Inventory (Henry, 1986) were included to increase the prospects of creating a valid *awareness* scale in addition to the *skills* and *knowledge* scales.

Research Methods

This investigation used a quantitative paradigm and included survey development and data analysis with exploratory factor analysis (EFA). A three-stage approach used by other survey developers provided guidance in the creation of the Multicultural Awareness, Skills, and Knowledge Survey (Author, 2003; Williams, 2007). The survey development stages include (1) identifying and reviewing salient scales from instruments that have already been developed; (2) adapting previously developed scales, creating new ones as needed, and writing individual items; and (3) field testing the instrument and analyzing the data (Author, 2003; Williams, 2007; Worthington & Whitaker, 2006). In the first stage, one of the steps would normally be to classify new scales to make certain there is adequate coverage of each of the domains. However, since Sue and Sue (2003) defined the three domains of *awareness, skills,* and *knowledge,* these were used as the initial scales for this survey, and therefore, this step was skipped. Instead, during the pilot and field-testing stages, careful attention was paid to the factor loadings of each scale to see whether additional scales or subscales were needed or identified. Figure 1 shows in more detail the steps that were followed for the survey development.



For further clarification in stage 2, we examined items from the aforementioned surveys and adapted them as needed. For instance, many of the items in the Multicultural Teaching Competencies Inventory (Prieto, 2012) were double barreled, meaning the item was asking about more than one issue and only allowing for one answer. The result of this can be inaccuracies of what is being measured. An example of this, the MTCI (Prieto, 2012) item states, "I have specific knowledge of the different cultural values that students from diverse groups bring to the classroom and to their learning experiences." The 'and' in this creates a double barreled item. Another item from the same survey states, "I have specific knowledge of the institutional and systemic barriers/obstacles that can affect the educational experiences of students from diverse student groups." Further, many of the items in these surveys had the same stem, or beginning part of the item, so to simplify this we grouped these items together with one stem and multiple

item responses. The results are the following items from the MASKS, "I have knowledge of the institutional barriers that can affect the educational experiences…

1. of racial and ethnic minority groups.
2. of students from low socioeconomic backgrounds.
3. of gay, lesbian, bisexual, and transgendered students.
4. of diverse students."

It is clear that these items were adapted from the MCTI but are worded differently and asking for distinctive information when compared to the MCTI.

The setting for this research was five community colleges located in central Texas. Each of the colleges has a diverse student population. The target population included up to 500 pre-service teachers. The study employed a nonprobability sample of convenience of pre-service teachers taking one of two education related courses.

A 5-point Likert-type response scale was used to gather participant's answers. The 5-point response scale consisted of 1 – not at all, 2 – to a very small extent, 3 – to a moderate extent, 4 – to a great extent, and 5 – to a very great extent.

Pilot of the Multicultural Awareness, Skills, and Knowledge Survey (MASKS)

Content validity of the pilot was determined by an expert panel made up of eight educators who reviewed the draft instrument. The panel consisted of three community college faculty (one from teacher education, one from psychology, and one expert in survey development) and two others were teacher education faculty at four-year universities. Additionally, three experts were from the K–12 system, with one being in administration, one a classroom teacher, and one academic specialist. Together members of this panel had in-depth experience in the fields of multicultural education, teacher education, social justice, psychology, and survey development.

After initial items were reviewed, the MASKS was piloted with 64 items to 66 pre-service teachers. The pre-service teachers answered the survey items, kept track of the time to complete the survey, and made note of any items and terms that seemed confusing or unclear to them. The results of the pilot demonstrated that the survey took 8–15 minutes to complete. Some pre-service teachers stated that the definitions of *knowledge* and *skills* were not clear. Based on this feedback we modified the *knowledge* and *skills* definitions for more clarity and item length.

Field Test

The revised 64-item MASKS field test was administered to pre-service teachers enrolled at five community colleges over a four-month period. In total, 476 responses were recorded during this time; however, 30 of them were discarded for being incomplete, resulting in 446 useable responses.

Construct Validity

The MASKS instrument was created to measure the cultural competency of pre-service teachers. Cultural competency is a construct, which is a set of complex ideas people create in order to summarize observations about ideas or things we cannot physically see (Williams,

2007). Therefore, construct validity, according to Huck (2008), reveals "how much of a personality or psychological construct is possessed by the examinees to whom the instrument is administered" (p. 92). To determine construct validity, the researcher can do a variety of analyses, one of those being to conduct a factor analysis to explore the constructs mathematically determined by the field test instrument (Huck, 2008).

The 446 responses to the 64-item MASKS field test were analyzed for validity through exploratory factor analysis. One way to describe factor analysis is that "it is a statistical analysis that can assess which variables 'hang together' and how different this group of variables is from other sets" (Streiner, 2013, p. 111). In a factor loading matrix, "each row reflects one of the variables, and each column represents one of the factors" (p. 116). These factor loadings show the strength of the relationship between the variable (item) and the factor (scale).

Based on the precedence set by other survey researchers (Author, 2003; D'Andrea et al., 2003), we chose Varimax rotation with Kaiser Normalization to get the factor loadings. The end product of this analysis is a Rotated Component Matrix. This matrix shows factor loadings for all of the variables of the survey. In simple terms, factor loadings show the relationship of each variable to the underlying factor (Kim & Mueller, 1978). Moreover, items that load closer to 1 are essential in the understanding of the factor; whereas, items that load closer to 0 are less essential in the explanation of that factor (Brown, 2009). In order to create a strong survey, 0.60 was used as the factor loading cutoff and all items that loaded lower than 0.60 on their own a priori scale or across scales were removed. This cutoff was chosen due to research that suggests that if there are four or more items loading above 0.60 in a scale, they are reliable regardless of sample size (Tabachnick & Fidell, 2001). Upon first analysis ten items were removed due to poor overall factor loading resulting in a refined MASKS consisting of 54 items.

This analysis was also used to determine whether the items loaded on three a priori scales of *knowledge*, *skills*, and *awareness*; however, some items failed to load sufficiently on these scales. Nevertheless, a posteriori subscales became evident within each of the *knowledge*, *skills*, and *awareness* primary, a priori scales.

Table 1

A Posteriori Subscales

Knowledge Subscales
(K1) - Knowledge of institutional barriers and teaching strategies
(K2) - Knowledge of gay, lesbian, bisexual, and transgendered issues related to education
Skills Subscales
(S1) - Skills and ability to teach and assess diverse populations
(S2) - Skills to comfortably communicate with diverse populations
Awareness Subscales
(A1) - Awareness of the cultural biases and stereotypes that the pre-service teacher brings
(A2) - Awareness of how the pre-service teacher's cultural background influences their teaching
(A3) - Awareness that the academic difficulties that students have are not the fault of the student

Table 2 presents the factor loadings for each scale and a posteriori subscale for the MASKS.

Table 2

Factor Loadings for the Refined 54-Item Version of the MASKS

Scale	**Knowledge**	**Knowledge**	**Skills**	**Skills**	**Awareness**	**Awareness**	**Awareness**
	K1	K2	S1	S2	A1	A2	A3
Sub-Scale	Institutional Barriers & Teaching Strategies	Gay, Lesbian, Bisexual, & Transgender	Ability to Teach as Assess	Comfortable Communicating	Cultural Biases & Stereotypes	Cultural Background Influence	Academic Difficulties
K1 – 1	.74						
K1 – 2	.73						
K1 – 3	.72						
K1 – 4	.79						
K1 – 5	.81						
K1 – 6	.66						
K1 – 7	.73						
K2 – 8		.65					
K2 – 9		.62					
K2 – 10		.73					
K2 – 11		.70					
K2 – 12		.76					
S1 – 13			.73				
S1 – 14			.71				
S1 – 15			.75				
S1 – 16			.61				
S1 – 17			.81				
S1 – 18			.83				
S1 – 19			.81				
S1 – 20			.70				
S1 – 21			.72				
S1 – 22			.73				
S2 – 23				.80			
S2 – 24				.79			
S2 – 25				.71			
S2 – 26				.63			
A1 – 27					.75		
A1 – 28					.82		
A1 – 29					.80		
A1 – 30					.73		
A1 – 31					.83		
A1 – 32					.82		
A1 – 33					.76		
A1 – 34					.77		
A1 – 35					.74		
A1 – 36					.69		
A2 – 37						.63	
A2 – 38						.80	
A2 – 39						.75	
A2 – 40						.77	
A2 – 41						.78	

A2 – 42	.78	
A2 – 43	.74	
A2 – 44	.81	
A2 – 45	.81	
A2 – 46	.78	
A2 – 47	.79	
A2 – 48	.79	
A3 – 49		.80
A3 – 50		.80
A3 – 51		.81
A3 – 52		.78
A3 – 53		.84
A3 – 54		.82

Notes. Factor Loadings smaller than 0.60 have been omitted.
K1 = Knowledge of Institutional Barriers and Teaching Strategies
K2 = Knowledge of Gay, Lesbian, Bisexual, and Transgendered issues related to teaching
S1 = Skills and the Ability to Teach and Assess
S2 = Skills and Comfortable Communicating with Diverse Populations
A1 = Awareness of Cultural Biases and Stereotypes
A2 = Awareness of Cultural Background Influence
A3 = Awareness of Academic Difficulties
Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

Reliability

Reliability, which can be synonymous with consistency, accuracy, and stability (Author, 2003; Kerlinger, 1986), measures the internal consistency of a survey instrument. Cronbach's alpha (α) coefficient represents the internal consistency of an item's intercorrelation to a scale (Kerlinger, 1986).

Cronbach's alpha coefficient is measured between the range of -1 and 1. According to Nunnally (1978) alpha scores above 0.70 are acceptable. More specifically, DeVellis (2012) stated that 0.60 or under is unacceptable and 0.60 to 0.70 is undesirable or minimally acceptable. He contends that the respectable range is between 0.70 and 0.80 and very good is between 0.80 and 0.90. DeVellis (2012) comments that instruments with an alpha coefficient much greater than 0.90 might need to be shortened. However, George and Mallery (2001) suggest the closer the alpha is to 1, the greater the internal consistency of the items; therefore, we have chosen to leave the scales and subscales intact and not reduce the number of items.

We assessed the overall instrument results and the posteriori scale results of the field test of the MASKS (Table 3).

The subscales of K1, K2, S1, S2 and A1, A2, A3 all resulted in alpha scores of 0.90 or higher, with A2—Awareness of Cultural Background and Influence—having the highest alpha at 0.97. The subscales K2—Knowledge of Gay, Lesbian, Bisexual and Transgendered issues related to education—and the sub-scale S2—Skills of Comfortable Communicating with diverse populations—measured the lowest alpha score at 0.90 each.

Table 3

Cronbach's Alpha Coefficient for the MASKS Scales and a Posteriori Subscales

Scale	A Posteriori Subscale	Number of Items	α Reliability
Knowledge		**12**	**.93**
	(K1) Institutional Barriers Teaching Strategies	7	.91
	(K2) Gay, Lesbian, Bisexual, Transgender	5	.90
Skills		**14**	**.95**
	(S1) Ability to Teach and Assess	10	.95
	(S2) Comfortable Communicating	4	.90
Awareness		**28**	**.97**
	(A1) Cultural Biases and Stereotypes	9	.96
	(A2) Cultural Background Influence	12	.97
	(A3) Academic Difficulties	6	.94
MASKS Survey Overall		**54**	**.97**

The scale with the lowest alpha score was the *knowledge* scale measuring 0.93 overall. Examining the alpha reliability of the entire MASKS shows an impressive 0.97 alpha score.

Major Findings and Implications for Educational Leadership Practitioners and Programs

One major outcome of this investigation was the creation of a valid and reliable cultural competency survey with scales measuring *awareness*, *skills*, and *knowledge*. However, instead of factor loadings resulting in three a priori scales, the factor analysis resulted in a posteriori subscales within each scale.

Other researchers have struggled to validate an *awareness* scale. The MASKS not only includes a valid *awareness* scale, it includes 28 *awareness* items, which all factor at a rigorous level of 0.60 or higher in the three a posteriori subscales. It is interesting to note that all but two of the items load at 0.70 or higher making this scale extremely robust.

Another major finding of this research is associated with the *knowledge* scale and its a posteriori subscales. The results from the factor analysis show all items in the *knowledge* scale that discussed GLBT (gay, lesbian, bisexual, transgender) issues loaded into their own subscale. Yet, when items with the focus on GLBT were presented in the *skills* and *awareness* scales, they did not load onto their own subscale but instead loaded with the other characteristics of that scale. The fact that the GLBT items only factored into their own subscale in the *knowledge* scale shows that MASKS instrument is sensitive enough to identify these different aspects of cultural competency knowledge.

One other major finding centers on the *skills* scale; all *skill* items labeled S1, which focus on teaching and assessing students from diverse populations, factor into one scale, while the four items labeled S2, which asks about the pre-service teachers' comfort level communicating with students from diverse populations, factor into a separate subscale. This is pertinent information demonstrating that the MASKS is finely tuned to extract varying aspects of skills.

Further findings resulted from a preliminary analysis of the data; this first analysis included comparing means for each of the sub-scales (Table 4). The results demonstrated that pre-service teachers had limited knowledge of education issues about the gay, lesbian, bisexual,

and transgender population; on the contrary, the results suggested that preservice teachers are comfortable communicating with diverse populations (Table 4).

Table 4

Mean and Standard Deviation of MASKS

	K1	K2	S1	S2	A1	A2	A3
Mean	3.30	2.87	3.94	4.35	3.62	3.89	3.95
Standard Deviation	1.10	1.23	1.01	0.91	1.18	1.14	1.07

The implications of this research suggest that education leadership and preparation programs are doing an impressive job ensuring that pre-service teachers are comfortable communicating with groups of people who are different from themselves. On the other hand, the results show that these teacher preparation programs need to provide pre-service teachers more opportunities to learn about GLBT issues as they relate to education. There are a variety of ways to accomplish this including having pre-service teachers participate in research on these topics, providing supporting resources and safe spaces for future teachers to discuss, question, and learn about GLBT issues associated with schools and education, and ultimately helping pre-service teachers gain knowledge and confidence in this area.

Recommendations for Future Research and Conclusion

Further exploration using the MASKS could provide important insights to the field of pre-service teacher education. One recommendation for future research includes a follow-up study using confirmatory factor analysis with the MASKS. This could be used to extend and clarify further "insight into a survey instrument beyond that afforded through the typical exploratory factor analytic approach" (Swisher, Beckstead, & Bebeau, 2004, p. 784).

Additional studies using the results from the MASKS could analyze the *awareness, skills,* and *knowledge* of pre-service teachers and use this information to improve pre-service teacher education. An additional recommendation for future research includes doing a comparative analysis study. Examples of comparative studies could include comparing survey results from community college and university pre-service teachers or pre-service teachers in their first year of college compared to graduating seniors. The result of this could be to see what cultural competency first year pre-service teachers have as well as the cultural competency of students who are graduating. This would show pre-service teacher programs what their students are learning related to cultural competency. These studies could be used to improve teacher education programs by seeing what gaps exists and addressing these gaps in certain classes. Other ideas include examining the results of the survey using demographic data such as race, gender, parents' education, religion, or political preferences in order to identify demographic trends. One additional area of future research could include using the MASKS with in-service

teachers and then use the results to plan professional development opportunities based on survey results and findings.

This study set-out to create a valid and reliable survey instrument to measure the cultural competency of pre-service teachers. This research was grounded in Sue and Sue's Multicultural Competence Framework (2003) and followed strict survey development guidelines. Using exploratory factor analysis to determine construct validity, the end result was the new 54-item Multicultural Awareness, Skills, and Knowledge Survey. The survey started with three scales of *awareness*, *skills*, and *knowledge*. The final survey has seven a posteriori sub-scales; two for both *knowledge* and *skills*, and three for *awareness*. This survey can be used to help measure the cultural competency of pre-service teachers, and the results can inform programs of their strengths and gaps in their education preparation program.

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