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Psychometric Properties of Engagement in Cultural-related Diversity Experiences among Undergraduate Students in Malaysian Higher Education Institutions: A Confirmatory Factor Analysis

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Abstract

The purpose of this study was to examine the psychometric properties of the items used to measure engagement in cultural-related experiences among local undergraduate students in Malaysian higher education institutions (HEIs). Engagement in cultural-related experiences has two forms: informal cross-national interaction (ICNI) and curricular/ co-curricular diversity (CD). In determining the internal consistency and construct validity of the items, the Cronbach's alpha reliability analysis, exploratory factor analysis and confirmatory factor analysis were applied. The Cronbach's alpha values for both ICNI and CD models were good. The values indicated very good construct reliability and adequate convergent validity. This study suggested that the ICNI 10-items model and CD 6-items model have a good fit and shown good psychometric values.

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Keywords: Cultural-related diversity experiences; undergraduate students; Malaysia; higher education; Confirmatory factor analysis

1. Introduction

The demographic of students at higher education institutions worldwide have changed with the increasing number of students involved in cross-border education (CBE). According to Altbach, Reisberg, & Rumbley (2009), a total

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of 2.5 million students are pursuing higher education outside their home countries. It is estimated that the number will increase to 7 million by the year 2020. In Malaysian context, statistics has shown a high enrolment of international students into Malaysian higher education institutions (HEIs), particularly at private HEIs. With less than 2000 international students before the year 1995, currently Malaysia has 90,000 international students enrolled for both graduate and post-graduate programmes (Lim, 2011). According to the Institute of International Education, Malaysia is now tenth most-preferred study destination in the world (Lim, 2011). Aspired to be an international hub of education, Malaysia has planned to enrol 200,000 international students by the year 2020 as laid in the National Higher Education Strategic Plan for 2007-2020.

1.1. Research context

The increase in the number of international students in Malaysian HEIs implies that the campus will be more diverse, specifically in terms student racial composition. According to Leask (2009), a diverse campus is a valuable resource that can contribute positively towards students' educational outcomes. Drawing upon Allport's Contact Theory (1954), many studies have shown that contact with people from different cultural backgrounds can reduce prejudice and contribute positively towards many types of educational outcomes (Denson & Chang, 2008; Engberg, 2004; Gurin, Dey, Gurin, & Hurtado, 2002; Hurtado, S. & Ponjuan, 2005; Tamam & Abdullah, 2012). Diversity in higher education has three forms which are structural diversity, classroom diversity and informal interactional diversity (Bowman, 2011; Denson & Chang, 2008; Denson, 2009; Gurin et al., 2002; Tamam & Abdullah, 2012). *Structural diversity* refers to the numerical representation of students' diverse racial groups on campus. *Classroom diversity* (referred to as *curricular/co-curricular diversity* in this study) refers to the programmatic efforts undertaken by the HEIs in providing the platform for students to experience diverse cultures in the form of ideas and people. This includes interventions and curriculum such student enrolment into race relations classes and training. *Informal interactional diversity* refers to the informal interactions that occur among students of different cultural backgrounds, which are voluntary in nature. This can take place during social as well as sports activities. In this study *informal interactional diversity* is termed as *informal cross-national interaction* since the study intends to look at, specifically, the level of engagement in informal interaction between local, Malaysian students and the international students. In this study, cultural-related experiences have two forms: curricular/ co-curricular diversity and informal cross-national interaction.

In the context of higher education in Malaysia, a lot of studies have been carried out to examine cross-ethnic group interactions whose members typically exist in the same cultural context; however, few studies have looked at cross-national contact. According to Kamal & Maruyama (1990), cross-national interactions may well prove to be more complex than intra-national interactions. This is because people of the same country share, to a certain extent, common cultural symbols, language and citizenship. In light of this and the current demographic of students at HEIs, it is important and urgent to undertake studies on students' engagement in cultural-related experiences, especially those examining cross-national contact.

1.2. Research objectives

In undertaking such studies, valid and reliable items are fundamental to ensure that the items measure what they should measure. Therefore, the purpose of the study is to examine the psychometric properties of the items used to measure engagement in cultural-related experiences among local undergraduate students in Malaysian higher education institutions (HEIs). The items are assessed in terms of their reliability and validity. Based on the purpose of this study, two specific objectives are formulated:

- To examine the relevant psychometric properties of items measuring engagement in cultural-related experiences
- To determine the internal consistency and construct validity of the measurement for engagement in cultural-related experience

2. Method

2.1. Sampling and data collection procedure

A total of 1000 respondents were involved in the study. 54.6% of the respondents were female, 42.5% male and 2.9% did not indicate their gender. They were undergraduate students who were randomly selected from three higher education institutions in Klang Valley. 56.9% were in the age group of 19-21, 39.4% in the age group of 22-24 and 3.7% were 25 years old ($M = 21.37$, $SD = 1.62$). Corresponding to the age group, the respondents represented different semester of their study. 52.6% were in their first year, which included semester 1, 2 and 3; 39% in their second year, 6.9% in their third year and 0.8% in their fourth year of study ($M = 3.64$, $SD = 2.08$).

2.2. Measures

The items used to measure engagement in cultural-related experiences were adopted from past studies as stated in the following table.

Table 1: Items measuring cultural-related experiences and their sources

<i>Variables</i>	<i>Items</i>	<i>Source</i>
Engagement in Informal Cross-National Interaction	How frequent do you informally interact with international students in this campus?	Tamam & Abdullah (2012)
	How frequently have you dined with international students in this campus?	CIRP Database (of the Higher Education Research Institute at UCLA)
	How frequently do you socialize with international students?	CIRP Database (of the Higher Education Research Institute at UCLA) Denson & Chang (2009)
	How often do you make friends with international students?	CIRP Database (of the Higher Education Research Institute at UCLA) Denson & Chang (2009)
	How frequently have you had meaningful discussions about race relations outside of class with international students?	CIRP Database (of the Higher Education Research Institute at UCLA)
	How frequently have you shared a meal with international students?	CIRP Database (of the Higher Education Research Institute at UCLA) Denson & Chang (2009)
	How frequently do you share problems with international students in this university?	CIRP Database (of the Higher Education Research Institute at UCLA)
	How frequently do you have intellectual discussions outside of class with international students?	CIRP Database (of the Higher Education Research Institute at UCLA)
	How frequently do you study or prepare for class with international students?	CIRP Database (of the Higher Education Research Institute at UCLA)
Participation in Curricular/ Co-Curricular Diversity	How frequently do you have serious discussions with international students?	("College Student Experiences Questionnaire," n.d.) The College Student Experiences Questionnaire (CSEQ) Denson & Chang (2009)
	How frequently have you had guided interactions with international students in formal programmes?	CIRP Database (of the Higher Education Research Institute at UCLA)
	How frequently do you participate in activities or associations and societies, which had a mixed student membership in terms of their nationality?	Denson & Chang (2009) Tamam & Abdullah (2012)

How often do you get to do academic work in cooperation with international students?	Armfield (2004)
How frequently have you attended courses on racial relations and multiculturalism before?	Denson & Chang (2009)
How much exposure do you have in classes relating to information/activities devoted to the understanding of others from a different racial background?	Tamam & Abdullah (2012)
How much opportunity do you have to engage in contact and interaction with international students in your classes?	Tamam & Abdullah (2012)

Since some of the items were developed and used in the Western, individualistic context, a pilot test was carried out to examine the applicability of the items in Malaysian, collectivistic context. Cronbach's alpha for informal cross-national interaction was 0.914, suggesting very good internal consistency reliability. The Cronbach's alpha value for curricular/ co-curricular diversity, on the other hand, was 0.765.

The items were then subject to Exploratory Factor Analysis (EFA) using SPSS 18.0 to examine the dimensionality of the items. Items with factor loading lower than 0.5 were dropped. One item each was dropped from the variables due to low factor loading. To test for validity and to confirm unidimensionality, the items were then subject to Confirmatory Factor Analysis (CFA) using Analysis of Moments Structures (Amos) software.

3. Results

Table 2 shows the fit indices of ICNI model, for both the initial and fit model. The 10-items model had a good fit with the latent constructs ($X^2/df = 4.836$, $p = 0.000$, $RMSEA = 0.062$, $GFI = 0.976$, $AGFI = 0.949$, $CFI = 0.988$, $TLI = 0.979$, $NFI = 0.985$). The Cronbach's alpha value of ICNI was 0.945 and the Average Variance Extracted value was 0.78.

Table 2: Goodness-of-fit Indices and Factor Loading for Informal Cross-National Interaction

Fit Indices	Initial Model (n=1000)	After "Free Estimate" (n=1000)	Recommended Value
Chi-Square	849.32	125.73	-
Degrees of freedom	35	26	-
χ^2/df	24.27	4.836	Equal or below 5.00
RMSEA	0.153	0.062	Equal or below 0.08
GFI	0.833	0.976	Equal or above 0.90
CFI	0.900	0.988	Equal or above 0.90
Factor Loading		0.683, 0.763, 0.769, 0.771, 0.723, 0.779, 0.787, 0.862, 0.841, 0.838	Equal or above 0.30
Reliability		0.945	Equal or above 0.70
AVE		0.78	Equal or above 0.50

Table 3 shows the fit indices of CD model, for both the initial and fit model. The confirmatory factor analysis for CD model with six items showed a good fit with the latent constructs ($X^2/df = 2.721$, $p = 0.012$, $RMSEA = 0.042$, $GFI = 0.995$, $AGFI = 0.981$, $CFI = 0.995$, $TLI = 0.988$, $NFI = 0.993$). The Cronbach's alpha value of CD was 0.831 and the Average Variance Extracted value was 0.655.

Table 3: Goodness-of-fit Indices and Factor Loading for Curricular/ Co-Curricular Diversity

Fit Indices	Initial Model (n=1000)	After "Free Estimate" (n=1000)	Recommended Value
Chi-Square	187.645	16.325	-
Degrees of freedom	9	6	-
χ^2/df	20.849	2.721	Equal or below 5.00
RMSEA	0.141	0.042	Equal or below 0.08
GFI	0.941	0.995	Equal or above 0.90
CFI	0.920	0.995	Equal or above 0.90
Factor Loading		0.765, 0.795, 0.772, 0.464, 0.525, 0.610	Equal or above 0.30
Reliability		0.831	Equal or above 0.70
AVE		0.655	Equal or above 0.50

4. Discussion

The objective of this study was to examine the items used to measure cultural-related diversity experiences in terms of their internal consistency and construct validity. The confirmatory factor analysis showed the final ICNI model with 10 items and CD model with 6 items had a good fit of constructs as all the goodness of fit indices support the model fit. The ten items and six items were well loaded as all the items had loading factors of more than 0.5; this finding showed that both ICNI and CD had valid constructs. This study provides evidence to support the validity of the inventory where it measures what it should measure. Therefore, both ICNI and CD are valid tools to be utilized to examine students' engagement in cultural-related diversity experiences. The findings also show some consistencies with earlier measurement from the research undertaken by Tamam and Abdullah (2012) and Denson and Chang (2009). The reliability analysis suggested that both ICNI and CD demonstrated a measure of high internal consistency with a value of more than 0.80. Both the ICNI 10-items and CD 6-items had also shown a good construct reliability and adequate convergent validity as the Composite Reliability and EVA values were more than 0.6; this was another important finding to show its construct reliability.

5. Conclusion

In conclusion, these findings provide substantial amount of evidence to conclude that the both ICNI 10-items and CD 6-items are reliable instruments that could be used to examine students' engagement in cultural-related experiences.

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