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Looking at Filipino Pre-service Teachers' Value for Education through Epistemological Beliefs about Learning and Asian Values

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The present study investigated the contribution of epistemological beliefs about learning and Asian values on pre-service teachers' value for education. The relationship of epistemological beliefs and valuing education is based on Schwartz and Bilsky's (1987; 1990) theory of human values. The participants were 362 pre-service teachers from different universities in Manila, Philippines. It was found in a standard regression analysis that both complexity and structured belief about learning significantly predicted valuing one's education. Higher expectation for achievement, filial piety, and emotional restraint were also significant. A hierarchical multiple regression was used to test the order of contribution of Asian values (filial piety, hierarchical family structure, collectivism, emotional restraint, perseverance and hard work, higher expectation for achievement, respect for authority, and respect for education) on valuing education. The results showed that the order of Asian values based on the theory of Schwartz and Bardi (2001) significantly explained the variation on valuing education (Adjusted R^2=.35). The contribution of each Asian value increased the variation on valuing education but it remained stable with the inclusion of respect for education and respect for authority.

Keywords: Epistemological beliefs, Asian values, value for education

Students value their education when they believe that learning is valuable. Like other Asians, Filipinos have high regard for education because it is an integral part of their values orientation. Valuing education is the belief that schoolwork is both interesting and important. Voelkl (1997) included the recognition of the value of school both as a social norm and as a tool for facilitating personal advancement. She further elaborated that value for education is "regard for school as a central institution in society and [a student] feels what is learned in class is important and that school is instrumental in obtaining his or her personal life objectives" (p. 296). Value for education in the present study is assessed among pre-service teachers as learners. Students who value their education include the school as part of their definition.

Valuing for education among Filipinos is rooted in their adherence to Asian cultural values (Salvador, Omizo, & Kim, 1997). The values held by Asians as part of their culture complement their achievement-driven attitudes (Asakawa & Csikszentmihalyi, 1998; Eaton & Dembo, 1997; Fox, 1991; Heggins & Jackson, 2003; Liang,

Tracy, Kauh, Taylor, & Williams, 2006; Lynn, 1991). Asian values, which include competencies focused on intellectual achievement, emotional discipline, and high regard for the family, contribute greatly to value for education (Kodama, McEwen, Liang, & Lee, 2001). These factors serve as terminal values to explain students' value for education (Shwartz & Bilsky, 1987; 1990).

Epistemological beliefs affect a myriad of variables pertaining to learning, such as ways and results of learning (Bauer, Festner, Gruber, Harteis, & Heid, 2004), achievement goals and cognitive engagement (Ravindran, Greene, & DeBacker, 2005), learning approach and academic performance (Cano, 2005; Chan, 2003; Kizilgunes, Tekkayam & Sunger, 2009), and conceptions of teaching and learning (Wong, Chan, & Lai, 2009). It is apparent that these factors manifest some aspects that define value for education. Value for one's education is defined by Voelkl (1997) as appreciation of success in school-relevant goals. Students value their education when they see school as (1) a tool for facilitating personal development and (2) important and instrumental in obtaining their personal life objectives. Mastery goals, cognitive engagement, deep approach to learning, high academic performance, and active role of students in the conception of learning are all facilitative of personal development and obtaining objectives.

Goodenow (1993) demonstrated in her study that students' value for their education (belonging and psychological membership in school) is influenced by several personal traits. One of these personal traits can be their epistemological beliefs about learning. This indicates that beliefs about learning can be used to predict value for education. The relationship between epistemological beliefs and valuing education occurs when individuals hold mature beliefs about learning and knowledge which makes them value education. More specifically, students that allow their learning to be critiqued and improved have more appreciation of their success in achieving school-related goals. Likewise, students who place importance on organization, precision, and certainty in their learning are more likely to experience a sense of success.

In the present study, Asian values and epistemological beliefs are used as predictors of valuing education. These variables are based on Schwartz and Bilsky's (1987; 1990) theory of human values. Three features of the theory are tested in the present study. First, the study includes value typologies as terminal and instrumental. The Asian values as predictors serve as terminal values while valuing education serve as the instrumental value. Schwartz and Bilsky (1987) in describing the theory specifically noted that "the impacts of values as independent variables on attitudes can be predicted, identified, and interpreted more effectively and reliably" (p. 550). Second, the theory combines the concept of values with beliefs as a primary feature. This combination of concepts is justified by studying together epistemological beliefs with Asian values and valuing education. Third, the theory indicates that values are "ordered by relative importance" (Schwartz & Bilsky, 1987, p.551; Schwartz & Bilsky, 1990, p. 878; Schwartz & Bardi, 2001). Testing Asian values and epistemological beliefs ordered by their relative contribution in predicting valuing education using a hierarchical regression is appropriate because hierarchy of values exist for every society (see Schwartz & Bardi, 2001).

Asian Values

Montgomery (1997) characterized Asian values as strongly evident in the family and community that tends to be more stable across situations. For example, Kim, Atkinson, and Yang (1999) found that Asian values are stable even among first and second generation Asian-Americans who are already enculturated in Western practices. This was also demonstrated by Liang and Sedlacek (2003) when they conducted factor analysis on the needs of Asian students. Moreover, the study of Yeh, Carter, and Pieterse (2004) found strong correlations of racial identity measures with cultural values among Asians. Asian values strongly explain the performance of students in the educational

setting because of their sense of value for education (Sue & Okazaki, 1990).

It is shown in different studies that Asian students, when compared to their Caucasian counterparts, perform well in school (Flynn, 1991; Lynn, 1994; Neisser et al., 1996). Their achievement is explained by their specific Asian values such as hard work, perseverance, and diligence that allow them to do well in school and in academic-related tasks (Knafo & Schwarts, 2003). Kodama, McEwen, Liang, and Lee (2001) further explained that Asian learners excel in schools because their traditional Asian values have significant implications on their scholastic development and experience. They showed that Asian values such as interdependence with the family, maintaining interpersonal harmony, emotional restraint, academic/economic-based definition of success, collectivism, respect for elders, and deference to authority essentially contribute to success in school. Asians value hard work and high achievement which is rooted in their value for education. Authority figures also play a central role in the learning process of Asian students (Sung, 1995). Students respect their teachers and value their education because it is essential to harmonize their relations between one generation and another (as in the student and teacher relationship) (Chen, 1986; Shea & Yeh, 2008). This harmony is characterized by Asian learners giving credit to their family and home in their educational performance; in return, the parents' central duty is to instill in their children a positive attitude towards school (Hess, Chang, & McDevitt, 1987).

Different studies indicate that Asian values allow Asians to perform better in situations that involve self-development (Kim & Atkinson, 2002; Kim, Li, & Liang, 2002; Liang, Tracy, Kauh, Taylor, & Williams, 2006; Lowe, 2005; Shea & Yeh, 2008). Asakawa and Csikszentmihalyi (1998) showed in their study specific reasons for the academic excellence manifested by Asian students. They found in their analysis that "Asian American adolescents reported relatively positive experiences when they were engaged in activities highly valued in their cultures. When engaged in activities perceived to be more like work, they were significantly happier, reported enjoying themselves more, and felt better about themselves than their Caucasian American counterparts" (p. 163). Positive outcomes in school situations occur because of their high regard for education which is consistent with their values (Sue & Okazaki, 1990).

Epistemological Beliefs

Epistemological beliefs are also related to value for education. There are some studies that indicate the close relationship of epistemological beliefs and value for education in other domains. These studies were conducted in the context of science education, religion, and agriculture. For example, the study by Staley (2007) examines the role of pragmatic concerns in statements of epistemological group beliefs, focusing on scientific collaborations that are constituted in part by the aim of evaluating the evidence for scientific claims through evidential collaborations in a particle physics class. He concluded that applying social epistemological considerations to scientific collaborations is practical and beneficial in a classroom context. The study by Peeters (2007) demonstrated that the relationship between epistemological beliefs regarding religion and science is a source of value. The study was not conducted in an educational context, but the relationship between epistemological beliefs and value for education was apparent. The results indicated that the participants' epistemological beliefs were more critically evaluative if their values are not consistent with the issue. In a similar fashion, Kuhn and Park (2005) hypothesized that intellectual values, defined as the extent to which intellectual engagement is regarded as worthwhile to the group's interests, are supported by an epistemological belief system. They found that developing mature epistemological understanding is a key to intrinsically value intellectual engagement.

The closest study which explained epistemological beliefs and value for education was

that of Knobloch (2008). It was found that teachers' epistemological beliefs were related to their adoption and integration of topics and activities that would enrich student learning in their classrooms. Measures of enriching student learning in the classroom utilized in the study are highly descriptive of valuing education. In particular, their belief of the need to include the study of food, agriculture, and natural resources in elementary classrooms can bring about learning regarding life. The adjustment of having a more functional approach in the classroom and changing it to make it more realistic is a complex form of epistemological belief.

The most widely used measure for epistemological beliefs was constructed by Schommer (1990). She conceptualized epistemological beliefs as multidimensional and domain-independent (Schommer, 1990). The measure was originally composed of five schemes with the following underlying dimensions: Simple knowledge, certain knowledge, omniscient authority, innate ability, and quick learning. After conducting factor analysis in succeeding studies, Schommer came up with with four factors of epistemological beliefs: Innate ability, simple knowledge, quick learning, and certain knowledge (Schommer, 1990; Schommer, 1993). Succeeding studies were able to maintain the same four factor structure of epistemological beliefs (Schommer, 1998; Schommer, Calvert, Gariglietti, & Bajaj, 1997); however, Schommer-Aikins, Mau, Brookhart, and Hutter (2000) used Confirmatory Factor Analysis and found a three-factor structure of epistemological beliefs to be more appropriate for middle school students. The three factors include: Stability of knowledge, speed of learning, and ability to learn. When the four factors of epistemological beliefs were studied among Asian samples, different patterns emerged. For example, Chan and Elliot (2000) used the original five schemes among 352 Hong Kong teacher education students and arrived at a three-factor structure of the scale following varimax and oblimin rotation. The factors retained were fixed ability and quick learning (factor 1), omniscient authority, certain knowledge, and some components of quick learning (factor 2), and ability to learn and avoid ambiguities. It is apparent that omniscient authority was included among the highly loaded components because Asian culture acknowledges experts as the authority in their learning. This indicates that the subscales of epistemological beliefs are different for Asian samples. Chan and Elliot (2002) in another study extracted four factors of the epistemological beliefs scale using teacher education students in Hong Kong. The four factors were renamed and items were revised to fit the experiences relevant to an Asian sample. The renamed four factors were: Innate/fixed ability, learning effort/process, authority/expert knowledge, and certainty knowledge. The factors of epistemological beliefs in the study by Chan and Elliot (2002) were confirmed in the study by Wong, Chan, and Lai (2009). The same four factor model of epistemological beliefs was used and had acceptable fit using a sample of preservice teachers in Hong Kong. Youn, Yang, and Choi (2001), with a Korean sample, used the items of Schomer's Epistemological beliefs and extracted two factors: Learning (innate ability and quick learning) and knowledge (certainty, omniscient authority, orderly process). The knowledge factor significantly predicted independent self-construal. The study of Bernardo (2008) tested different factor structures of epistemological beliefs and found that a two-factor structure was best fitted for Filipino pre-service teachers. These two factors are: Simple learning and structured learning (combination of quick and fixed abilty). Bernardo's (2009) study then renamed the two factors of epistemological beliefs to: Complexity of learning and structure of learning. The complexity of learning is the belief that "learning is a complex process that can be critiqued, further improved and elaborated" (p. 165). The other end of the continuum for complexity is simple learning ["belief that learning is bare, elementary, and uncomplicated process" (p. 165)]. On the other hand, structured learning is the belief "about the importance of organization, precision, and certainty in the learning process" (p. 165). The other end of the continuum for structure

indicates that "learning is loose, inexact, and even ambiguous process" (p. 165). The present study used the two-factor structure of epistemological beliefs by Bernardo (2008, 2009) because it is appropriate for the sample used in the study which is composed of Filipino pre-service teachers.

Teacher Education in the Philippines

In the Philippine setting, the teacher education curriculum is a degree course taken in higher education for four years (for schools structured in two semester per year). The curriculum of teacher education in the Philippines was reformed in 2004 to improve the quality of the teaching of the future generation of teachers in the Philippines. The new education curriculum emphasizes teachers having more functional skills related to teaching and learning (Bernardo, 2007a). The enhanced curriculum allows the pre-service teachers to improve several competencies required for higher learning. The professional education courses were designed to integrate theory, method, and experience in the curriculum (see Bernardo, 2007b).

The Present Study

The present study used both epistemological beliefs (complexity and structure of learning) and Asian values (higher expectation for achievement, respect for education, perseverance and hard work, respect for authority, hierarchical family structure, filial piety, emotional restraint, and collectivism) together to predict value for education among Filipino pre-service teachers, grounded in the human values theory of Schwartz and Bilsky (1987; 1990).

In the present study, values and beliefs are arranged according to their relative contribution to valuing education using a hierarchical regression. Entering Asian values and epistemological beliefs in order is justifiable because by nature, values are arranged according to hierarchy (Schwartz & Bardi, 2001). The theory of human values by Schwartz and Bilsky (1987; 1990) emphasize that values are arranged according to relative importance. These value priorities reflect differences in genetic heritage, personal experiences, social locations, and enculturation. Different groups of people vary substantially on the importance they give to their attribution of values. It is appropriate to use values and beliefs in an ordered sequence because it provides information on certain value priorities among Filipino pre-service teachers. The order of value system proposed by Schwartz and Bardi (2001) indicate commonalities among college students in 54 nations. Their study found that college Filipino students have an alternative way of ordering values as opposed to the African, American, and European samples. The hierarchy of values by Schwartz and Bardi (2001) matched the Asian values by Kim, Atkinson, and Yang (1999) as shown in Table 1.

The present study looked into the consistency between the order of Asian values with the more general class of values ordered by Schwartz and Bardi (2001) in their theory. The order of Asian values is studied using a hierarchical regression is further justified in the following according to Schwartz and Bardi (2001): (1) The Asian values hierarchy is an explanation of why particular values are more or less socially desirable for Filipinos; (2) If order of values and beliefs are identified, it promotes and preserves cooperative and supportive relations among members of the group; And (3) individuals can easily adapt to one's group if they know what is valued by their group.

METHOD

Participants

The participants in the study were 362 Filipino college students taking up different courses in a teacher education program (educational psychology, secondary/elementary education, special education, early childhood education, science education). All the participants started their education courses in college with the revised

Table 1
Value Hierarchies of Pan-Cultural Teacher Norms with Corresponding Asian Values

Rank	Value	Description	Asian Values
1	Benevolence	Preservation and enhancement of the welfare of people with whom one is in frequent personal contact	Filial pietyHierarchical family structure
2	Self-direction	Independent thought and action choosing, creating, exploring	
3	Universalism	Understanding, appreciation, tolerance and protection for the welfare of all people	—
4	Security	Safety, harmony, stability of society, of relationship, and of self	Collectivism
5	Conformity	Restraint of action, inclinations, and impulses likely to upset or harm others and violate social expectations or norms	Emotional restraint
6	Achievement	Personal success through demonstration of competence according to social standards	Perseverance and hard work Higher expectation for achievement
7	Hedonism	Pleasure and sensuous gratification for oneself	
8	Tradition	Respect, commitment, and acceptance of the customs and ideas that traditional culture or religion provides the self	Respect for authorityRespect for education
9	Stimulation	Excitement, novelty, and challenge in life	—
10	Power	Social status and prestige, control or dominance over people and resources	

Note. — no corresponding Asian value

teacher education curriculum. The participants came from five colleges and universities in the National Capital Region in the Philippines. The ages of the participants range from 17 to 18 years old. Age was limited to 17-18 because epistemological beliefs are said to change within specific age groups (Schommer, 1998).

Instruments

Schommer Epistemological Questionnaire (SEQ). The SEQ was used in the study to measure the participants' epistemological beliefs on learning. The 17 items in a two-factor structure were used in the present study because they are appropriate for Filipino pre-service teachers (Bernardo, 2008). The factor on complexity of learning is composed of 10 items and structure of learning with 7 items. The items were answered by participants in a five-point Likert scale (1- strongly disagree, 2-disagree, 3–Neutral, 4-Agree, 5-Strongly Agree). High scores on complexity of learning indicate a complex belief of learning while low scores indicate a belief of learning as a simple process. For structure of learning, high scores indicate that learning is structured while low scores indicate that learning is loose and flexible (Bernardo, 2009). The relationship between complexity and structure of learning reflects the features of the Philippine educational system (Bernardo, 2008). This two-

factor structure was derived using Confirmatory Factor Analysis (CFA) which was tested against a five-factor, four-factor, three-factor, and one-factor measurement model of epistemological beliefs. The two-factor model turned out to be the best fitting model for both Filipino and English versions (χ^2/df=1.63, *RNI*=.91, *TLI*=.91, *RMSEA*=.04). Complexity and structure of learning that is structured as a common factor model (two latent variables that are correlated) was replicated in the present study and adequate fit was also obtained (see Appendix A). All items as manifest variables for each latent factor obtained significant paths. The goodness of fit measures were adequate as indicated by χ^2/df=.73, *RMSEA*=.06, *PGI*=.95, *Joreskog GFI*=.92, *AIC*=.92. Using the data in the present study, the relationship of both complexity and structure of learning had a positive direction which is significant (.67). Moreover, internal consistencies of the items indicated by Cronbach's alpha was .73 for complexity of learning and .70 for structure of learning.

Asian Values Scale (AVS). The 25-item version of the Asian Values Scale was used in the study (Kim & Hong, 2004). The items depict Asian values in the areas of deference to authority figures, hierarchical family structure, filial piety, emotional restraint, conformity to norms, collectivism, and humility. The first version of the scale by Kim, Atkinson, and Yang (1999) extracted six factors with 36 items having high factor loadings (above .40). Subsequent studies still proved the six factors underlying a second order CFA. Because it underlies a single latent construct in its first order CFA, a unidimensional scale, was assessed using a one-parameter Rasch model which resulted in 25 items that have good fit. These 25 items were used in the present study because they remained to fit the one-parameter Rasch model in subsequent studies (Hong, Kim, & Wolfe, 2005). In the present study, the Asian values needed to be reconfigured because they aimed to determine specific Asian values that would predict value for education. A Principal Components Analysis with varimax rotation was conducted to determine the underlying specific factors of Asian values (see Appendix B). There were eight factors extracted with eigenvalues of greater than 1.0. These factors were labeled based on the original factors of Kim, Atkinson, and Yang (1999): Emotional restraint (6 items), collectivism (5 items), filial piety (5 items), higher expectation for achievement (4 items), respect for authority (2 items), respect for education (1 item), perseverance and hard work (1 item), hierarchical family structure (1 item) with explained variance of 16.02%, 9.91%, 6.77%, 5.82%, 5.52%, 4.87%, 4.33%, and 4.10% respectively. The last three factors containing single items were retained because their removal will tremendously affect the internal consistency and item fit (one parameter IRT) of the entire scale. Having single items as a measure of subscale is supported by the multidimensional item response theory which posits that "a single item can be representative of a strong indicator of the domains measured or even a variety of abilities" (Antal, 2007, p. 292). To assess the functionality of the 25 items, the procedure of Kim and Hong (2004) was replicated using a one-parameter Rasch Model. The response format of the current scale is a four-point Lickert scale (1-strongly disagree, 2-disagree, 3-agree, 4-strongly agree). Having a four point Lickert type is considered as a continuous scale because the length of the scale still represents the degree and amount of Asian values measured (Alreck & Settle, 2004; Netemeyer, Bearden, & Sharma, 2003). For the analysis of the items, the response format for each item was recoded into a dichotomy (0=strongly disagree/disagree, 1=agree/strongly agree) to make the items monotonic to produce logit values as a requirement in the procedure for the Rasch model analysis. This procedure is necessary because "in analysis of dichotomous items, item difficulty and person ability are defined such that when they are equal, there is a 50% chance of a correct response" (Kim, Atkinson, & Yang, 1999, p. 198; Wright & Masters, 1982). The dichotomous scale was only entered for the Rasch model analysis but the four-point Likert scale was used in the multiple regression analysis. All the 25

items turned out to have a good fit based on the MNSQ values (within .8 to 1.2) and Z standard scores (values below 2.00 are acceptable). Using the IRT approach, two sets of reliability were obtained: Person reliability was .72 and item reliability was .94. These reliability values indicate that person characteristics remained to be consistent for all 362 participants and the responses for the 25 items were consistent as well.

Identification with School Questionnaire (ISQ). The ISQ was originally composed of 16 items and the subscale on valuing of education is a 7-item subscale for the factor belongingness in school (Voelkl, 1997). The response format for each item is a Likert scale that ranged from (1) strongly disagree to (4) strongly agree. The participants were instructed to respond to the items as learners. Previous studies used *CFA* for the 16 items and resulted in two factors (belongingness in school and valuing of school) with adequate fit. Correlation of the two underlying factors is high (.85). Voelkl (1997) recommended that researchers could choose one dimension or two based on their theoretical design. This prior Confirmatory Factor Analysis showed that the whole scale can be represented by a single factor. The reported coefficient-alpha reliability for the scale is .84. To examine the functional characteristics of the items as a single dimension, the one-parameter Rasch model was used in the present study (see Appendix C). In the same way as with the AVS, the response format for the 7 items was recoded in a dichotomous format. All items result to have good fit with *MNSQ* values within .80 to 1.2, and *Z* values below 2.00. Item reliability was .97 but person reliability is .32 indicating a wide variation of responses per person.

Procedure

There were three sets of questionnaires provided for those participants who were willing to participate in the study. During administration, the participants were reminded that there were no right and wrong answers, to answer as honestly as possible, not to leave any items unanswered, and to take their time in answering. After completing the items, the participants were debriefed about the purpose of the study.

The total scores of the SEQ, AVS, and measure for valuing education were transformed into standard *z* scores to equalize differences in their scale length (Downie & Heath, 1984). A standard multiple regression was conducted where the factors of epistemological beliefs and Asian values were used to predict value for education. In another analysis, a hierarchical multiple regression was used because the order of the values were already determined based on the hierarchy of values by Schwartz and Bardi (2001).

RESULTS

In the first analysis, each factor of epistemological beliefs and Asian values was used to predict valuing education using a standard multiple regression analysis. In another analysis, hierarchical multiple regression was used where filial piety and hierarchical family structure was entered as the first set of predictors. This was followed by collectivism, emotional restraint, perseverance and hard work, higher expectation for achievement, and respect for authority and education the last.

The standard multiple regression analysis showed that in predicting valuing education, both complexity (β=.25) and structure (β=.10) epistemological beliefs were significant. For Asian values, higher expectation for achievement (β=.23), filial piety (β=.16), and emotional restraint (β=.15) were significant. Complexity and higher expectation for achievement largely contributes to valuing education. The predictors taken together to predict valuing education was significant with sufficient explained variance (R=.66, R^2=.43). Epistemological beliefs and Asian values as predictors explain valuing education well (Adjusted R^2=.42).

Table 2
Standard Multiple Regression Predicting Value for Education

	B	***t***	***p***
Complexity	0.25***	5.26	0.00
Structure	0.10*	2.07	0.04
Higher Expectation for Achievement	0.23***	4.87	0.00
Respect for Education	0.08	1.80	0.07
Perseverance and Hard work	0.09	1.85	0.07
Respect for Authority	0.03	0.66	0.51
Hierarchical Family Structure	0.07	1.51	0.13
Filial Piety	0.16**	3.21	0.00
Emotional Restraint	0.15**	2.80	0.01
Collectivism	0.01	0.17	0.87

*p<.05, **p<.01, ***p<.001

The Asian values were entered in order based on the hierarchy of values by Schwartz and Bardi (2001) using hierarchical multiple regression in predicting Asian values. The hierarchical regression showed that there was a significant increase in the explained variance for valuing education when emotional restraint was added with hierarchical family structure, filial piety, and collectivism (R=.54, R^2=.30, Adjusted R^2=0.28). There was also a significant increase in the explained variance for valuing education when perseverance and hard work, and higher expectation for achievement were added as a predictors (R=.60, R^2=.36, Adjusted R^2=.35). However, there was no change in the variance explaining value for education when respect for authority and respect for education were added as predictors. Hierarchical family structure had a significant contribution to valuing education when the effect of emotional restraint, perseverance and hard work, higher expectation for achievement, respect for authority, and respect for education were controlled. The final order (step 5) of the Asian values in predicting valuing education had an adequate explained variance (Adjusted R^2=.35).

DISCUSSION

It was found in the study that complexity and structure of learning, higher expectation for achievement, filial piety, and emotional restraint taken together best explains valuing education. Both epistemological beliefs, complexity and structure of learning turned out to significantly increase valuing education in the standard regression analysis. It was also found that the ordered factors of Asian values explain valuing education well. The present study expands the literature by further examining the ordered effects of Asian values and putting together epistemological beliefs and Asian values to explain valuing education.

Complexity and structured beliefs about learning significantly predicted valuing education in the analysis. This result supports previous studies showing the relationship between epistemological beliefs and value for education (Knobloch, 2008; Kuhn & Park, 2005; Peeters, 2007; Staley, 2007). Complexity of learning in predicting value for education means that students see education as valuable when they believe that learning can be

Table 3
Hierarchical Regression Predicting Value for Education

Order		Beta	t	SE	R	R^2	Adjusted R^2
1	Hierarchical Family Structure	0.12**	2.63	0.01	.48***	.23	0.23
	Filial Piety	0.47***	10.04	0.00			
2	Hierarchical Family Structure	0.11*	2.36	0.02	.50***	.25	0.24
	Filial Piety	0.41***	8.04	0.00			
	Collectivism	0.15***	2.90	0.00			
3	Hierarchical Family Structure	0.08	1.72	0.09	.54***	.30	0.28
	Filial Piety	0.30***	5.73	0.00			
	Collectivism	0.07	1.32	0.19			
	Emotional Restraint	0.27***	5	0.00			
4	Hierarchical Family Structure	0.01	0.21	0.83	.60***	.36	0.35
	Filial Piety	0.23***	4.39	0.00			
	Collectivism	0.05	1.10	0.27			
	Emotional Restraint	0.22***	4.10	0.00			
	Perseverance and Hard work	0.09	1.88	0.06			
	Higher Expectation for Achievement	0.24***	4.95	0.00			
5	Hierarchical Family Structure	-0.001	-0.02	0.99	.60***	.36	0.35
	Filial Piety	0.23***	4.43	0.00			
	Collectivism	0.05	0.90	0.37			
	Emotional Restraint	0.20***	3.74	0.00			
	Perseverance and Hard work	0.09	1.73	0.08			
	Higher Expectation for Achievement	0.23***	4.67	0.00			
	Respect for Authority	0.001	0.02	0.99			
	Respect for Education	0.06	1.33	0.19			

*p<.05, **p<.01, ***p<.001

critiqued, further improved, and elaborated. The pre-service teachers, as the sample of the study, know that education emphasizes a thorough understanding about the concept of learning. Their thorough understanding of the nature of learning includes their belief about the complexity of the learning process. Being open to change and their willingness to improve their learning is also indicative that they value their education. They are open to be evaluated in order to improve. This belief is possible because education is valuable for them. This is typical when a pre-service teacher

demonstrates teaching with a group of students and is later evaluated by the teaching supervisor. The pre-service teacher manifests an open attitude towards the evaluation process because of his willingness to improve his performance. Part of having a complex belief in learning is the "value for a course in study skills." This means that students are open to acquiring further study skills for improvement. This aspect has a similarity with valuing education which is typical among Asians. The intention to acquire further study skills is a manifestation of the value given for education in general. The same is true for the aspect of complexity on "learning how to learn." The belief on learning how to learn shows the value for learning as a key element to master specific tasks. This means that students should continue to look for ways to acquire information because this adds to one's repertoire of skills. Students continue to acquire skills because of the value they place on education. The aspects of complexity of learning such as openness to evaluation, value for study skills, and continued acquisition of ways to learn are manifested as pre-service teachers value their education. This relationship is explained through the pre-service teachers' formation in their education curriculum. The formation of teachers undertaking the reformed teacher education program in the Philippines developed a complex way of viewing the learning process. This complex view of learning is developed in understanding the integration of theory, method, and experience (see Bernardo, 2007b).

On the other hand, structure of learning also significantly predicted value for education. Pre-service teachers value their education more when they think about the importance of organization, precision, and certainty of the learning process. This shows that the tendency to view learning as structured makes learners (pre-service teachers) focus on structuring their learning and consequences of their learning such as value for education. Belief about the structure learning is manifested through knowing the best methods, careful work, specificity of facts, eliminating distractions, meticulous organization, and having definite answers. A positive affect about the importance of education is expected if the process of learning facilitates organization. Students who are directed to the right track, precise answers, best methods, and specific facts become more appreciative of their learning and consequently value their education. Pre-service teachers who benefit from the consequences of structured beliefs are able to see the value of education more.

Previous studies showing the relationship between epistemological beliefs and value for education are limited. The studies only show how epistemological beliefs can be beneficial in some aspects of valuing education. The contribution of a complex and structured beliefs of learning on value for education directs a system of learning. This system of learning operates by showing: (1) how advantageous the formation of complex and structured beliefs of learning is to valuing education in general; (2) how the transformation of perspectives in viewing learning needs to be complex and structured to attain the value of improving learning; and (3) the indicators of development among pre-service teachers through the quality of curriculum exposed especially in the Philippine setting.

The Asian values that were significant such as filial piety, higher expectation for achievement, emotional restraint indicate theoretical consistency with valuing education (Hess, Chang, & McDevitt, 1987; Kodama, McEwen, Liang, & Lee, 2001; Shea & Yeh, 2008; Sue & Okazaki, 1990). These Asian values account for the influence of both the family socialization which is inclusive in filial piety and personal development that encompasses higher expectation for achievement, and emotional restraint. This result describes Asian cultural values promoting high regard for education through family socialization and personal development.

Excellence, achievement, and mastery in the academic setting are expected and valued by Asians. The outcome of these high expectations in school is valued by the students and they consequently value their education more. Students are commonly expected by their parents to get high scores in tests, pass board exams, and be included

in the list of honor students. The child exerts effort to meet these standards because it is valued in the family. The sense of achievement the child receives upon meeting the standards makes them view education as valuable.

Filial piety as a significant predictor of valuing education indicates that the family and the kind of socialization that occurs in the family is a mechanism for seeing education as an integral part of their life. This is demonstrated when major decisions need to be made about the child's education and the whole family is concerned. The child who is a recipient of education respects the decision of the family especially the elders when it comes to matters about school. For example, parents decide what school to enroll the child in, what course in college the child will take, the kind of company the child keeps in school, and to some extent the extra-curricular activities the child engages in. Whatever the family decides for the child, the child in turn lives with these decisions made by the parents that are consistent with family values and orientation. The child is expected to live by the parents' ideals because disobedience is not valued. The way the parents see the importance of education is also seen by the child as important. For Filipinos, valuing of education through filial piety reflects parents' view that education is part of a legacy that they leave to their children (Li, 2000; Salvador, Omizo, & Kim, 1997). Because of this orientation, the child continues to value the legacy of education provided by the parents by exerting effort and working hard in school. The higher expectation for achievement accounts largely in explaining valuing education through the excellence exerted by students in school. This standard is expected by the family, teachers, and peers to be maintained. Deviation from the standards creates a bad conception about the student.

Emotional restraint as an Asian value also explains valuing education. Emotional restraint can be a form of self-control and self-discipline that makes individuals regulate their actions. This kind of behavior is valuable for Asians because it facilitates positive relationship and harmony with others (Youn, Yang, Choi, 2001). In the school context, the students restrain themselves from answering back to authority figures, show positive reactions even when their work is critiqued, and have a courteous attitude when speaking with teachers. This formation of restraining one's emotion is valued to facilitate harmony and organization in school which a student values. This is demonstrated when students restrain themselves from smoking, bringing deadly weapons, cheating during exams, and displaying intimate affection for a partner within the school grounds. These restraints are facilitated within the school community because of students' value for education.

The Asian values, specifically higher expectation for achievement, filial piety, and emotional restraint, are relevant in the school and educational context because of their contribution to valuing education. Filipinos value their education because it is part of their values orientation as Asians. Valuing education is coherent with what is valued in the family and what one values. This coherence puts education as an important priority in their development. This scenario is true among Filipino pre-service teachers (Agbayani-Siewert, 1994; Cimmarusti, 1996; Salazar, Schludermann, Schludermann, & Huynh, 2000; Guanzon-Lapena, Church, Carlota, & Katigbak, 1998). They are taking a degree in teacher education because of their high value for education.

The findings do not only show which Asian values and epistemological beliefs explain valuing education but also a configuration illustrating the order of Asian values. Specifically, the hierarchical regression indicates that the ordered Asian values largely accounts for the variation in valuing education. The variation in valuing education remained stable when respect for education and respect for authority were included as predictors. The order of the contribution of predictors shows the importance of how each Asian value explains value for education. The order found in the study are consistent with the hierarchy of values found by Schwartz and Bardi (2001) only for filial piety, emotional restraint, and higher expectation for

achievement which were found to be significant. Filial piety having the largest contribution, followed by emotional restraint, and higher expectation for achievement indicates that these Asian values play important aspects in explaining how individuals value education. These Asian values belong to the class of benevolence, conformity, and achievement values which are the top three in Schwartz and Bardi's theory. The values function to form cooperative and supportive social relations. The role of the family and parents, and expectations from others dictate majority of school related events. Parents' regard for education is consistently shared by the child. To maintain this value, the child exerts effort to maintain expectations.

The present study did not only show the order of individual Asian values. There is some form of compatibility having both epistemological beliefs and Asian values together to explain valuing education given that it had a larger explaining power (Adjusted R^2=.42) than Asian values alone to predict valuing education (Adjusted R^2=.35). This compatibility opens the possibility of further theorizing that epistemological beliefs and Asian values function in an integrated mechanism. This means that epistemological values are best studied together with Asian values. This is especially true in the formation of pre-service teachers because their beliefs and values explain much of their value for education.

The present study extends theory on epistemological beliefs by studying it together with Asian values as predictors. The findings in the study found higher explained variance when epistemological beliefs are combined with Asian values to predict valuing education. This provides a perspective that aside from one's cultural values, personal epistemologies also play an important role in explaining why pre-service teachers value their education. It further extends theory by allowing other school-relevant variables to be viewed as outcome of one's epistemological beliefs (such as valuing one's education). The findings specifically point out that epistemological beliefs play a role in the development of one's sense of regard for education.

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Appendix A

CFA for the Factors of Epistemological Beliefs

	Parameter Estimate	SE
Latent variable: Complex Learning		
A course in study skills would probably be valuable.	0.32***	0.06
The most successful people have discovered how to improve their ability to learn.	0.57***	0.06
If I find the time to re-read a textbook chapter, I get a lot more out of it the second time.	0.51***	0.06
Students have a lot of control over how much they can get out of a textbook.	0.37***	0.06
Everyone needs to learn how to learn.	0.66***	0.06
Wisdom is not knowing the answers, but knowing how to find the answers.	0.56***	0.06
If a person can't understand something within a short amount of time, they should keep on trying.	0.66***	0.06
You should evaluate the accuracy of information in a textbook, if you are familiar with the topic.	0.70***	0.06
Often, even advice from experts should be questioned.	0.39***	0.07
Students who are "average" in school will remain "average" for the rest of their lives.	1.00	
Latent variable: Structured Learning		
A good teacher's job is to keep his students from wandering from the right track.	0.42***	0.06
The most important aspect of scientific work is precise measurement and careful work.	0.55***	0.06
Educators should know by now which is the best method, lectures or small group discussions.	0.55***	0.06
When I study, I look for the specific facts.	0.49***	0.06
Usually you can figure out difficult concepts if you eliminate all outside distractions and really concentrate.	0.44***	0.06
I really appreciate instructors who organize their lectures meticulously and then stick to their plan.	0.55***	0.07
The best thing about science courses is that most problems have only one right answer.	0.38***	0.07
(structure)↔(complex)	0.67***	0.05

Note. Complex and structure are latent variables, the items indicated are manifest variables.
***p<.001, χ^2/df=.73, *RMSEA*=.06, *PGI*=.95, *Joreskog GFI*=.92, *AIC*=.92

Appendix B

Factor Loadings and Item Fit of the AVS

	Factor Loadings								INFIT	
	F1	F2	F3	F4	F5	F6	F7	F8	MNSQ	Z
Modesty is an important quality of a person	.58								.99	-.06
One should have sufficient inner resources to resolve emotional problems	.68								1.05	.67
One need not remain reserved and tranquil*	.72								1.05	1.27
One should be humble and modest	.41								1.04	.64
One need not be able to resolve psychological problems on one's own*	.63								.95	-1.24
One need not control one's expression of emotion*	.57								1.02	.64
One should not make waves		.42							.93	-1.64
One should not deviate from familial or social norms.		.46							.92	-1.60
When one receives a gift, one should reciprocate a gift of equal or greater value.		.48							.99	-.15
One should consider the needs of others before consider one's own needs.		.71							.89	-2.03
One should think about one's group before himself.		.52							.91	-1.55
Children should not place their parents in retirement homes.			.79						.96	-.53
One should avoid bringing displeasure to one's ancestors.			.62						.99	-.16
The worst thing that one can do is to bring disgrace to one's family reputation			.78						1.04	.88
Occupational failure does not bring shame to the family*			.51						1.06	1.51
Family's reputation is not the primary social concern.			.49						.97	-.71
One should be discouraged from talking about one's accomplishments*				.77					1.10	2.38
One need not achieve academically in order to make one's parent proud*				.55					1.07	1.72
One need not minimize or depreciate one's own achievement*				.71					1.14	3.60
One's achievement should be viewed as Family's achievements.				.63					1.02	.34
Younger persons should be able to confront their elders*					.67				.97	-.76
One should be able to question a person in authority*					.55				.98	-.67
Educational and career achievements need not be one's top priority*						.73			.96	-1.06
One need not focus all energies on one's studies*							.56		.89	-1.98
One need not follow the role expectations (gender, family hierarchy) of one's family*								.48	1.04	.96

Note. Explained variance 16.02% (F1=Emotional Restraint), 9.91% (F2=Collectivism), 6.77% (F3=Filial Piety), 5.82% (F4=Higher Expectation for Achievement), 5.52% (F5=Respect for Authority), 4.87% (F6=Respect for Education), 4.33% (F7=Perseverance and Hard work), 4.10% (F8=Hierarchical Family Structure). Acceptable MNSQ for item fit is within 0.8-1.2, Acceptable Z fit is below 2.00 (Pomeranz, Byers, Moorhouse, Velozo, & Spitznagel, 2008).

* Reversed scoring