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Profession-Specific Values, Beliefs, and Norms on Environmentalism: The Case of Teaching Disaster Risk Reduction*

Ian Phil CANLAS, Mageswary KARPUDEWAN*****

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ABSTRACT

In the context of Value-Belief-Norm Theory, a prior study revealed that the teaching of disaster risk reduction in existing school curricula is a form of pro-environmental behavior. However, there is limited if any that explored profession-specific values, beliefs, and norms on environmentalism. This paper reports a finding of a study about the possible existence of a distinct profession-specific values, beliefs, and norms in teaching disaster risk reduction. Following a two-phase cross-sectional survey design, 434 public school science teachers from Biliran Province, the Philippines answered an adapted, modified, and content validated questionnaire. Data collected underwent exploratory factor analysis and parallel analysis to determine the initial factor structure and confirmatory factor analysis to confirm the same. Results revealed the existence of distinct profession-specific values, beliefs, and norms in teaching disaster risk reduction that may have implications for environmentalism since schools are at the forefront of many environmental advocacies including environmental awareness, protection, and sustainability.

Keywords: Value-Belief-Norm Theory; profession-specific values, beliefs, and norms; disaster risk reduction; environmentalism; pro-environmental behavior

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1. INTRODUCTION

The increasing call for sustainable development has, directly and indirectly, mandated the different sectors of society, such as all levels of the education sector, to proactively consider advocacies and actions related thereto, including environmentalism. Behaviorally, environmentalism is defined as "the propensity to take actions with pro-environmental intent (Stern, 2000, p.411)". Along this line, an earlier study by the researcher revealed that "certain teacher behaviors/activities lie within the continuum of pro-environmental behavior, such as integrating and teaching disaster risk reduction (DRR) in science (Canlas & Karpudewan, 2021)." While this may not be surprising, its implication for teaching and learning goes beyond, considering that schools are often are at the forefront of many environmental advocacies, including environmental awareness, protection, and sustainability, among others. In fact, the literature has also identified ways in which schools may be involved in environmental education. For example, Badurek and Jimenez (2022) suggested promoting dialogue on the educational implications of climate change and societal impact, which may include environmental degradation. A study by Laffitte and colleagues (2022) suggested actively engaging parents and encouraging their interactions with schools in environmental education activity preparations. Early on, a study by Kuzovkina (2010) and Sangsupata (2006) suggested introducing a new interdisciplinary subject or creating a local curriculum. In the Philippines, it must be noted that there are pieces of evidence of environmentalism in existing school curricula, such as the science curriculum of the K to 12 program, for instance (DepEd, 2016). That being so, the role of teachers in integrating and teaching environmentalism is imperative.

Related thereto, values, beliefs, and norms are major behavioral variables that are well-studied and established in the literature on teaching and learning (Biesta et al., 2015) and pro-environmental behavior (Stern et al., 1999). However, exploring the values, beliefs, and norms related to teaching using the lens of environmentalism is limited. This paper presents one emerging findings of a study that explored the influence of values, beliefs, and norms on teaching DRR among public school science teachers in Biliran Province, the Philippines, using the Value-Belief-Norm Theory of environmentalism (i.e., referred to as Value-

** Assistant Professor of Science, Department of Mathematics and Natural Sciences, School of Arts and Sciences, University of Central Asia, Naryn, Kyrgyz Republic. e-mail: lordphil2003@gmail.com, ian.canlas@ucentralasia.org (ORCID: 0000-0003-0056-3340)

*** Professor, School of Educational Studies, Universiti Sains Malaysia, Penang, Malaysia. e-mail: kmageswary@usm.my (ORCID: 0000-0001-8669-504X)

Belief-Norm Theory in the latter part of the paper) as a theoretical lens. The preliminary exploratory factor analysis during the early part of the study resulted in the further splitting of values, beliefs, and norms on teaching DRR beyond what was stipulated in the theory, which prompted the researcher to explore the phenomenon further. Specifically, the paper presents empirical evidence on the existence of profession-specific values, beliefs, and norms on teaching DRR that are significantly distinct from values, beliefs, and norms on general disaster risk reduction.

The foregoing study is deemed necessary since, without clear, detailed, and systematic guidelines for integration and teaching of DRR in existing school curricula, its occurrence and frequency are generally left to the prerogative of the teachers; therefore, may be influenced by their respective values, beliefs, and norms thereto related. Whilst the study was limited to the integration and teaching of DRR in science and the selected locale particularly, considering that DRR lies within the auspices of environmentalism (Moos et al., 2018), the above-mentioned may also be true for many more pro-environmental teacher behaviors/activities, as well as other islands and regions that experience similar natural hazards (ASEAN, 2013). In that, strengthening profession-specific values, beliefs, and norms towards pro-environmental teacher behaviors/activities is imperative. Such intervention may result in teachers proactively and aggressively looking for opportunities to integrate and teach environmental advocacies and, therefore, increase the occurrence and frequency of its integration and teaching. Synthesized from the findings, the latter part of the paper reflects profession-specific values, beliefs, and norms on environmentalism.

1.1. Values, Beliefs, Norms, and Teaching

Biesta and colleagues (2015) pointed out that teacher agency, that is, the "ability of the teachers to make informed classroom and professional development decisions (Seipel et al., 2019)", is highly dependent on teachers' personal qualities and knowledge base (e.g., professional knowledge and skills) including their values, beliefs, and norms towards the teaching profession and their teaching respectively. Anchored in existing behavioral theories (e.g., Theory of Planned Behavior, Theory of Reasoned Action, Norm-Activation Theory), values, beliefs, and norms in teaching have been researched and explored extensively. In the work of Maaranen and colleagues (2019) on what is important to teacher educators in Finland, they found three important themes, including (a) personal aspects that relate to values and enthusiasm, (b) beliefs about the importance of their work, their subject/specialization, and research-based teacher education, and (c) community which includes students, interaction, and collaboration, all of which are somewhat related to norms.

Schwartz (2012) defined values as "(a) concepts or beliefs, (b) pertain to desirable states or behaviors, (c) transcend specific situations, (d) guide selection or evaluation of behavior and events, and (5) are ordered by relative importance" (p.4). These are abstract ideas that "contribute to decision-making capabilities, framing attitudes, and leading to engagement with specific actions; influencing behavior indirectly by directing the attention of an individual to the information that they value and influencing their perception of the said information (Schwartz, 2012)".

Along this line, years of research revealed that teachers' values explain their perception of and responses to challenges (Wray & Richmond, 2018) and influence students' learning, critical thinking, and values (Low et al., 2017). Moreover, teachers' values were also associated with their respective classroom goals, including academic, performance approach, social, and mastery goals (Pudelko & Boon, 2014). In short, teachers' values drive their professional goals and behavior at school and support their well-being and beliefs (Barni et al., 2018).

Meanwhile, belief is a "proposition that may be consciously or unconsciously held, is evaluative in that it is accepted as true by the individual, and is therefore imbued with emotive commitment, it serves as a guide to thought and behavior (Borg, 2001, p.186)". In teaching, beliefs are related to self-efficacy. Rooted in the work of Bandura, self-efficacy refers to teachers' beliefs in their ability to effectively handle tasks, obligations, and challenges in teaching, which plays a key role in student achievement, teachers' motivation, and well-being (Barni et al., 2018). It includes "beliefs about children and young people, beliefs about teaching, as well as, beliefs about educational purpose (Biesta et al., 2015)".

Literature showed that teachers' beliefs contribute to the development of their professional visions, teacher-student interaction, and the implementation of differentiated instruction (Keppens et al., 2021). Moreover, teachers' beliefs determine their level of confidence and competence to engage with tasks (Lemon & Garvis, 2015). In addition, teachers' beliefs were found to correlate with commitment (Zee & Koomen, 2016). Lastly, teachers' beliefs were also found to have positive links with students' academic adjustments, teacher behavior patterns, classroom quality practices, and factors underlying teacher psychological well-being, including personal accomplishments and job satisfaction (Zee & Koomen, 2016).

Moving on, norms represent "a set of rules and beliefs on how to act in a particular situation (Schwartz, 2012)". It refers to the "principles, rules, or cognitive heuristics in evaluating and prescribing behavior and experienced as feelings of moral obligation (Schwartz & Howard, 1981)". Research has revealed that norms may become a barrier in teaching, such as teaching evolution (Tolman et al., 2021) or teaching higher-order thinking skills (Assaly & Jabarin, 2021). Moreover, norms influenced teachers' use of teaching platforms (Tang et al., 2021) and curriculum development (Villegas-Mateos et al., 2021). Lastly, norms were a significant predictor of willingness to teach, such as willingness to teach cancer (Heuckmann et al., 2020).

In a study published elsewhere, the researcher explored and found that science teachers' values, beliefs, and norms on teaching DRR conform to the Value-Belief-Norm Theory, confirming that certain teacher behaviours/activities lie within the continuum of pro-environmental behaviour (Canlas & Karpudewan, 2021). That being so, it may be meaningful to move one step further, that is to explore profession-specific values, beliefs, and norms on teaching DRR, which may have important implications for increased frequency and voluntary integration and teaching of environmentalism in existing school curricula.

1.2. Value-Belief-Norm Theory

The Value-Belief-Norm Theory explicates the interplay of values, beliefs, and norms on pro-environmental behaviour. Its postulates were initially proposed by Stern and colleagues (Stern et al., 1999) in a study that attempted to combine Value Theory and Norm Activation Theory that originated from the works of Schwartz (1992), as well as the New Environmental Paradigm founded by Dunlap and Van Lierre (1978). Stern and colleagues (1999) claimed that 'individuals who accept movement's basic values, belief that valued objects are threatened and believed that their actions can help restore those values experience an obligation for pro-movement action that creates a predisposition to provide support; the particular type of support that results are dependent on the individual's capabilities and constraints (p.81)'.

Figure 1 illustrates the linear relationship of values, beliefs, norms, and pro-environmental behaviour as postulated by Stern and colleagues (1999). It shows that values and beliefs are higher-order constructs formed by "altruistic values (AV), biospheric values (BV), egoistic values (EV), and openness to change (OC)," as well as "awareness of consequences (AC) and ascription to responsibility (AR)," respectively. While the original theory accounted only for personal norms (PN), some recent studies on pro-environmental behaviour considered and included the influence of social norms (SN) on pro-environmental behaviour (Ghazali et al., 2019).

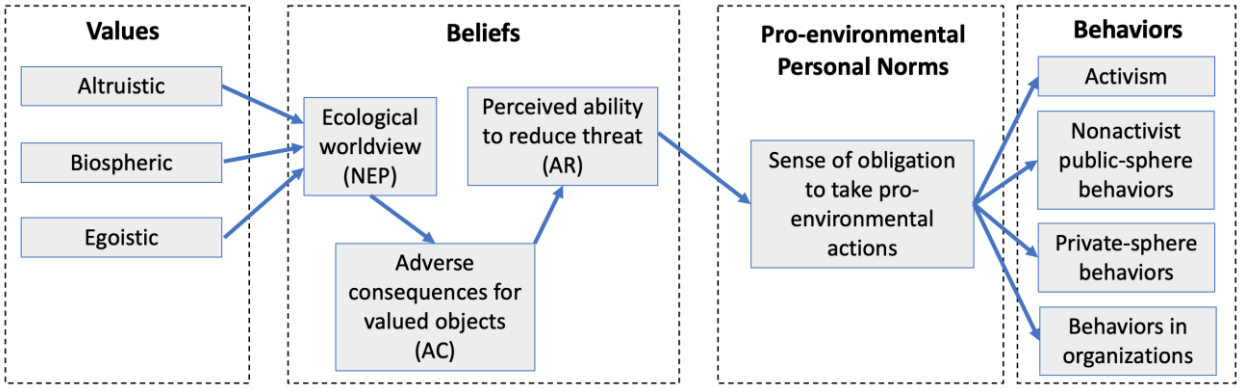

Figure 1. Illustrative diagram of Value-Belief-Norm Theory (adapted from Stern, 2000)

First-order constructs of values as conceptualized as follows: (a) AV refers to "values that reflect the concern for the welfare of other people or their well-being (Stern 2000)", (b) BV refers to the "feeling of being concerned for the biosphere including other non-human species; caring for nature and the environment (Steg & De Groot 2012)", (c) EV refers to the "values that reflect the individual's concern for the environment for their own sake and self-interest (Steg & De Groot 2012)", and (d) OC refers to "stimulation and self-direction based on the motivation of independent thought and action (Stern et al. 1999)". Meanwhile, for the first-order constructs of beliefs, AC refers to "adverse consequences for the objects valued or the belief that environmental circumstances will improve to benefit everyone or deteriorate to harm everyone, including other living species (Stern et al. 1999; Stern 2000)", while AR refers to the "perceived ability to reduce threat; the belief that individual's action can promote or prevent potential negative impact to the environment (Stern et al. 1999; Stern 2000)". Along with norms, PN refers to the "feeling of moral obligation to protect and preserve the environment (Kiatkawsin & Han, 2017)", while SN refers to the "social pressures that individual experiences from significant others or society at large to engage in a specific behaviour (Ghazali et al., 2019)".

Among the different dimensions of pro-environmental behaviour postulated by Stern and colleagues (1999) and Stern (2000) include (a) environmental activism, that is, active involvement in organizations and demonstrations; (b) non-activist behaviours in the public sphere, such as making petition on an environmental issue, contributing to organizations, support and or acceptance of policies; (c) private sphere environmentalism such as purchase, use, and disposal of personal and household products; and (d) other environmentally-significant behaviours like influencing actions of organizations, among others. Through the years, scholars have adopted different terminologies for pro-environmental behaviour, such as environmentally-relevant behaviour (Steg & De Groot 2012) or environmentally-friendly behaviour (van Riper & Kyle, 2014). Some studies adopted general thematic terminologies, such as green purchase behaviour (Quoquab et al., 2020), or specific thematic terminologies, such as climate-conserving behaviour (Karpudewan, 2019), among others.

1.3. Purpose of the Study

This paper presents one of the emerging findings of a study that explored the influence of values, beliefs, and norms on teaching DRR. The Value-Belief-Norm Theory, as a theoretical lens, the paper reported the components and determinant indicators of profession-specific values, beliefs, and norms on teaching DRR. Synthesized from the findings, the paper reflected environmentalism and profession-specific values, beliefs, and norms.

2. METHODOLOGY

The foregoing study followed the cross-sectional survey design divided into two phases: the exploration phase (Phase 1) and the confirmation phase (Phase 2).

2.1. Locale and Participants

The study locale was Biliran Province, Philippines. Due to its geographical location and composition, the island province experiences an elevated risk of meteorological-climatic and geo-seismic hazards year-round (Province of Biliran, 2011). The island is composed of eight towns: Almeria, Biliran, Cabucgayan, Caibiran, Culaba, Kawayan, the island town of Maripipi, and the capital town of Naval. It has one division of the Department of Education (DepEd) that supervises all public schools (i.e., elementary and high schools) within the province, the DepEd Division of Biliran.

Participating schools were randomly selected from a total of 148 schools through a raffle. Cluster sampling was employed in selecting the participants since all science teachers from the schools drawn teaching between grades 3 to 10 were asked to participate in the study voluntarily.

To determine whether the number of participants was sufficient for analysis, the gamma exponential method using the G*Power calculator, which is available online, was employed. Considering the following parameters F test family, linear multiple regression, fixed model, R^2 deviation from zero, 0.83 level of power, 0.2 effect size (f^2) at significance level $p < 0.05$, and 11 predictors, the study required at least 100 participants (Hair et al., 2014).

Figure 2 shows the relevant demographic characteristics of the participants for Phases 1 and 2 of the study.

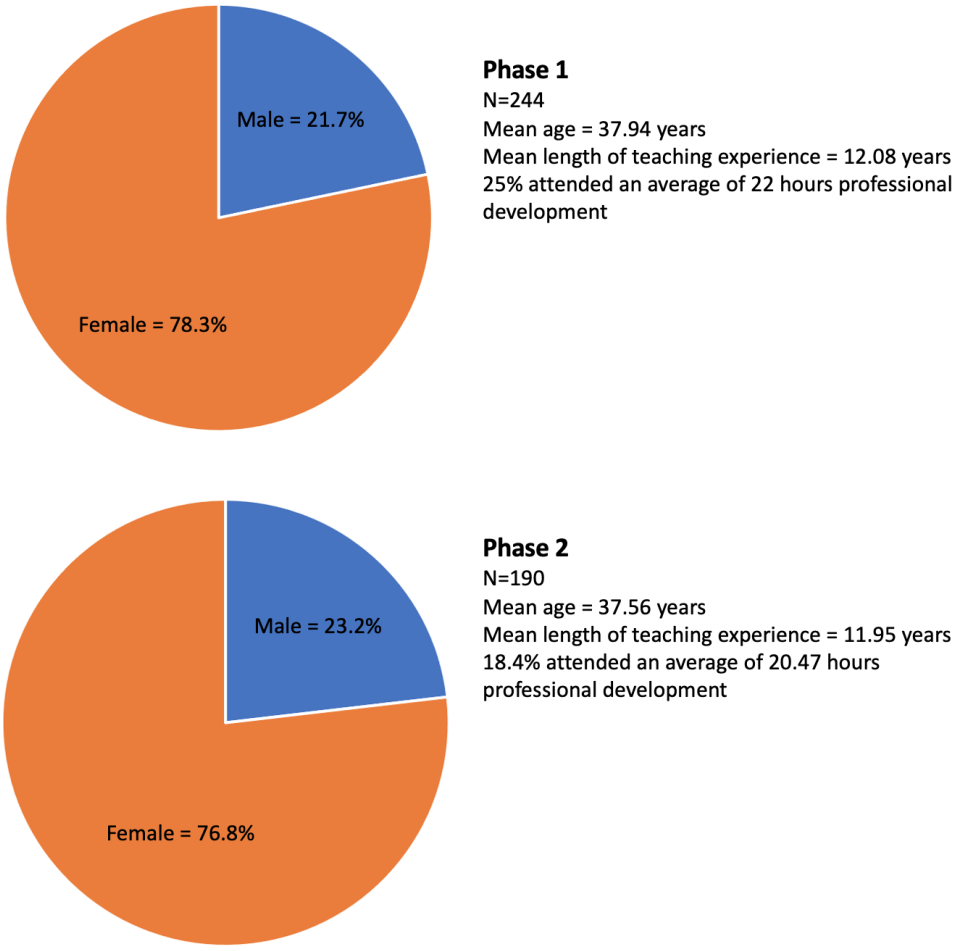

Figure 2. Demographic Distribution of Participants

2.2. Instrument

2.2.1. Item selection and content validation

The initial item pool was 69, adapted from Stern and colleagues (1999), Ghazali and colleagues (2019), Kiatkawsin and Han (2017), and Yadav and Pathak (2017). AV has 10 items, BV has five, EV has six, OC has 13, AC has seven, AR has six, PN has 10, and SN has 12. Six experts, three DRR coordinators (master's degree holders) from another Dep-Ed division, and three science education specialists (doctorate holders) from a teacher education university validated the initial item pool. This ensures the relevance of the items to the study context.

Polit and Beck (2006) suggested measuring the item-content validity index (I-CVI) and scale-content validity index (S-CVI). Calculated I-CVI and S-CVI/Ave ranged from 0.83 to 1.00 and 0.94 to 1.00 respectively. That being so, the content validity of the items was affirmed. The final 5-point Likert scale instrument for Phase 1 comprised 64 items – nine for AV, five for BV, six for EV, 13 for OC, seven for AC, six for AR, nine for PN, and nine for SN.

2.3. Data collection and analysis

The printed questionnaire was distributed between November and December 2019 (Phase 1) and May and June 2020 (Phase 2). A total of 300 questionnaires were distributed to 52 schools in Phase 1. 260 questionnaires were retrieved however, only 244 were considered for exploratory factor analysis after data cleaning (i.e., removing entries of those who missed the checkpoint items and entries that left 5% of the total items unanswered, (Tabachnick & Fidell, 2019)). Meanwhile, 224 questionnaires were distributed to 49 schools in Phase 2, of which 205 were retrieved, and 190 were considered for confirmatory factor analysis after data cleaning.

2.3.1. Exploratory factor analysis and parallel analysis

Phase 1 of the study was primarily focused on ascertaining the factor structure of the instrument through exploratory factor analysis using Statistical Package for Social Sciences (SPSS). It implemented common factor analysis or principal axis factoring to assess the sources of common variation instead of focusing on explaining the amount of variance since its result is said to be "more generalizable in the confirmatory factor analysis (Carpenter, 2018, p.36)." PROMAX rotation was specified since it is argued to be "more robust as it begins with an orthogonal solution and then transforms it into an oblique solution (Carpenter, 2018, p.39)." Among the parameters examined during this phase include the (a) Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy to ascertain the adequacy of participants in the study, (b) Bartlett's test of sphericity to ascertain that the correlation matrix is different from the identity matrix, (c) factor loadings to ascertain item reliability, (d) Cronbach's alpha to ascertain convergent validity, (e) pattern matrix to ascertain the factor structure, and (f) percent of variance explained of the first-order constructs. Tabachnick and Fidell (2019) suggested retaining factors with eigenvalues of ≥ 1.0 and excluding items with loading values of <0.50 and items with cross-loadings. To further verify the factor structure established, a parallel analysis was also conducted (Hayton et al., 2004).

2.3.2. Confirmatory factor analysis

Maximum likelihood method in SPSS AMOS, was used for confirmatory factor analysis of data collected in Phase 2 to confirm the factor structure established in Phase 1. A separate correlated model for each group of first-order constructs that make up the second-order construct was used for analysis (i.e., the first model for values was made up of AV, BV, OCA, and OCB, a second model for beliefs was made up of ACA, ACB, and AR, a third model for norms was made up of PN, SNA, and SNB). The process allowed the researcher to examine and account for the variance of each first-order construct that makes up a second-order construct. The first part of the analysis examined the item reliability by examining the outer loading, the convergent validity by examining the average variance extracted (AVE) and composite reliability, and variances, as well as discriminant validity by examining the squared correlation estimates (<AVE).

Note that Hu and Bentler (1999) suggested examining Chi-square (x^2) (the smaller, the better), degrees of freedom (*df*), p-value, x^2/df ($<x^2/df<10$), incremental fit index (IFI) (≥ .95), Tucker-Lewis index (TLI) (≥ 0.90), comparative fit index CFI (≥ 0.95), goodness-of-fit (GFI) (≥ 0.90), adjusted goodness-of-fit index (AGFI) (≥ 0.90), standardized root-mean-square residual (SRMR) (≤ .08), and root-mean-square error of approximation (RMSEA) (<0.06) to ascertain model fit.

3. RESULTS

3.1. Phase 1 (exploratory phase)

The calculated KMO measure of sampling adequacy was marvelous (KMO = .915), and Bartlett's test of sphericity result (Approx. Chi-Square = 14828.582; df = 2016; p < .001) ascertained that the correlation matrix has significant correlations among at least some of the variables, therefore doing exploratory factor analysis with Phase 1 data is sensible (Hair et al., 2014).

Table 1 summarizes the results of exploratory factor analysis and parallel analysis, respectively. All items have factor loadings greater than the threshold of 0.40 and 0.45 for 200 and 150 participants, respectively (Hair et al., 2014, p.115), confirming individual item reliability. Moreover, Cronbach's alpha values were adequate for ACB, ACA, and OCA, the bare minimum for AV-A, BV, EV, OCB, PN, SNA, and SNB, while desirable for AR (Nunnally & Bernstein, 1994, p.265), therefore ascertaining convergent validity. AV-B did not have an acceptable Cronbach's alpha value; hence, the said construct was eliminated during this phase.

Moving on, eigenvalues of factors ≥ 1.0 were the ones retained (Tabachnick & Fidell, 2019). The five factors of values, three factors of beliefs, and three factors of norms accounted for 18.98, 38.56, and 14. 95 percent of cumulative variance explained respectively.

To supplement the rigor of exploratory factor analysis, parallel analysis was also performed. Results showed that all the constructs whose eigenvalues were ≥ 1.0 in exploratory factor analysis possessed means that were less than the percentile, confirming the factor structure established (Hayton et al., 2004).

3.2. Phase 2 (confirmatory phase)

The results of the confirmatory factor analysis in Phase 2 are shown in Table 2. All standardized loading estimates exceeded the ideal threshold of 0.70 except ACA3 and ACB2. Nevertheless, the two items were retained since the values were greater than the 0.50 conservative threshold (p.618), confirming individual item reliability. All the five retained dimensions have AVEs within the threshold of >0.50 (p.618-619), as well as the composite reliability threshold of 0.70, ascertaining convergent validity (Hair et al., 2014).

The squared correlation estimates between and among the first-order constructs of values, beliefs, and norms showed that they were all significantly less than the AVE (Hair et al., 2014, p.620), therefore confirming discriminant validity.

Table 3 shows the calculated values of model fit parameters of values, beliefs, and norms. Remarkably, all values were within the established thresholds, confirming a satisfactory model fit for each model of values, beliefs, and norms, respectively.

Table 1.
Model fit

Parameters	**Thresholds**	**Model fit**		
		Values	**Beliefs**	**Norms**
x^2	The smaller the better	282.772	170.927	105.952
df		139	81	61
p		<.001	<.001	<.001
x^2/df	*(<x^2/df<10*	2.034	2.11	1.737
Incremental fit index (IFI)	≥0.95	.951	.964	.975
Tucker-Lewis index (TLI)	≥0.90	.939	.953	.968
Comparative fit index (CFI)	≥0.95	.95	.964	.975
Standardized Root-mean square residual (SRMR)	≤0.08	.016	.017	.020
Root-mean square error of approximation (RMSEA)	<0.06	.074	.077	.062

Table 2.
Exploratory analysis results

Dimensions/items	Mean	Standard Deviation	Exploratory factor analysis: Cronbach's alpha	Factors (loadings) 1	2	3	4	5	6	Eigenvalue (% of variance)	Parallel analysis: Means	Percentile
AV-A			0.911							2.990	1.262143	1.317408
AV1	4.4549	.66203		.711								
AV2	4.5533	.57488		.940								
AV3	4.2869	.66641		.856								
AV4	4.4467	.66142		.651								
AV5	4.6434	.55176		.567								
AV-B			0.587							1.730	0.988727	1.025347
AV7	4.6967	.55019			.445							
AV8	4.4139	.74589			.573							
AV9	3.6639	.93060			.412							
BV			0.922							5.328	1.457158	1.52374
BV1	4.5369	.65630				.673						
BV2	4.5861	.59210				.776						
BV3	4.6762	.57170				.812						
BV4	4.7295	.52957				1.001						
BV5	4.7418	.51613				.985						
EV			0.913							2.295	1.162278	1.22185
EV1	4.3607	.64234					.929					
EV2	4.3115	.65523					.936					
EV3	4.2828	.64625					.668					
OC-A			0.881							4.872	1.385246	1.458216
OC2	3.6721	.71368						.787				
OC3	3.4549	.73284						.934				
OC4	3.6967	.64648						.893				
OC5	3.7910	.66152						.675				
EV5	4.3607	.64234						.800				
OC-B			0.914							3.495	1.32739	1.393315
OC8	4.2828	.67124							.628			
OC9	4.1598	.65031							.657			
OC11	4.1967	.61046							.966			
OC12	4.2295	.59195							.926			
OC13	3.8730	.69407							.700			
OC14	4.1230	.61635							.903			

Table 2.
Continuation

Dimensions/items	Mean	Standard Deviation	Cronbach's alpha	Exploratory factor analysis: Factors (loadings) 1	2	3	4	5	6	Eigenvalue (% of variance)	Parallel analysis: Means	Percentile
AC-A			0.886							1.932	1.069757	1.10866
AC1	4.6189	.52725		.804								
AC2	4.6311	.50022		.906								
AC4	4.5246	.56965		.508								
AC-B			0.801							2.015	1.112339	1.163733
AC5	4.0615	.83661			.680							
AC6	4.0369	.77158			.716							
AC7	4.0000	.76444			.831							
AR			0.961							34.611	1.641998	1.73987
AR1	4.2418	.64385				.795						
AR2	4.2295	.61913				.952						
AR3	4.2049	.62114				.984						
AR4	4.2008	.59199				.997						
AR5	4.1844	.60417				.940						
AR6	4.1926	.60160				.987						
PN1	4.1885	.61305				.653						
PN2	4.1762	.62664				.591						
PN3	4.2336	.60070				.535						
PN4	4.3975	.58948				.500						
PN			0.940							2.735	1.209897	1.263159
PN5	4.3156	.60417					.644					
PN6	4.2254	.59698					.656					
PN7	4.2295	.59195					.811					
PN8	4.2500	.58002					.688					
PN9	4.2541	.61613					.808					
SN-A			0.906							10.388	1.533751	1.605514
SN1	3.9754	.61481						.635				
SN2	4.0123	.62514						.753				
SN3	4.0287	.63764						.594				
SN4	4.0656	.58426						.822				
SN5	4.1967	.62380						.799				
SN6	4.1270	.61216						.631				
SN-B			0.939							1.826	1.026167	1.06593
SN7	3.8893	.70276							.826			
SN8	3.8934	.66428							.838			
SN9	3.8893	.67894							.793			

Table 3.
Results of confirmatory factor analysis

Dimensions/items	Outer loading	CR	Variances			AVE	Squared correlation estimates				
			Estimate	S.E.	C.R.		AV	BV	EV	OCA	OCB
AV		.872	.112	0.018	6.146	.630		.461	.320	.020	.235
AV1	.746										
AV2	.870										
AV4	.773										
AV5	.780										
BV		.948	.170	0.018	9.195	.860			.190	.007	.166
BV3	.819										
BV4	.978										
BV5	.976										
EV		.914	.285	0.040	7.044	.780				.139	.391
EV1	.894										
EV2	.909										
EV3	.845										
OCA		.866	.240	0.037	6.520	.619					.178
OCA1	.737										
OCA2	.696										
OCA3	.883										
OCA4	.818										
OCB		.906	.214	0.034	6.288	.659					
OCB1	.800										
OCB2	.764										
OCB3	.841										
OCB4	.855										
OCB6	.795										

Table 3.
Continuation

Dimensions/items	Outer loading	CR	Variances			AVE	Squared correlation estimates		
Beliefs			**Estimate**	**S.E.**	**C.R.**		**ACA**	**ACB**	**AR**
ACA		.708	.136	0.028	4.876	.876		.117	.203
ACA1	.865								
ACA2	.978								
ACA3	.648								
ACB		.812	.429	0.065	6.642	.594			.099
ACB1	.747								
ACB2	.651								
ACB3	.895								
AR		.956	.238	0.032	7.425	.710			
AR1	.751								
AR2	.821								
AR3	.856								
AR4	.907								
AR5	.859								
AR6	.896								
AR7	.866								
AR8	.805								
AR9	.809								
Norms							PN	SNA	SNB
PN		.915	.170	0.026	6.448	.684		.247	.271
PN1	.725								
PN2	.736								
PN3	.930								
PN4	.928								
PN5	.792								
SNA		.891	.190	0.033	5.702	.621			.445
SNA1	.727								
SNA2	.807								
SNA3	.851								
SNA4	.812								
SNA6	.737								
SNB		.910	.263	0.041	6.395				
SNB1	.907								
SNB2	.930								
SNB3	.791								

4. DISCUSSIONS

This study confirms the existence of profession-specific values, beliefs, and norms on teaching DRR that are considerably distinct from values, beliefs, and norms on general DRR. Table 4 shows the items that describe the different retained first-order constructs of values, beliefs, and norms on teaching DRR.

Table 4.
Specific items that manifest AV, BV, EV, WI, and WF in teaching DRR

Constructs	Items
AV	• "Along with disaster risk reduction, I believe in equal opportunity for all." • "Civil unrest should be avoided before, during, and after a disaster." • "Justice should be maintained before, during, and after a disaster." • "Children should be given extra care before, during, and after a disaster." • "The order should be maintained before, during, and after a disaster."
BV	• "Natural resources should be protected from all kinds of disasters." • "We should live in harmony with other species." • "Our actions should not hurt nature." • "We should take the initiative in preserving the environment." • "We should take initiatives in protecting nature."
EV	• "My teaching of disaster risk reduction can impact the lives of my students." • "My teaching of disaster risk reduction can minimize disaster risks." • "My teaching of disaster risk reduction can impact the life of the family of my students."
OCA (WI)	• "I am creative enough in teaching disaster risk reduction." • "I have sufficient knowledge to teach disaster risk reduction." • "I can develop learning goals related to disaster risk reduction." • "I have all resources needed for teaching disaster risk reduction."
OCB (WF)	• "I am excited to undergo teacher professional development on disaster risk reduction." • "I like challenging myself in teaching disaster risk reduction." • "I am excited to experience something new along with teaching disaster risk reduction." • "I take risks in teaching disaster risk reduction." • "I look forward to new adventures in teaching disaster risk reduction." • "I am excited to experience changes along with the teaching of disaster risk reduction."
ACA (AGC)	• "Disaster risk reduction is certainly a real concern today." • "Efforts related to disaster risk reduction help reduce the impact of disasters." • "Disaster risk reduction is a concern for society."
ACB (APC)	• "Non-inclusion of disaster risk reduction in actual teaching is a real concern." • "Narrow/shallow inclusion of disaster risk reduction in actual teaching is a real concern." • "Difficulty in integrating disaster risk reduction in actual teaching is a real concern."
AR	• "I feel responsible for teaching disaster risk reduction." • "I feel responsible for integrating disaster risk reduction in teaching." • "I feel responsible for disaster risk reduction." • "I feel responsible for developing the capacity of my learners in disaster risk reduction." • "I feel responsible for actively taking a role in public awareness of disaster risk reduction." • "I feel an obligation to teach disaster risk reduction." • "I feel a strong personal obligation to integrate disaster risk reduction into teaching." • "I feel a moral obligation to contribute to disaster risk reduction." • "I feel that I should contribute to disaster risk reduction."
PN	• "I feel that it is important that people, in general, should know about disaster risk reduction." • "I feel that I must do something about disaster risk reduction to help the future generation." • "I should do what I can to teach disaster risk reduction." • "I should do what I can in teaching disaster risk reduction." • "Because of my values and principles, I feel an obligation to teach disaster risk reduction."

Table 4.
Continuation

Constructs	Items
SNA (SSN)	• "People I know contribute to disaster risk reduction." • "People I know are concerned about issues related to disaster risk reduction." • "Teachers I know are concerned about disaster risk reduction." • "My principal is concerned about disaster risk reduction." • "People I know think that it is important to teach disaster risk reduction in classes." • "Teachers I know teach disaster risk reduction."
SNB (GSN)	• "Most people important to me think that I should teach disaster risk reduction." • "Most people important to me want me to teach disaster risk reduction." • "Most people important to me think that I should contribute to disaster risk reduction."

4.1. Profession-specific values on teaching DRR

The first section of Table 4 enumerates the specific items that manifest AV, BV, EV, OCA (willingness to initiate), and OCB (willingness to face). AV includes "believing in equal opportunity for all on DRR, avoiding civil unrest, maintaining justice and order, as well as giving extra care to children before, during, and after a disaster." Meanwhile, BV includes "protecting natural resources from all disasters, living in harmony with other species, not hurting nature, and taking initiatives in preserving nature and the environment." Next, EV includes "the thought that one's teaching of DRR can impact the lives of students and their respective families and minimize disaster risks." OCA includes "being creative, having sufficient knowledge, being able to develop learning goals, and having all the resources needed to teach DRR." Examining the common theme of OCA items prompted the researcher to alternatively label it as the willingness to initiate (WI) in consideration that the said items generally refer to the initiative of the teacher to integrate and teach DRR. Meanwhile, OCB includes "being excited to undergo teacher professional development, to experience something new, and to experience changes along teaching DRR, as well as challenging oneself, taking a risk, and looking forward to new adventures in teaching DRR." Similarly, examining the common theme of the OCB items prompted the researcher to label it the willingness to face (WF) alternatively. That upon considering that the said items generally refer to teachers anticipating a future event/activity related to teaching DRR. Notably, AV and BV items tend to be generally similar to values about environmentally-relevant behaviour (Steg & De Groot, 2012) and are not necessarily definitive in teaching DRR. Meanwhile, EV, WI, and WF are all related to the teaching context and, therefore, considered profession-specific values (Barni et al., 2018). The latter is distinct from items established in the literature on pro-environmental behaviour (Stern et al., 1999; Stern, 2000).

4.2. Profession-specific beliefs on teaching DRR

The second section of Table 4 enumerates the specific items that manifest ACA (awareness of general consequence), ACB (awareness of profession-specific consequence), and AR. ACA includes "beliefs that DRR is a real concern today and a concern of society, as well as the belief that efforts on DRR may reduce the impact of disasters." Looking into the common theme of the items, the researcher alternatively labeled ACA as awareness of general consequence (AGC), considering that the items generally referred to beliefs of general consequence about DRR. Meanwhile, ACB includes the "belief that non-inclusion and shallow inclusion of DRR, as well as difficulty in integrating DRR in teaching, is a real concern." Examining the common theme of the items prompted the researcher to alternatively label ACB as awareness of profession-specific consequences (APC). Lastly, AR includes the "feeling responsible for DRR, integrating and teaching DRR, developing the capacity of learners, taking active participation in public awareness of DRR, as well as the feeling of strong personal and moral obligation to contribute to, integrate and teach DRR." APC and AR items are all related to teaching context and considered profession-specific beliefs on teaching DRR. Notably, these profession-specific beliefs are particularly similar to teacher self-efficacy beliefs (Barni et al., 2018) and closely related to "beliefs about children and young people, teaching, and educational purpose (Biesta et al., 2015)." The profession-specific beliefs established in this study were significantly distinct from AC and AR items in the literature (Ghazali et al., 2019; Stern et al., 1999).

4.3. Profession-specific norms on teaching DRR

The third section of Table 4 enumerates the specific items that manifest PN, SNA (specific social norm), and SNB (general social norm). PN includes the feeling that one should do something for the future generation and people must know DRR, the one should do what can be done to teach and in teaching DRR, as well as feeling an obligation to teach DRR because of one's values and principles. Meanwhile, SNA includes the thought that people one knows contribute and are concerned about DRR, including other teachers and school principals. Examining the common theme of the said items prompted the researcher to alternatively label SNA as a specific social norm (SSN) considering that these are expectations perceived from specific persons of proximity.

Lastly, SNB includes the thought that significant others think and want themselves to teach and contribute to DRR. Looking into the common theme of the said items prompted the researcher to alternatively label SNB as a general social norm (GSN) considering that items refer to generally perceived expectations from valued individuals. Remarkably, the majority if not all of

the items of PN, SSN, and GSN relate to teaching context and therefore may be considered profession-specific norms on teaching DRR which are significantly distinct from PN and SN items in the literature on pro-environmental behaviour (Ghazali et al., 2019; Stern et al., 1999; Stern, 2000).

4.4. Profession-specific values, beliefs, and norms on pro-environmental behaviour

Although the results of this study were limited to the integration and teaching of DRR, particularly in Biliran Province, the Philippines, its findings may have broad implications for environmentalism and may apply to islands and regions of similar context (ASEAN, 2013). It suggests the possible existence of profession-specific values, beliefs, and norms on pro-environmental behaviour. This may not be surprising considering that context is one of the important factors for environmentalism (e.g., demographic profile). To date, many studies on pro-environmental behaviour conducted using the lens of the Value-Belief-Norm Theory revolve around specific pro-environmental behaviour or studies between and among ethnicity (Ghazali et al., 2019) and or countries (Riepe et al., 2021). There is little, if there is any, that explores profession-specific environmentalism. In the case of teaching, it relates to a kind of private sphere environmentalism (e.g., selection and use of materials for classroom structuring and or office supplies) or a kind of non-activist behaviour in the public sphere (e.g., advocating, integrating, and teaching environmentalism and sustainability).

Schools at all levels are known forefront of many pro-environmental movements; therefore, the role of the teachers in achieving these goals is imperative. Without systematic and detailed guidelines on the integration and teaching of environmental awareness and advocacy campaigns (e.g., DRR), strengthening profession-specific values, beliefs, and norms on pro-environmental behaviour may be necessary to ensure success. This is in consideration that profession-specific values, beliefs, and norms may be determinants of the proactive looking for opportunity and frequent inclusion of environmentalism in the actual teaching and learning process. Cavanna and colleagues (2015) pointed out that elevated awareness of what the teachers value can reinforce purposeful teaching practice and, therefore, create more opportunities for students to learn. Early on, Tsukui and colleagues (2017) claimed that teachers' values can either encourage or restrict teachers to develop knowledge and skills and learn from their teaching.

Today, the literature remains ambiguous on the effect of teacher efficacy or sense of efficacy on student achievement and performance (Alrefaei, 2015; Jerrim et al., 2023; Shahzad & Naureen, 2017). A study by Alibakhshi and colleagues (2020) suggests that teacher efficacy could have pedagogical (i.e., provision of pedagogical and emotional support, and classroom management), student-related (i.e., support for student motivation, self-efficacy and engagement, general academic achievement, and learner autonomy), and psychological (i.e., burnout filtering, job satisfaction, teacher commitment, and retention) consequences. A number of studies relating to the development and encouragement of pro-environmental behavior among elementary and high school students highlight the importance of schools and teachers. For example, a study by Djuwita and Benyamin (2019) revealed that while there are no differences in nature-relatedness among elementary students in green and public schools, pro-environmental behaviors in green schools were found to be based on habits and social modeling, not necessarily knowledge nor environmental concern, but for public schools, pro-environmental behaviors were scarce because students were not used to it. Another study by Liang and colleagues (2022) revealed that different role models have a differential impact on students' pro-environmental behaviors (i.e., "A teacher picking up garbage in front of children significantly improves children's attention to the environment and their adoption of pro-environmental behavior.").

Advocacies on environmental conservation and protection, including climate change and sustainability, are interdisciplinary in nature. It requires the involvement and contribution of different sectors and disciplines to achieve its ultimate goal. That being so, stimulating profession-specific values, beliefs, and norms on environmentalism could likely increase the instances of conceptualizing and implementing field/discipline-specific environmental conservation, protection, and sustainability strategies. In this study, strengthening teachers' profession-specific values, beliefs, and norms on environmentalism could result in a multiplier effect. It could increase the likelihood and chances of teaching and integrating environmental education, consequently developing and strengthening students' efficacy of contributing to private sphere behaviors. Such behaviors are necessary on a large scale to be impactful (Stern 2000).

Moreover, many new inclusions in existing school curricula (e.g., integration and teaching of DRR) may require new knowledge and skills from teachers and, therefore, provide support and assistance through directed and contextually-relevant teacher professional development. Notably, teachers' values and beliefs were found to significantly correlate with teachers' knowledge base in teaching (Lai & Lin, 2018).

5. CONCLUSIONS, LIMITATIONS, RECOMMENDATIONS

The paper presents the possibility of the existence of distinct profession-specific values, beliefs, and norms on environmentalism derived from a study that explored the interplay of values, beliefs, and norms on teaching DRR using the Value-Belief-Norm Theory as a lens. Four hundred thirty-four public school science teachers from grades three to 10 in Biliran Province, the Philippines, participated in the two-phase cross-sectional survey. Results of exploratory factor analysis and parallel analysis in Phase 1 and confirmatory factor analysis in Phase 2 revealed the existence of profession-specific values, beliefs, and norms in teaching DRR that are distinct from values, beliefs, and norms on general DRR, suggesting the possible

existence of profession-specific values, beliefs, and norms towards environmentalism. The findings of this study may have important implications for both teaching and environmentalism, considering that schools are often at the forefront of many environmental advocacies, including environmental awareness, protection, and sustainability. Moreover, it opened opportunities to explore further profession-specific values, beliefs, and norms on environmentalism and the call for field/discipline-specific environmental conservation, protection, and sustainability strategies. Additionally, the findings of this study could inform policy-makers to consider advancing and scaffolding profession-specific values, beliefs, and norms on environmentalism, as well as developing field/discipline-specific environmental conservation, protection, and sustainability strategies. In the case of teaching, it may be necessary to create a room in the existing school curricula to teach environmental education, promote discussions about the environment, such as solutions to local environmental degradation issues, integrate environmental conservation, protection, and sustainability concepts in teaching methods (Stephen, 2009), instructional material selection and use, and assessment, among others.

This study may be limited to the locale and participants described in the earlier section; nevertheless, its findings may provide a reference for initiating and stimulating discourse on profession-specific values, beliefs, and norms on environmentalism and the development and implementation of a teacher professional development, not only anchored in generic or traditional teacher professional development models and frameworks but also consider and embeds frameworks or models on environmentalism (e.g., Value-Belief-Norm Theory).

Moving on, while many of the contextual variables (e.g., types of natural hazards, level of vulnerability to natural hazards, existing support and initiatives from the local and national government and private institutions, among others) at the backdrop may be similar elsewhere, the findings need to be adapted with caution considering those behavioral variables (e.g., values, beliefs, norms, teaching DRR) are heavily influenced and shaped by context. In addition, this study is exploratory. Therefore, it may be interesting to conduct a similar study with a significantly large sample to confirm the claims established in this study. Moreover, a parallel qualitative study may be relevant to investigate further the distinct characteristics and qualities of profession-specific values, beliefs, and norms and their respective impact on teaching DRR or pro-environmental behaviour, for that matter. Further, it may be interesting to explore the interaction of profession-specific values, beliefs, and norms on teaching DRR and compare the same with the interaction of more general values, beliefs, and norms on DRR. Not to mention the need to assess the association of values, beliefs, norms, and teaching DRR on student DRR efficacy. A paper by Constantine and colleagues (2019) enumerated "ways of supporting student self-efficacy, including task engagement, self-regulated learning, supportive feedback, social-communicative engagement, multi-sensory learning activities, and student-centered learning." It may be essential to explore how such student self-efficacy elements can be considered efficiently in teaching DRR. Furthermore, it may be imperative to determine and measure the moderating effect of important contextual and demographic variables related thereto, as well as explore and determine profession-specific values, beliefs, and norms on pro-environmental behaviour in other allied professional fields that have direct and indirect role/s in environmental protection, preservation, and sustainability. Finally, exploring new opportunities for integrating disaster risk reduction into existing curricula in basic education and various higher education programs may be imperative (Kagawa & Selby, 2014; Maya & Çalişkan, 2016).

Research and Publication Ethics Statement

The study reported in this paper was part of a bigger project whose protocol was reviewed and granted approval for implementation by the Universiti Sains Malaysia Research Ethics Board and assigned the protocol code USM/JEPEM/20060314. Moreover, permission was sought and granted from other relevant authorities (i.e., schools division superintendent), and informed consent to participate and publish data and results related thereto was obtained from all the participants prior to the conduct of the study.

Contribution of the Authors to the Article

This paper was derived from the first author's doctoral dissertation supervised by the second author. Both authors contributed equally in conceptualizing and writing the paper.

Statement of Interest

The authors state that there is no conflict of interest for this submission.

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