VALIDATING THE SCHOOL-LEVEL ENVIRONMENT QUESTIONNAIRE WITHIN THE VIETNAMESE EDUCATIONAL CONTEXT

iD **Van Dat Tran**

An Giang University, Vietnam National University, Ho Chi Minh City, Vietnam.
Email: tvdat@agu.edu.vn Tel: 0084-913678974

ABSTRACT

In recent years, researchers have increasingly focused on dimensions of the school environment because of their effects on teachers' outcomes such as teaching efficacy, job satisfaction, and commitment. However, current literature illustrates that not many studies on different aspects regarding schools' environmental issues have been conducted in Vietnam. The purpose of this research, thus, was to validate the psychometric properties in the 56-item School-Level Environment Questionnaire (SLEQ), which was translated into Vietnamese and administered to 387 Vietnamese junior high school teachers. Factorial analysis indicated that the eight-factor structure of the original SLEQ, which included innovation, resource adequacy, professional interest, affiliation, student support, mission consensus, empowerment, and work pressure, was appropriate for junior high school teachers' psychometric properties. The internal consistency and reliability of general scale and eight subscales were satisfactory. The results confirmed the suitability of the SLEQ for measuring teachers' perceptions of their school environment within the Vietnamese educational context. The study suggests to investigate the validity of the SLEQ, apart from other issues, with a different sample among elementary and secondary school teachers.

Contribution/Originality: This study uniquely examined the school-level environment scale conducted with teachers in a Vietnamese educational context. It contributed to judging the feasibility and validity of an eight-factor model of the SLEQ, which consisted of innovation, resource adequacy, affiliation, student support, mission consensus, empowerment, and work pressure in the Vietnamese educational context.

1. INTRODUCTION

In education discipline, researchers have increasingly focused on factors of the school environment. These factors include innovation, resource adequacy, professional interest, affiliation, student support, mission consensus, empowerment, and work pressure because the school environment greatly affects teachers' teaching efficacy (Hoy & Woolfolk, 1993) teachers' job satisfaction (Butt et al., 2005; Collie, Shapka, & Perry, 2012; Fisher & Fraser, 1990; Taylor & Tashakkori, 1995) and teachers' attitudes toward their workload and student behaviors (Collie et al., 2012; Fisher & Cresswell, 1999; Grayson & Alvarez, 2008; Skaalvik & Skaalvik, 2009). The school environment also shapes teachers' perception about the effectiveness of a school (Creemers, Peters, & Reynolds, 1989) and determines teachers' and students' behaviors and the quality of teaching and learning (Hoy & Woolfolk, 1993; Hughes, 1991)

and influences teachers' commitment to both their profession and school (Collie, Shapka, & Perry, 2011; Tarter, Hoy, & Kottkamp, 1990) and their retention (Miller, Brownell, & Smith, 1999).

Therefore, gaining an understanding of how teachers perceive their school environments is worth further research. Such an endeavor may contribute to the knowledge based on this topic and facilitate potential improvements to school environments that lead to increased satisfaction and productivity within a school. After acknowledging the essential need to understand teachers' perceptions of their work environment, various instruments have been designed to examine the qualities of a school environment. However, research examining the reliability and validity of a school-level environment instrument in the context of Vietnamese junior high schools has been limited, leaving a gap in the knowledge and hampering the educators' ability to improve the school environment in Vietnam, in particular. The present study examines an available instrument designed to measure school environment, the SLEQ (Fisher & Fraser, 1990) in order to evaluate its factor structure in the Vietnamese context. The results of the study would enrich the understanding of Vietnamese high school teachers and school leaders regarding how to effectively improve their school environment.

1.1. School-Level Environment

A school environment is also termed as school climate or organizational health, and studies have sought to define and understand its intrinsic elements. For example, according to one definition, the idea includes "the atmosphere, culture, resources, and social networks of a school" (Loukas & Murphy, 2007). This environment is further regarded as the "esprit de corps" (Perry, 1908) and, highlighting its importance, the "heart and soul" (Freiberg, 1999) of the institution. Moos (1979) described the influences of the school environment in the following terms: "The social ecological setting in which students function can affect their attitudes and moods, their behavior and performance and their self-concept and general sense of well-being" (p. 3). The author defines three types of dimensions that can facilitate defining this environment: relationship, personal development, and system maintenance and change. Specifically, the relationship dimensions (e.g., peer support, involvement) measure a person's level of involvement in the environment, the extent of help and support offered between individuals, and the level of freedom and openness of expression among them. Next, the dimensions of personal development (e.g., autonomy, competition) help navigate actions related to personal development and self-enhancement. The last dimension refers to the system maintenance and system change (e.g., innovation, clarity, work pressure) assess system order, establish the clarity of expectations, and identify how the system controls or responds to change. An adequate assessment of a human environment requires examining these three dimensions together.

Following the definition of these dimensions that Moos (1979) suggested for assessing an environment, researchers have devoted ongoing efforts to developing and evaluating instruments to measure the qualities of a classroom learning environment according to students' perception (Fraser, 2007; Fraser & Walberg, 1991). However, even though teachers are also involved in the classroom-level environment in terms of their relationships with students and other teachers, these educators' perceptions have not been adequately examined (Fraser & Fisher, 1982) and the perception of senior staff and school principals have received even less scholarly attention (Fraser & Rentoul, 1982; Genn, 1984). The current literature has highlighted the positive association between a good school environment and student achievement, supporting the idea that a better environment in the eyes of teachers corresponds to students producing better achievements (Collie et al., 2012). This belief is founded upon the widely acknowledged influences of the school's pervasive climate and the school culture on the behaviors of staff members and students, thus determining the quality of teaching and learning as well as student academic performance (Brookover, Beady, Flood, Schweitzer, & Wisenbaker, 1979; Hughes, 1991; Purkey & Smith, 1982).

Different measurement models have been proposed to examine the school environment, including the College Characteristics Index (CCI) (Pace & Stern, 1958) the High School Characteristics Index (HSCI) (Stem, 1970) and the Organizational Climate Description Questionnaire (OCDQ) (Halpin & Croft, 1963) the Work Environment

Scale (WES) (Moos, 1981) and the SLEQ (Fisher & Fraser, 1990; Rentoul & Fraser, 1983). Among the existing models, the SLEQ is a promising instrument for school environment assessment (Johnson & Stevens, 2001). Before developing the SLEQ, Rentoul and Fraser (1983) thoroughly reviewed the previously existing instruments. The authors then developed the SLEQ following Moos (1979) three general dimensions, minimally overlapping with other measuring instruments and employing economical values. After applying the SLEQ on three samples of teachers, Fraser (1994) reported that the internal consistency (Cronbach's alpha) of the scales ranged from 0.64 to 0.91, indicating satisfactory internal consistency for scales of seven items. As indexed by the mean correlation of a scale with the other seven scales, the discriminant validity ranged from 0.05 to 0.42. This result suggested satisfactory discriminant validity and showed that the instrument could measure the distinct although somewhat overlapping components of a school environment.

Fisher and Fraser (1990) additionally reported the results of a one-way ANOVA for each SLEQ scale, labeling school membership as the main effect to provide validation data. Each scale of the SLEQ considerably differed between schools ($p < 0.001$). The eta² statistic (an estimate of the variance level in SLEQ scores based on school membership) ranged from 0.16 to 0.40. Researchers have also confirmed the reliability and validity of the SLEQ when used to measure school-level environment (Cresswell & Fisher, 1989; Dorman, Fraser, & McRobbie, 1995; Fisher, Fraser, Wubbels, & Brekelmans, 1993; Templeton & Jensen, 1995).

The SLEQ contains 56 items in eight scales: student support (SS, "There is good rapport between teachers and students and students behave in a responsible self-disciplined manner"), affiliation (AF, "Teachers can obtain assistance, advice, and encouragement and are made to feel accepted by colleagues"), professional interest (PI, "Teachers discuss professional matters, show interest in their work, and seek further professional development"), mission consensus (MC, "Teachers are free of set rules, guidelines, and procedures, and of supervision to ensure rule compliance"), empowerment (EM, "Teachers have the opportunity to participate in decision-making"), innovation (IN, "The school is in favor of planned change and experimentation and fosters classroom openness and individualization"), resource adequacy (RA, "Support personnel, facilities, finance, equipment, and resources are suitable and adequate"), and work pressure (WP, "The extent to which work pressure dominates the school environment"), each of which contains seven items (Webster & Fisher, 2003).

1.2. The Present Study

The SLEQ has proved a conceptually effective measure to examine teachers' classroom-level environment. Most research studies that have examined the strong impacts of the classroom environment on students' cognitive and affective outcomes have been implemented in the context of Western education (Fisher & Khine, 2006) focusing predominantly on students' rather than teachers' perceptions of the classroom-level environment (Fraser, 1998). Consequently, this study aims to address this limitation in the literature to examine the factor structure of the SLEQ in terms of measuring teachers' perceptions of their school environment to support future school environment research. Additional research can build upon the stable factor structure of the SLEQ that has already been established in current cross-cultural studies by examining teachers' perceptions in other educational contexts to further test and validate this instrument. For example, topics related to the school environment have not received adequate attention in the Vietnamese context, as no existing study has examined the school environment from the viewpoint of teachers in Vietnamese schools. Moreover, the current study is the pioneer to address the gap in the current knowledge of the school environment, particularly in the Vietnamese educational setting. In particular, this study examines the psychometric properties of the 56-item SLEQ in the Vietnamese educational context and provides a model that can be adapted and applied to measure teachers' learning environment. The SLEQ, which has recently been repeatedly used in studies, comprise a multidimensional structure as its original factor structure. Investigating the psychometric properties of the SLEQ can help determine whether the eight factors in the SLEQ will emerge in the case of Vietnamese junior high teachers. The findings of the present study

will inform school principals of how to improve or modify the aspects of the school environment to establish a more effective school climate for both teachers and students.

2. METHODS

2.1. Participants

In this study, a convenience sample included a total of 387 classroom teachers, 213 females (55%) and 174 males (45%), from 7 junior high schools (grades 10-12) in Vietnam. In this group, 191 participants (49%) were from urban areas, while the suburban participants numbered 196 (51%). The participants' average years of teaching experience was 6.38 (SD = 2.40), and their average age was 33.72 years (SD = 7.75). In terms of gender, the average age for female participants was 32.73 years (SD = 7.07), while this number for male participants was 35.37 years (SD = 8.53). Participation was voluntary; however, when the participants were asked to fill out the survey, the response rate was high (87%). All responses collected from the SLEQ were anonymous and kept confidential.

2.2. Instrumentation

Data collection from the participants employed a paper-and-pencil format of the 56-item version of the SLEQ (Fisher & Fraser, 1990) translated into Vietnamese. The SLEQ was translated into Vietnamese by two bilingual professionals, who worked independently and were familiar with teaching. Next, two other bilingual translators from different backgrounds, also working independently, performed back translation. The back translation revealed that the original and translated version of the SLEQ had a high level of linguistic similarity. Eight items were dropped to make the SLEQ fit linguistically, functionally, and culturally with the target population. As a result, the Vietnamese SLEQ had 48 items. The scale consisted of 48 items to measure teachers' perceptions of their school environments. These items were divided into eight subscales, each of which contained six items. The subscales comprised SS (e.g., "Most students are well-mannered and respectful to the school staff"), AF (e.g., "I receive encouragement from colleagues"), PI (e.g., "Teachers discuss teaching methods and strategies with each other"), MC (e.g., "The organization of this school reflects its goals"), EM (e.g., "Teachers would be asked to participate in decisions concerning administrative policies and procedures"), IN (e.g., "New and different ideas are being tried in this school"), RA (e.g., "Class sets of important resource books are available when needed"), and WP (e.g., "Teachers would have to work long hours to complete all their work"). For each item, the respondents indicated their answers using a 5-point scale. There were 27 positively worded items and 21 negatively worded items. Items assigned (+) were scored 1, 2, 3, 4, and 5 for the responses SD (Strongly Disagree), D (Disagree), U (Undecided), A (Agree), and SA (Strongly Agree), respectively. Items assigned (-) were scored in a reverse way. The study involved administering the Vietnamese version of the SLEQ to 387 junior high school teachers who were asked to fill out their answers in a time frame of approximately 60 minutes. Table 1 presents descriptive statistics, including the means, standard deviations, and Cronbach's alpha coefficients of the components' internal consistency.

2.3. Data Analysis

The present study aimed to validate the factor structure of the SLEQ within the Vietnamese educational context. Therefore, both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were performed. First, EFA was carried out with principal-axis factoring, using varimax rotation to explore the scale's possible factor structure. The Kaiser-Meyer-Olkin (KMO) measure ($0.50 < KMO < 1$), Bartlett's test ($p < 0.50$), factor loading > 0.50, and Eigenvalue > 1 were fixed. Then, the CFA was used to verify the model's latent structural validity. The standardized estimates and modification indices were used as the output to evaluate the model fit. The model fit was further examined with the chi-square/degrees of freedom ratio ($\chi^2/df \leq 3$), the goodness of fit index (GFI ≥ 0.90), the comparative fit index (CFI ≥ 0.90) and the Tucker-Lewis index (TLI ≥ 0.90), and the root mean square error of approximation (RMSEA ≤ 0.80). The SLEQ's internal consistency and each of the eight subscales

was calculated by the Cronbach's alpha coefficient separately. The Cronbach's alpha coefficient was set at α ≥ 0.70, and the corrected item-total correlation should be ≥ 0.30. The correlation coefficient among subscales of the SLEQ were set at r ≥ 0.05.

Table 1. EFA for the SLEQ.

Items		Mean	SD	Factor loading							
				IN	RA	PI	AF	SS	MC	EM	WP
46	There is much experimentation with different teaching approaches.	3.35	0.75	0.71							
30	Most teachers like the idea of change.	3.34	0.70	0.74							
54	New and different ideas are being tried in this school.	2.82	0.68	0.75							
38	New courses or curriculum materials are seldom implemented in the school.	2.70	0.66	0.79							
55	Projectors for filmstrips, transparencies are usually available when needed.	3.41	0.68		0.72						
7	The school or department library includes an adequate selection of books and periodicals.	3.37	0.76		0.81						
23	Video equipment, tapes, and films are readily available and accessible.	3.30	0.70		0.73						
39	Tape recorders and cassettes are seldom available when needed.	2.87	0.71		0.73						
3	Teachers frequently discuss teaching methods and strategies with each other.	3.41	0.77			0.79					
27	Many teachers attend in-service and other professional development courses.	3.38	0.72			0.78					
43	Teachers are keen to learn from their colleagues.	3.36	0.74			0.76					
51	Teachers show considerable interest in the professional activities of their colleagues.	3.33	0.70			0.66					
10	I feel accepted by other teachers.	4.40	0.72				0.79				
26	I feel that I could rely on my colleagues for assistance if I needed it.	4.16	0.79				0.75				
18	I am ignored by other teachers.	4.10	0.86				0.76				
2	I seldom receive encouragement from colleagues.	4.06	0.84				0.76				
49	Very strict discipline is needed to control many of the students.	3.35	0.70					0.67			
41	Most students are well-mannered and respectful to the school staff.	3.33	0.75					0.71			
25	There are many noisy, badly-behaved students.	3.31	0.68					0.80			
33	Students get along well with teachers.	3.29	0.74					0.63			
12	I am not expected to conform to a particular teaching style.	3.37	0.76						0.80		
20	It is considered very important that I closely follow syllabuses and lesson plans.	3.36	0.75						0.75		
4	I am often supervised to	3.34	0.81						0.80		

#	Item	M	SD	IN	RA	PI	AF	SS	MC	EM	WP
	ensure that I follow directions correctly.										
36	I am allowed to do almost as I please in the classroom.	3.31	0.75						0.66		
29	Teachers are frequently asked to participate in decisions concerning administrative policies and procedures.	3.42	0.67							0.68	
45	I must ask my subject department head or senior member of staff before I do most things.	3.38	0.74							0.72	
53	I have very little say in the running of the school.	3.36	0.74							0.72	
5	Decisions about the running of the school are usually made by the principal or a small group of teachers.	3.23	0.77							0.71	
16	Teachers have to work long hours to complete all their work.	3.39	0.81								0.62
40	You can take it easy and still get the work done.	3.35	0.80								0.75
32	There is no time for teachers to relax.	3.32	0.79								0.77
56	It is hard to keep up with your workload.	3.30	0.78								0.68
Eigenvalue				8.29	3.02	2.40	2.15	1.98	1.76	1.32	1.06
Cum %				24.63	32.81	38.95	44.33	49.17	53.31	55.96	58.02

Note: Factor loadings < 0.50 were omitted.
SLEQ = school-level environment questionnaire; IN = innovation; RA = resource adequacy; PI = professional interest; AF = affiliation; SS = student support; MC = mission consensus; EM = empowerment; WP = work pressure.

3. RESULTS

The teachers' responses to the eight components of the SLEQ were checked for internal consistency. Using Cronbach's alpha coefficients, these analyses suggested that eight items of the 48-item scale (items 1, 8, 11, 22, 24, 28, 34, and 44) should be dropped due to their low item-total correlations (< 0.30) and the remaining 40 items of the eight subscales were used for EFA analyses. According to the results, the alpha reliabilities of the eight subscales ranged from 0.67 to 0.79, with an average of 0.73, indicating satisfactory levels of internal consistency.

EFA was done with principal-axis factoring followed by the varimax rotation to explore the 40-item scale's possible factor structure. The KMO measure (KMO = 0.88) and Bartlett's test of sphericity ($\chi^2_{(780)}$ = 5877.64, p < 0.000) suggested that the factor analysis of the 40-item scale was suitable (Hair, Black, Babin, Anderson, & Tatham, 2006). The results revealed a solution of nine factors with eigenvalues greater than one, reporting for 55.71% of the total variance. Almost all items were loaded on each of the original eight subscales. However, one factor had only one item (item 50 ["I often feel lonely and felt out of things in the staffroom"] from AF loaded on component 9). In addition, the loadings of items 6, 13, 15, 19, 21, 47, and 48 were less than 0.50 within each of the eight factors. Therefore, these eight items were eliminated.

Table 2. Means, standard deviations, Cronbach's alpha (α), and inter-factor correlations.

	No. of items	α	No. of items	α	No. of items	M	SD	α	SLEQ	IN	RA	PI	AF	SS	MC	EM	WP
SLEQ	48	0.81	40	0.84	32	3.40	0.35	0.89	1	0.59**	0.55**	0.64**	0.22**	0.57**	0.77**	0.46**	0.80**
IN	6	0.77	5	0.81	4	3.06	0.58	0.84		1	0.20**	0.25**	0.13*	0.19**	0.43**	0.18**	0.46**
RA	6	0.69	6	0.72	4	3.23	0.59	0.83			1	0.27**	-0.14*	0.21**	0.40**	0.10*	0.41**
PI	6	0.70	5	0.75	4	3.37	0.60	0.84				1	0.03	0.24**	0.45**	0.24**	0.46**
AF	6	0.78	5	0.81	4	4.17	0.67	0.85					1	0.11*	-0.19*	-0.11*	-0.14*
SS	6	0.67	4	0.70	4	3.32	0.57	0.80						1	0.38**	0.15**	0.40**
MC	6	0.79	4	0.81	4	3.34	0.65	0.86							1	0.29**	0.62**
EM	6	0.65	6	0.69	4	3.34	0.58	0.80								1	0.35**
WP	6	0.79	5	0.82	4	3.33	0.66	0.85									1

Note: N = 387, *p < .05, and **p < .01

SLEQ = school-level environment questionnaire; IN = innovation; RA = resource adequacy; PI = professional interest; AF = affiliation; SS = student support; MC = mission consensus; EM = empowerment; WP = work pressure.

Next, the factor structure of the resulting 32-item scale was explored by using principal-axis factoring with varimax rotation. The results indicated the appropriateness of the factor analysis for the 32-item scale (KMO = 0.88 and $\chi^2_{(496)}$ = 4314.32, p < 0.000). The same eight factors with eigenvalues greater than one were confirmed and with loadings ranging from 0.62 to 0.81. The eight factors reported for 58.02% of the total variance. Table 1 presents a summary of EFA analyses for the SLEQ.

The CFA results for these 32 items endorsed the identical eight-factor solution of the SLEQ as found from the study results reported by Fisher and Fraser (1990). The model had good fit indices, χ^2 = 449.0, df = 436, χ^2/df = 1.03, p = 0.000, TLI = 0.96, CFI = 0.99, and RMSEA = 0.01 (Hu & Bentler, 1999; Marsh & Hocevar, 1985; Steiger, 2007; Tabachnick & Fidell, 2013). The factor loadings (standardized estimates) of all eight subscales ranged from 0.67 to 0.82. The results indicated the model fit with the data and the eight-factor structure of the model was appropriate to explain the school-level environment. The fit model of the SLEQ was illustrated in Figure 1.

Table 2 displays the results of descriptive and inferential analyses. The eight subscales of the SLEQ had means and standard deviations of from 3.06 (0.58) to 3.37 (0.60). The corrected item-total correlation values of all items indicated the discriminant capacity of each item (ranging from 0.41 for item 16 to 0.77 for item 38) (Nunnally & Bernstein, 1978). In addition, Cronbach's alpha values of all subscales were satisfactory (α = 0.84 for IN, α = 0.83 for RA, α = 0.84 for PI, α = 0.85 for AF, α = 0.80 for SS, α = 0.86 for MC, α = 0.80 for EM, and α = 0.85 for WP) (DeVellis, 1991). The SLEQ and the eight subscales had high correlations, ranging from 0.22 to 0.80, indicating that the SLEQ had good convergent validity. The correlations between the eight subscales were moderate positive ranging from 0.10 to 0.62. Therefore, these subscales of the SLEQ were distinct.
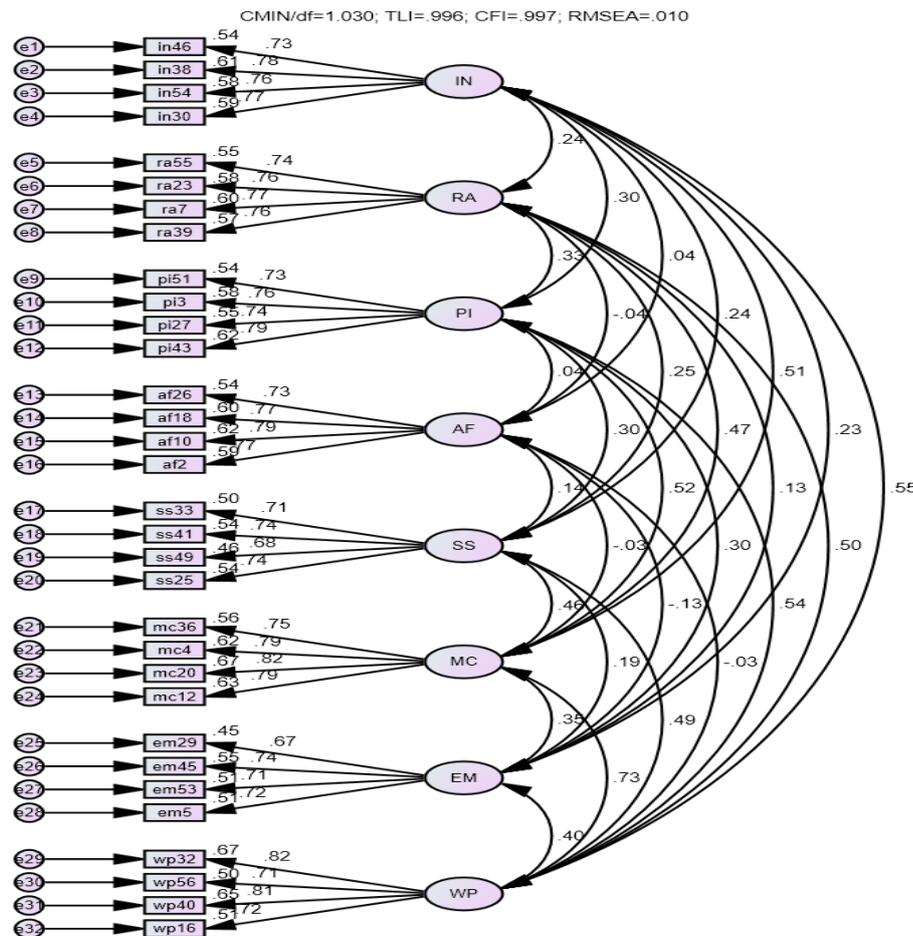

Figure 1. The best fit model of the SLEQ.

4. DISCUSSION

The present study explored the factor structure of the SLEQ version adapted in the Vietnamese junior high school background. EFA results presented a solution of the eight factors of the SLEQ. All items clustered around the same eight factors identified by Fisher and Fraser (1991). The results confirmed the configural equivalence of the SLEQ in the context of junior high schools in Vietnam. Even though the factor structure of the 40-item SLEQ was constant in some previous studies, the EFA analyses found that factor loadings of eight factors were below 0.50 and their communities were below 0.30. Specifically, item 6 from IN ("It is very difficult to change anything in this school"), which happened to be a more effective measure of the decision-making practices than the level of innovation, was loaded on EM. Nevertheless, this item had low factor loading (< 0.50). Two of the six items (items 13 ["I have to refer even small matters to a senior member of staff for a final answer"] and 21 ["Action can usually be taken without gaining the approval of the subject department head or a senior member of staff"]) from the EM subscale loaded together on PI. Additionally, two items (15 ["The supply of equipment and resources is inadequate"] and 47 ["Facilities are inadequate for catering for a variety of classroom activities and learning groups of different sizes"]) under RA had low factor loadings (< 0.50). Three other items (item 19 from PI ["Professional matters are seldom discussed during staff meetings"], item 48 under WP ["Seldom are there deadlines to be met"], and item 50 from AF ["I often feel lonely and left out of things in the staffroom"]) also had low factor loadings. Consequently, eight items were excluded in the final subscale because of their low factor loadings.

CFA was further conducted to test the model-data fit. CFA results verified a solution of eight factors with 32 items based on the 40-item SLEQ. Even if the revised scale has a small number of items than the original SLEQ, its factor structure is still reliable and has after removing 24 items. According to the results, the eight-factor model fits well for the group of Vietnamese teachers. The fit index values for the eight-factor model provide a good model-data fit for a Vietnamese group of junior high school teachers. The results show that the structure of the SLEQ is in accordance with the conceptual framework proposed by Fisher and Fraser (1991) which includes the eight factors of the SLEQ for teachers in Australia and other studies conducted in several countries (Johnson & Stevens, 2001; Webster & Fisher, 2003). These results suggest that this scale can be applied in research on school environments in different cultures. In addition, predictive validity and convergent validity of the SLEQ are satisfactory as well as correlations among eight subscales of the SLEQ were appropriate for a group of teachers in Vietnam.

5. CONCLUSION

The present study has supported the eight-factor structure of the SLEQ in spite of the removal of 24 items from the original scale. This removal might be affected by the cultural and social contexts of the chosen study population. This investigation provides the first validation of the school-level environment scale conducted with teachers in a Vietnamese educational context. The results confirm that an eight-factor model of the SLEQ, which consists of innovation, resource adequacy, affiliation, student support, mission consensus, empowerment, and work pressure in a Vietnamese educational context. Although not many studies have explored how the SLEQ operates in different settings, the results of this study highlight the strong internal consistency of 32 items of the SLEQ in the Vietnamese context. According to the study findings, groups of Vietnamese teachers share some cultural practices and beliefs and may share some educational values and practices. Thus, the study adds empirical evidence to reinforce the use of the SLEQ to assess the school environment in Vietnam to spread out the generalizability of the scale.

6. LIMITATIONS

Though the solution of the eight-factor structure was confirmed, some limitations should be identified. First, the present study utilized a convenience sample in which the teachers were chosen based on their availability. Randomized samples should be used to increase the generalizability of the results in future research. Additionally,

very few studies in Vietnam have been conducted to explore the factor structure of the SLEQ. Therefore, further studies should extend the investigation of the validity of the SLEQ with another sample of Vietnamese teachers, including both primary school and secondary school teachers.

REFERENCES

Brookover, W. B., Beady, C., Flood, P., Schweitzer, J., & Wisenbaker, J. (1979). *Schools, social systems and student achievement: Schools can make a difference.* New York: Praeger.

Butt, G., Lance, A., Fielding, A., Gunter, H., Rayner, S., & Thomas, H. (2005). Teacher job satisfaction: Lessons from the TSW pathfinder project. *School Leadership and Management, 25*(5), 455-471.Available at: https://doi.org/10.1080/13634230500340807.

Collie, R. J., Shapka, J. D., & Perry, N. E. (2012). School climate and social-emotional learning: Predicting teacher stress, job satisfaction, and teaching efficacy. *Journal of Educational Psychology, 104*(4), 1189-1204.Available at: https://doi.org/10.1037/a0029356.

Collie, R. J., Shapka, J. D., & Perry, N. E. (2011). Predicting teacher commitment: The impact of school climate and social–emotional learning. *Psychology in the Schools, 48*(10), 1034-1048.Available at: https://doi.org/10.1002/pits.20611.

Creemers, B., Peters, T., & Reynolds, D. (1989). *School effectiveness and school improvement.* Amsterdam, The Netherlands: Swets & Seitlinger.

Cresswell, J., & Fisher, D. L. (1989). *A school level environment study in Australia.* Paper presented at the The Annual Meeting of the American Educational Research Association, Montreal, Canada.

DeVellis, R. F. (1991). *Scale development theory and applications (Applied Social Research Methods Series)* (Vol. 26). Thousand Oaks, CA: Sage Publications.

Dorman, J. P., Fraser, B. J., & McRobbie, C. J. (1995). Associations between school-level environment and science classroom environment in secondary schools. *Research in Science Education, 25*(3), 333-351.Available at: https://doi.org/10.1007/bf02357406.

Fisher, D. L., & Cresswell, J. (1999). Relationships between the principal's interpersonal behaviour and the school environment. *International Studies in Educational Administration, 27*(1), 29–44.

Fisher, D. L., & Fraser, B. J. (1990). *Validity and use of the school-level environment questionnaire.* Paper presented at the The Annual Meeting of the American Educational Research Association, Boston, MA.

Fisher, D. L., Fraser, B. J., Wubbels, T., & Brekelmans, M. (1993). Associations between school learning environment and teacher interpersonal behaviour in the classroom. In D. L. Fisher (Ed.), The study of learning environments (Vol. 7, pp. 32–41). Perth, Australia: Curtin University of Technology

Fisher, D. L., & Khine, M. S. (2006). *Contemporary approaches to research on learning environments.* Worldviews, Singapore: World Scientific.

Fisher, D. L., & Fraser, B. J. (1991). Validity and use of school environment instruments. *Journal of Classroom Interaction, 26*(2), 13-18.

Fraser, B. J. (1994). Research on classroom and school climate. In D. Gabel, Handbook of research on science teaching and learning (pp. 493-541). New York: Macmillan.

Fraser, B. J. (1998). Science learning environments: Assessment, effects and determinants. In B. J. Fraser & K. G. Tob (Eds.), The international handbook of science education (pp. 527-564). Amsterdam, The Netherlands: Kluwer Academic Publishers.

Fraser, B. J. (2007). Classroom learning environments In S. K. Abell & N. G. Lederman (Eds.), Handbook of research on science education (pp. 103-124). New York: Lawrence Erlbaum.

Fraser, B. J., & Walberg, H. (1991). *Educational environments: Evaluation, antecedents and consequences.* Oxford, UK: Pergamon.

Fraser, B. J., & Fisher, D. L. (1982). Predicting students' outcomes from their perceptions of classroom psychosocial environment. *American Educational Research Journal, 19*(4), 498-518.Available at: https://doi.org/10.3102/00028312019004498.

Fraser, B. J., & Rentoul, A. J. (1982). Relationships between school-level and classroom-level environment. *Alberta Journal of Educational Research, 28*(3), 212-225.

Freiberg, H. J. (1999). Introduction. In H. J. Freiberg (Ed.), School climate: Measuring, improving, and sustaining healthy learning environments (pp. 1-11). London, UK: Falmer Press.

Genn, J. M. (1984). Research into the climates of Australian schools, colleges and universities: Evaluating alternative schools. *Teacher and Teacher Education, 3*(3), 219–231.

Grayson, J. L., & Alvarez, H. K. (2008). School climate factors relating to teacher burnout: A mediator model. *Teaching and Teacher Education, 24*(5), 1349-1363.Available at: https://doi.org/10.1016/j.tate.2007.06.005.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate data analysis* (6th ed.). Upper Saddle River, NJ: Pearson University Press.

Halpin, A. W., & Croft, D. B. (1963). *Organizational climate of schools.* Chicago, IL: Midwest Administration Center, University of Chicago.

Hoy, W. K., & Woolfolk, A. E. (1993). Teachers' sense of efficacy and the organizational health of schools. *The Elementary School Journal, 93*(4), 355-372.Available at: https://doi.org/10.1086/461729.

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*(1), 1-55.Available at: https://doi.org/10.1080/10705519909540118.

Hughes, P. W. (1991). *Teachers' professional development.* Melbourne: Australian Council for Educational Research.

Johnson, B., & Stevens, J. J. (2001). Exploratory and confirmatory factor analysis of the school level environment questionnaire (SLEQ). *Learning Environments Research, 4*(3), 325-344.

Loukas, A., & Murphy, J. L. (2007). Middle school student perceptions of school climate: Examining protective functions on subsequent adjustment problems. *Journal of School Psychology, 45*(3), 293-309.Available at: https://doi.org/10.1016/j.jsp.2006.10.001.

Marsh, H. W., & Hocevar, D. (1985). Application of confirmatory factor analysis to the study of self-concept: First-and higher order factor models and their invariance across groups. *Psychological Bulletin, 97*(3), 562-582.Available at: https://doi.org/10.1037/0033-2909.97.3.562.

Miller, M. D., Brownell, M. T., & Smith, S. W. (1999). Factors that predict teachers staying in, leaving, or transferring from the special education classroom. *Exceptional Children, 65*(2), 201-218.Available at: https://doi.org/10.1177/001440299906500206.

Moos, R. H. (1979). *Evaluating educational environments: Procedures, measures, findings and policy implications.* San Francisco, CA: Jossey-Bass.

Moos, R. H. (1981). *Manual for work environment scale.* Palo Alto, CA: Consulting Psychologists Press.

Nunnally, J., & Bernstein, I. (1978). *Psychometric theory.* New York: Tata McGraw-Hill Ed.

Pace, C. R., & Stern, G. G. (1958). An approach to the measurement of psychological characteristics of college environments. *Journal of Educational Psychology, 49*(5), 269-277.Available at: https://doi.org/10.1037/h0047828.

Perry, A. C. (1908). *The management of a city school.* New York: Macmillan.

Purkey, S. C., & Smith, M. S. (1982). Too soon to cheer? Synthesis of research on effective schools. *Educational Leadership, 40*(3), 64-69.

Rentoul, A. J., & Fraser, B. J. (1983). Development of a school—level environment questionnaire. *Journal of Educational Administration, 21*(1), 21-39.Available at: https://doi.org/10.1108/eb009866.

Skaalvik, E. M., & Skaalvik, S. (2009). Does school context matter? Relations with teacher burnout and job satisfaction. *Teaching and Teacher Education, 25*(3), 518-524.Available at: https://doi.org/10.1016/j.tate.2008.12.006.

Steiger, J. H. (2007). Understanding the limitations of global fit assessment in structural equation modeling. *Personality and Individual Differences, 42*(5), 893-898.Available at: https://doi.org/10.1016/j.paid.2006.09.017.

Stem, G. G. (1970). *People in context: Measuring person-environment congruence in education and industry.* New York: Wiley.

Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics* (6th ed.). Boston, MA: Pearson.

Tarter, C., Hoy, W., & Kottkamp, R. (1990). School health and organizational commitment. *Journal of Research and Development in Education, 23*(4), 236-242.

Taylor, D., & Tashakkori, A. (1995). Participation in decision making and school climate as predictors of teachers' job satisfaction and sense of efficacy. *Journal of Experimental Education, 63*(3), 217-233.Available at: https://doi.org/10.1080/00220973.1995.9943810.

Templeton, R. A., & Jensen, R. A. (1995). How exemplary teachers perceive their environments. In D. L. Fisher (Ed.), The study of learning environments (Vol. 7, pp. 94-105). Perth, Australia: Curtin University of Technology.

Webster, B. J., & Fisher, D. L. (2003). School-level environment and student outcomes in mathematics. *Learning Environments Research, 6*(3), 309-326.