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The dimensional structure of the Student Leadership Practices Inventory

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Abstract
The present study assesses the factor structure of the Student Leadership Practices Inventory (S-LPI). Specifically, it examines the feasibility of its use with Malaysian university students. A self-report measure of S-LPI was administered to a sample of undergraduate students. The result of principal components analysis retained a 5-factor solution with satisfactory psychometric properties. Meanwhile, the reliability tests also indicated satisfactory reliability scores on each of the five latent factors of S-LPI. The psychometric features of S-LPI supported its feasibility as a sound and reliable research instrument to measure student leadership practices in the Malaysian context. Other implications of the findings are discussed.
Keywords: Student leadership; Psychometric; Principal components analysis

1. Introduction

'Nurturing tomorrow's leaders' has been a primary goal of higher learning since the inception of colleges and universities (Council for Industry and Higher Education (CIHE) 2010, Johnson, 2000; Kelley 2008; Komives, Lucas & McMahon, 2007). Historically, the main objective of higher education has been to prepare students to be future leaders. Until recently, the focus on enhancing student leadership skills has remained the primary mission of higher educational institutions. Over the past two decades, college and universities have placed more emphasis on programming related to student leadership abilities (Kelley, 2008) and the literature on leadership abilities of college students also keeps growing (Komives, Lucas & McMahon, 2007; Kouzes & Posner, 2008; Posner, 2004). Hence, although leadership has been studied extensively in political science, applied psychology and business management (Bolman & Deal, 2003; Northouse, 2007), in recent years it has become an emerging topic for educational researchers.

A plethora of leadership programmes are scattered across college campuses and the issues pertinent to enhancing students' leadership skills is becoming a focus in higher educational institutions. Doh (2003) found that more than 60% of the top 50 US business schools publicize that they offer coursework in leadership. Cox, Cekic & Adams (2010) revealed that the engineering education community has also begun to focus on instilling leadership abilities in engineering undergraduates in preparing future engineers. Not only promoting student leadership development in the form of minors, formal undergraduate degree programmes and graduate programmes, doing so through extra or co-curricular activities has also become a major concern of educational institutions (Dugan, 2008; Kelley, 2008).

Although a substantial amount of research has studied student leadership practices, the exact definition of leadership remains an issue due to the existence of various theories and definitions. Among the earlier definitions of leadership was given by Stogdill (1974). Stogdill defines leadership as the effectiveness of personality, the art of inducing compliance, the exercise of influence, a form of persuasion, a power of relationship, an instrument of goal achievement, an effective interaction, and the initiation of structure. Indeed, the definition proposed by Stogdill (1974) covers many of the old-paradigm ideas of leadership. Alternatively, Chemers (1997) describes leadership as a process of social influence in which one person can enlist the aid of others in the accomplishment of a common task. However, Komives, Lucas and McMahon (1998) reviewed over 200 definitions of leadership, but were unable to uncover one definition that they believed adequately explained the concept.

Whereas earlier researchers summarized many of the classical ideas and definitions of leadership, Kouzes and Posner (1995; 2012) explain leadership based on a more contemporary approach. The conceptual framework of leadership proposed by Kouzes and Posner has been chosen as the concept was derived from an extensive global empirical researches conducted throughout decades and it explains the leadership practices from a more contemporary, integrative and practical approach of leadership in the context of today's world (Kouzes & Posner, 2012). They assert that a good leader is a person who can support, integrate, and serve fellows in the accomplishment of goals. Kouzes and Posner (1995, 2007; 2012) further explain that leaders are those who challenge people, inspire a shared vision, enable others to act, set a good example and encourage others to succeed. In addition, they also argue that leadership is a set of skills that can be learnt, and that these skills can be acquired by anyone (Kouzes & Posner, 2007).

This study seeks to investigate the psychometric properties of the second edition of the Student Leadership Practices Inventory (S-LPI) (Kouzes & Posner, 2006), particularly its factorial validity in a different context. After decades of research in leadership, Kouzes and Posner (1995, 2007, 2008) postulate five leadership practices that are omnipresent in the leaders they observed. Initially, they developed the Leadership Practices Inventory (LPI) (Kouzes & Posner, 1988) intending to gauge the leadership practices of employed people. Later on, a student version of the LPI was developed for specific use with college students (Posner & Brodsky, 1992). Generally, the conceptual framework of the development of the LPI and S-LPI remain similar. The five dimensions outlined by Kouzes & Posner (1995, 2007, 2008) in the S-LPI are:

(1) *Modelling the way*: Student leaders set the example by behaving in ways that are consistent with shared values. This is because conveying eloquent speeches about shared values is not enough; exemplary leaders should know that it is their behaviour that earns them respect.

(2) *Inspiring a shared vision*: Student leaders should be able to inspire a shared vision by envisioning the future and enlisting others in a common vision by appealing to their interests and values. This is because visions seen only by leaders are insufficient to create a significant change as people will not follow the leader until they can accept a vision as their own.

(3) *Challenging the process*: Student leaders who lead others to greatness seek and accept challenge. They challenge the process by searching out challenging opportunities to change, improve and grow and by experimenting, taking risks, and learning from mistakes.

(4) *Enabling others to act*: Leadership involves teamwork and a leader is not able to do every task alone. Student leaders enable others to act by fostering collaboration and strengthening people by giving power away, providing choice, and offering visible support.

(5) *Encouraging the heart*: To encourage the heart is to show appreciation for people's contributions in every successful project. By recognizing individual's achievements and offering encouragement, student leaders stimulate and refocus people's energies indirectly.

This research is important as the researchers intend to test the validity (factorial validity) and applicability of the Student Leadership Practices Inventory (Kouzes & Posner, 2006) in the Malaysian context. This is because no documented literature has been found to date on the study of factorial validity of the S-LPI in Malaysia or its counterpart Asian countries. As the S-LPI was originally developed in the US, an additional validation study on a different population will help to verify the measure's utility beyond that of the inventory developers' setting. In general, as the S-LPI was developed based on five latent factors (Kouzes & Posner, 1995, 2007, 2008), the researchers hypothesize that the findings from this study will yield the same result.

Additionally, it is believed that this test validation study is significant in that it could accumulate evidence to support the appropriateness, meaningfulness and usefulness of the specific inferences made based on the S-LPI test scores. Moreover, this research tries to gather construct-related evidence, particularly the factorial validity of the instrument as specified by the American Educational Research Association (AERA), American Psychological Association (APA) and National Council on Measurement in Education (NCME) (1999). According to these organisations, such standards require that the validation process of a measure be on-going, with continuing efforts to establish the usefulness of the measure for specific populations and purposes.

2. Method

2.1 Participants

In total, 303 undergraduate students (n=303) participated in this study. The age of the respondents ranged from 19 to 26 years (M = 21.39, SD = 1.115). However, 37 respondents did not report their age. The respondents consisted of 35.1% male students (n = 105) and 64.9% females (n = 194). Meanwhile, 4 of the respondents did not indicate their gender. The sample comprised of students from various faculties and all of them were ethnic Malay.

2.2 Measure

The respondents completed the second edition of the Student Leadership Practices Inventory (SLPI: Kouzes & Posner, 2006). The S-LPI is a leadership tool designed specifically for students and young people, and

developed based on one of the most prominent and well-regarded leadership frameworks for youth leadership (Kouzes & Posner, 2008). It looks at the specific behaviours and actions of students when they are at their personal best as leaders (Posner & Brodsky, 1992; Kouzes & Posner, 2008). These key behaviours are categorized into five leadership practices: (1) model the way; (2) inspire a shared vision; (3) challenge the process; (4) enable others to act; (5) encourage the heart. Each of these components is tapped through 6 items, making up the total of 30 items.

In this instrument, respondents are asked to consider how frequently they engage in each of the behaviours using a five-point Likert scale, with (1) indicating rarely or seldom and (5) indicating very frequently or almost always. The S-LPI is available in two versions: self- and observer-report. In this research the self-report version of the S-LPI was used.

Cronbach's alpha coefficients of internal reliability for each practice have been reported in the literature at 0.70 or greater (Posner, 2004). A previous study has found the S-LPI to have sound psychometric properties (Posner, 2010). Numerous researchers have successfully used a composite measure of the five leadership practices to represent transformational leadership (Bell-Roundtree and Westbrook, 2001; Wong, 2007; Ferrara, 2008).

Although no studies were found on the examination of the factorial structure of S-LPI, a few studies examining the factorial structure of the LPI (a version for employed people) were found. The findings of these studies yielded the same result: five interpretable factors were obtained consistent with the five subscales of the LPI (Jurkowski, 1997; Kouzes & Posner, 2002; Stuart, 1999). It is worthy to note that, the LPI and S-LPI are grounded on the same theoretical framework (Posner & Brodsky, 1992).

2.3 Procedures

The participants from one public university in Malaysia completed the self-report measure of the S-LPI during the co-curricular activity programmes on a voluntary basis. All the participants were fully de-briefed upon completion. Meanwhile, the data were analysed by using Statistical Package for Social Science (SPSS) software version 19.

3. Results and discussion

3.1 Phase 1: Checking the assumptions

In phase 1, preliminary analyses were conducted to assess the suitability of the data for principal components analysis (PCA). Two main issues were investigated: sample size requirement and the strength of the relationship among the items (Pallant, 2007; Tabachnick & Fidell, 2007). Tabachnick and Fidell (2007) recommend a minimum ratio of 5 to 1; that is 5 cases for each item to be factor analysed. As the data for this study consisted of 303 cases (n=303) and 30 items, it fulfils the sample size criterion. The screening process also revealed that no violation of normality, linearity, multicollinearity and singularity were observed.

Meanwhile, a few outputs were generated to check the overall measures of inter-correlation and factorability of the data: (1) correlation coefficients matrix, (2) Bartlett's test of sphericity, and (3) the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy. It was observed that the strength of the inter-correlations among the items was also satisfactory as most of the correlation coefficients were greater than .3 (Tabachnick & Fidell, 2007). Similarly, the Bartlett 's test of sphericity and the Kaiser-Meyer-Olkin (KMO) measure of sampling also satisfied the assumption of the appropriateness of factor analysis as Bartlett 's test was significant ($p < .05$) and the KMO index was .922. As the Bartlett test was significant, it indicates that the correlation matrix has significant correlations among at least some of the items (Hair, Black, Babin & Anderson, 2010). Similarly, as the KMO index was larger than .6, it reached the minimum value for a good factor analysis (Hair et al., 2010). On account of these preliminary analyses, it revealed that the study data were suitable for the factor analysis.

3.2 Phase 2: Defining factors and assessing overall fit

For the initial stage, a principal components analysis (PCA) with orthogonal rotation (varimax) was conducted to derive factors and assess overall fit. Although the researchers already knew that there were five factors that underlie this construct, this exploratory approach (varimax) was intended to get an empirical summary regarding the maximum number of factors (Field, 2005; Tabachnick & Fidell, 2007). A few techniques were used to assist in the decision concerning the number of factors to extract: (1) Kaiser's latent root criterion, (2) a priori criterion, (3) scree test criterion, and (4) parallel analysis criterion.

The most commonly used technique in factors extraction is Kaiser's rule. Using this rule, only factors with eigenvalues greater than 1 are considered significant and retained for further analysis (Hair et al., 2010). Based on the output generated, it revealed that this construct had a 5-factor solution as there were 5 components that had an eigenvalue greater than 1 and these 5 components accounted for 56.588% of the total variance explained.

A priori criterion is a reasonable criterion under certain circumstances, especially if the researcher already knows how many factors to extract before undertaking the factor analysis (Hair et al., 2010). As the researchers were attempting to replicate other researchers' work, it was hypothesized that this analysis would extract a 5-factor solution as grounded by the scale developers' conceptual framework on leadership practices (Posner & Brodsky, 1992).

At the same time, visual inspection of the scree plot was done to examine the number of possible structures. The scree test result indicated that 5 was the maximum number of factors to extract as there were 5 points above the elbow; the point at which the curve changes direction and becomes horizontal (Hair et al., 2010; Pallant, 2007).
In addition, the Monte Carlo PCA for Parallel Analysis programme was also used to compare the size of eigenvalues with those obtained from a randomly generated data set of the same size. In such a case, only those eigenvalues that exceed the corresponding values from the random data set are retained (Pallant, 2007; Tabachnick & Fidell, 2007). The comparison of eigenvalues from PCA and criterion values from parallel analysis is shown in Table 1. The results show that only 3 components were retained as there were only 3 components (from PCA) that have eigenvalues greater than the criterion value from parallel analysis.

Table 1. The comparison of eigenvalues from PCA and criterion values from parallel analysis

Component number	Actual eigenvalue from PCA	Criterion value from parallel analysis
1	10.493	1.642
2	2.499	1.550
3	1.536	1.479
4	1.295	1.416
5	1.154	1.364

Based on the results obtained from Kaiser's latent root criterion, a priori criterion and scree test criterion there were 5 possible factors to retain. Nonetheless, the parallel analysis criterion showed that there were only 3 possible factors. To this end, the researchers chose to retain 5 factors as the main objective of the study was to replicate the test developers' work and to explore the established structure with the current community. The decision to retain a 5-factor solution was deemed reasonable as the researchers strove to have the most representative and parsimonious set of factors possible (Hair et al., 2010; Pallant, 2007). Furthermore, Hair et al. (2010) assert that in choosing the number of factors, parsimony is important and the common factorial structure is best in a well-specified theoretical framework.
Finally, in selecting the final factor solution, the researchers evaluated the (rotated) factor loadings significance for each item in determining that item's contribution for a particular structure (Field, 2005; Hair et al., 2010). Factor loadings with an absolute value greater than .4 are considered to meet the minimum level for the interpretation of structure (Stevens, 1992). An examination of the factors loading showed that all items loaded significantly on a particular factor except item 'challenge 4'. This item had no significant loading on any factor.

3.3 Phase 3: Interpreting the factors and respecifying the factor model

Further, the decision between orthogonal and oblique rotation was made as soon as the number of reliable factors was apparent (Tabachnick & Fidell, 2007). In this stage, oblique rotation was chosen because the theoretically important underlying dimensions were not assumed to be uncorrelated with each other (Hair et al., 2010; Tabachnick & Fidell, 2007). The inventory developers also postulate that the factors share some common variance empirically. In the stage of refining the factor model, the researchers deleted the item 'challenge 4' for further analysis as its factor loading was not significant. Hence, in the next analysis, the item 'challenge 4' was removed and the analysis was repeated again using oblique rotation (direct oblimin) and extracting a 5-factor solution.
After respecifiying the factor model, the results from 29 S-LPI items showed that the structure improved considerably. There were five components with eigenvalues exceeding 1, and the 5-factor solution accounted for 57.282% of the variance. All the items fit well with the other items in its component as all the communalities were greater than .3 (Pallant, 2007).
The pattern and structure matrix for PCA with oblimin rotation of a 5-factor solution of the SLPI items are presented in Table 2. The results from the pattern matrix a are preferable for interpretative reasons because it contains information about the unique contribution of an item to a factor (Field, 2005; Hair et al., 2010; Tabachnick & Fidell, 2007). Although the researchers preferred to interpret the pattern matrix, the structure matrix is also reported as it can be a useful means to double check the pattern matrix.
The first factor explained 35.051% of the variance in student leadership practices. There were six items loaded on this factor: item challenge 1, inspire 6, challenge 2, challenge 3, inspire 5, challenge 6 and challenge 5. In this analysis, the item challenge 5 loaded on no factor, but loaded highly significantly on structure matrix. Thus, the item challenge 5 was retained in this factor. Meanwhile, although the item inspire 5 loaded on this factor, in the structure matrix it had a cross-loading to the fourth (model the way) and fifth (inspire a shared vision) components. Therefore, the item inspire 5 was excluded from this factor and interpreted as an indicator for the fifth component. Item inspire 6 was also loaded highly significantly (.774) in this factor and showed no cross-loading on other factors. The structure matrix output also revealed the same finding. In this case, the researchers

decided to retain the item inspire 6 in this factor. Hence, the items challenge 1, inspire 6, challenge 2, challenge 3, challenge 6 and challenge 5 were interpreted as an indicator for the 'challenge the process' factor.

The second factor included 6 items with loadings exceeding .40, and accounted for 8.580% of the variance. The six items were: enable 5, enable 4, enable 6, enable 3, enable 2, and enable 1. These items clearly refer to the 'enable others to act' factor. Although the item enable 1 has a cross loading with the fifth component (loading = .442), it loaded slightly stronger (.443) on the second factor. Thus, all these items were retained under the 'enable others to act' factor.

Six items loaded highly (.562 - .751) on the third factor and this factor accounted for 5.217% of the variance. The structure matrix also yielded the same finding, with all the loadings greater than .7. Items encourage 5, encourage 3, encourage 6, encourage1, encourage 4, and encourage 2 formed this factor and captured the 'encourage the heart' factor.

The fourth factor consisted of six items with loading exceeding .40 and explained 4.465% of the variance. The six items consisted of model 2, model 5, model 4, model 6, model 1 and model 3 of student leadership practices inventory. These items mapped into the 'model the way' factor.

The fifth factor consisted of four items with loadings over .40 and explained 3.968% of the variance. The items refer to inspire 3, inspire 2, inspire 4, and enable 1. However, as the item enable 1 loaded higher on the 'enable others to act' factor, it was further excluded from this component. Meanwhile, the item inspire 1 had no significant loading and loaded on no factor in the pattern matrix. Nonetheless, it overlapped with the first, fourth and fifth factors in the structure matrix. The researchers retained the item inspire 1 in this factor due to its meaningfulness to the theory. In contrast, the item inspire 5 loaded on the first component. However, it overlapped with the first, fourth and fifth factors in the structure matrix. Although it indicated cross loadings, it was retained in this component due to its contribution to the conceptual foundation. Furthermore, Hair et al. (2010) assert that any decisions on the appropriateness of a factor solution are best guided by conceptual rather than empirical bases. Hence, the items inspire 3, inspire 2, inspire 4, inspire 5, and inspire 1 were retained in the fifth factor and captured the 'inspire a shared vision' factor.

In summary, the 'enable others to act', 'encourage the heart' and 'model the way' factors present no difficulty in interpreting the factor structure as the right items loaded significantly on their components respectively. Conversely, for the 'challenge the process' factor, it added one additional item, that is the item inspire 6, and this item was retained in this factor as it loaded highly significantly (.774) on this factor. Meanwhile, for the 'inspire a shared vision' factor, there were two items (inspire 1and inspire 5) that overlapped with other factors, but these items were retained in this factor due to their meaningful contribution to the theory.

3.4 Phase 4: Reliability analysis

The reliability test was conducted based on the final 5-factor solution result that consists of 29 items relating to student leadership practices. The reliability coefficients for each factor are presented in Table 3. All alpha coefficients were satisfactory as the value for each subscale is larger than .7 (ranging from.760 to .858) indicating that the newly formed subscales are internally consistent (Field, 2005; Pallant, 2007).

3.5 Discussion

The dimensional structure obtained in this investigation documents that the S-LPI is a multidimensional scale tapping into various dimensions of student leadership practices. In the initial stage, the structure of the SLPI was explored using PCA with orthogonal (varimax) rotation (Field, 2005; Tabachnick & Fidell, 2007). Based on the findings yielded by Kaiser's latent root criterion, a priori criterion and scree test criterion, 5 possible factors were retained. These 5-factor solutions explained 56.571% of the variance. On the other hand, with the threshold set at .4 for significant factor loadings, all items loaded significantly on their respective factor except the item challenge 4. This item refers to 'When things do not go as we expected, I ask, "What can we learn from this experience?"'. The factor loading of this item was not significant. Thus, this item was removed from the next analysis.

After deriving possible factors, the PCA was conducted once again with oblique (direct oblimin) rotation (Hair et al., 2010; Tabachnick & Fidell, 2007). In this stage, the item challenge 4 was removed and a 5-factor structure was extracted. The results showed that these 5 factors explained 57.260% of the variance. The first component mapped onto the 'challenge the process' factor. It added one additional item; the item inspire 6, and this item was retained in this factor as it loaded highly significantly on this factor. The item inspire 6 refers to 'I speak with conviction about the higher purpose and meaning of what we are doing'. In essence, the 'challenge the process' factor covers the items that deal with a leader's contribution in challenging the system to get new inventions or systems adopted. Therefore, item inspire 6 was retained in the 'challenge the process' factor for the current context.

The second, third and fourth components practically supported the conceptual framework as the right items loaded significantly on their components respectively. These factors refer to the 'enable others to act', 'encourage the heart' and 'model the way' components respectively.

Table 2. Oblique Rotation of Components Analysis Factor Matrix

PATTERN MATRIX

		OBLIQUE ROTATED LOADINGS*					
		Factor					
Item	**Description of the item**	**1**	**2**	**3**	**4**	**5**	**Communality**
challenge1	Develop skills and abilities	.798					.665
inspire6	Communicate purpose	.774					.639
challenge2	Help others take risks	.773					.656
challenge3	Search for innovative ways	.632					.504
inspire5	Positive in talking group aspirations	.503					.587
challenge6	Take initiative in experimenting	.492					.546
challenge5	Make specific plans						.473
enable5	Give people choice		.806				.637
enable4	Support others' decisions		.756				.640
enable6	Provide leadership opportunities		.708				.592
enable3	Treat others with respect		.663				.590
enable2	Actively listen		.489				.541
enable1	Foster cooperative relationships		.443			-.442	.528
encourage5	Celebrate accomplishments			-.751			.573
encourage3	Provide support and appreciation			-.742			.590
encourage6	Creatively recognize people			-.716			.632
encourage1	Praise people			-.695			.562
encourage4	Publicly recognize people			-.618			.553
encourage2	Encourage others			-.562			.633
model2	Align others with principals				.752		.570
model5	Build consensus on values				.687		.564
model4	Get feedback about actions				.682		.550
model6	Talk about values and principles				.646		.549
model1	Set personal example				.505		.336
model3	Follow through on promises				.493		.508
inspire1	Communicate the future						.506
inspire3	Talk about future vision					-.542	.678
inspire2	Describe ideal capabilities					-.497	.594
inspire4	Show others how their interest can be realized					-.480	.615

Meanwhile, for the fifth factor (inspire a shared vision), there were two items (inspire 1 and inspire 5) that overlapped with other factors, but these items were retained in this factor due to their meaningful contribution to the theory. The items inspire 1 and inspire 5 refer to 'I look ahead and communicate about what I believe will affect us in the future' and 'I am upbeat and positive when talking about what our organization aspires to accomplish' respectively. Generally, the 'inspire a shared vision' factor covers the items that deal with the student's competency in inspiring their peers with their vision.

Thus, although a few items of the S-LPI did not achieve an optimal structure, the findings showed that the S-LPI is a sound and reliable instrument in assessing the student leadership practices of the current community as it retained the 5-factor structure as grounded by its theoretical framework. Furthermore, the reliability analysis also showed that it has good internal consistency with an alpha coefficient larger than .7 for each subscale (Pallant, 2007; Green & Salkind, 2005).

STRUCTURE MATRIX

		OBLIQUE ROTATED LOADINGS*				
		Factor				
Item	**Description of the item**	**1**	**2**	**3**	**4**	**5**
challenge1	Develop skills and abilities	.803				
challenge2	Help others take risks	.802			.420	
inspire6	Communicate purpose	.789				
challenge3	Search for innovative ways	.697			.431	
inspire5	Positive in talking group aspirations	.668			.476	-.521
challenge6	Take initiative in experimenting	.667			.503	-.401
challenge5	Make specific plans	.527	.456		.477	-.404
enable5	Give people choice		.786			
enable4	Support others' decisions		.772			
enable6	Provide leadership opportunities		.749	-.405		
enable3	Treat others with respect		.740	-.426		
enable2	Actively listen		.621	-.421		-.464
enable1	Foster cooperative relationships		.561			-.533
encourage6	Creatively recognize people	.466		-.760		
encourage3	Provide support and appreciation			-.759		
encourage5	Celebrate accomplishments			-.744		
encourage2	Encourage others		.572	-.721		
encourage4	Publicly recognize people	.409		-.719	.405	
encourage1	Praise people		.432	-.717		
model5	Build consensus on values				.734	
model2	Align others with principals				.728	
model4	Get feedback about actions	.455			.723	
model6	Talk about values and principles				.675	-.441
inspire1	Communicate the future	.514			.595	-.468
model1	Set personal example				.564	
model3	Follow through on promises				.552	
inspire3	Talk about future vision	.572		-.443	.457	-.673
inspire2	Describe ideal capabilities	.510			.527	-.637
inspire4	Show others how their interest can be realized	.574		-.410	.475	-.626

** Factor loadings less than .400 have not been included and items have been sorted by loadings on each factor*

Table 3. Reliability analysis of the 5-factor solution for the S-LPI

Factor	**Cronbach's alpha**	**N of items**	**Sample item**
Challenge the process	.817	6	I look for ways that others can try out new ideas and methods
Enable others to act	.821	6	I foster cooperative rather than competitive relationships among the people I work with
Encourage the heart	.841	6	I praise people for a job well done
Model the way	.760	6	I set a personal example of what I expect from other people
Inspire a shared vision	.858	5	I describe to others in our team what we should be capable of accomplishing

4. Conclusion

In summary, the findings revealed that the S-LPI retained a 5-factor solution with Malaysian undergraduate students. An optimal structure existed for the 'enable others to act', 'encourage the heart' and 'model the way' factors. However, the robustness of the 'challenge the process' and 'inspire a shared vision' factors should be interpreted with caution. Firstly, for the 'challenge the process' factor, the item challenge 4 may need revision as it had no significant loading on any factor. Secondly, the credence of the item inspire 6 also is questionable in the current context as it loaded highly significantly on the 'challenge the process' factor. Therefore, although the findings of the study support the conceptual basis of this instrument, the 'challenge the process' and 'inspire a shared vision' factors should be interpreted with a few considerations in defining the best structure model.

Meanwhile, a little caution should be taken in making a generalization from these findings. First, the data were collected at one public Malaysian university and comprised ethnic Malay students only. Thus, the restriction of the sampling to one community of a campus invites some uncertainty in terms of the generalizability of the findings. The results need to be validated in broader campus settings and with more diverse student groups. In

addition, as the study assessed the factorial validity of the S-LPI only, further studies can be conducted on other issues of psychometric properties of S-LPI particularly its construct-related validity.

In conclusion, despite the limitations, this study represents the very first in the literature to study the factorial validity of the S-LPI in the Malaysian context and provides empirical evidences for its feasibility on this student population. This study further validates the professional standards for educational and psychological testing as outlined by the AERA, APA and NCME (1999) in which such standards require the validation process to involve continuing efforts to establish the usefulness of a measure for specific populations and purposes.

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