The Development of the Service-Learning Outcomes Measurement Scale—Short Version (S-LOMS-SV) and Its Preliminary Validation

Ka Hing Lau
Centre for Innovative Service-Learning, General Education Office, Hong Kong Baptist University

Lisa Lam
Centre for Innovative Service-Learning, Hong Kong Baptist University

Robin Stanley Snell
Department of Management, The Hang Seng University of Hong Kong

Carol Hok-Ka Ma
Centre for Experiential Learning, Singapore University of Social Sciences

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Desarrollo de la Escala de Medición de Resultados del Aprendizaje-Servicio, Versión Corta (S-LOMS-SV) y su Validación Preliminar

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Abstract

This article describes the development and validation of a short version of the Service-Learning Outcomes Measurement Scale, the S-LOMS-SV. The original Service-Learning Outcomes Measurement Scale (S-LOMS) is a previously validated 56-item instrument measuring developmental outcomes in 11 domains under four overarching categories, especially appropriate for use in Hong Kong and related contexts.

In developing SLOMS-SV, 14 experienced service-learning researchers and practitioners reviewed the full-length S-LOMS for content validity and identified items with potential for inclusion in a shortened version. Through an iterative process, 21 items maintaining the original scale's factor structure were selected for the S-LOMS-SV. Validity and internal consistency analyses using preexisting student data sets demonstrated that the S-LOMS-SV has robust psychometric properties that match those of the full-length S-LOMS. Theoretical and practical implications and next steps are discussed. The 21-item S-LOMS-SV is included in the Appendix.

Keywords: *service-learning, student developmental outcomes, quality assurance, assessment tools, scale reduction*

Resumen

Este artículo describe el desarrollo y validación de una versión corta de la Escala de Medición de Resultados de Aprendizaje-Servicio (S-LOMS-SV). La Escala de Medición de Resultados de Aprendizaje-Servicio original (S-LOMS) es un instrumento previamente validado y contiene 56 ítems que miden resultados del desarrollo de los estudiantes en 11 dominios, con cuatro categorías generales para ser utilizado en Hong Kong y contextos similares.

Esta versión abreviada de SLOMS-SV fue revisada por 14 investigadores y profesionales experimentados en aprendizaje y servicio. De esta manera, se pudo determinar la validez de las preguntas y se identificaron elementos a ser incluidos en una versión más corta de este instrumento. A través de un proceso iterativo, se seleccionaron 21 ítems para el

S-LOMS-SV que mantenían la estructura factorial de la escala original. Después de realizar un análisis de validez y consistencia interna utilizando datos de estudiantes preexistentes, se demostró que el S-LOMS-SV tiene propiedades psicométricas sólidas que coinciden con las características de la versión original del S-LOMS. Se discuten las implicaciones teóricas, prácticas y los próximos pasos. La versión corta de 21 elementos del S-LOMS-SV se incluye en el Apéndice.

Palabras clave: *aprendizaje y servicio, resultados del desarrollo de estudiantes, aseguramiento de la calidad, herramientas de evaluación, reducción de escala*

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Instituto de Aprendizaje y Servicio
Universidad San Francisco de Quito
Ecuador

Service-learning, as an experiential pedagogy, is defined as

> course-based, credit bearing educational experience in which students (a) participate in an organized service activity that meets identified community needs, and (b) reflect on the service activity in such a way as to gain further understanding of course content, a broader appreciation of the discipline, and an enhanced sense of civic responsibility. (Bringle & Hatcher, 1995, p.112)

The benefits of service-learning for students have been well documented in past literature. They include better academic performance, cognitive skills, empathy, civic learning, self-awareness, and career insight and development (Astin et al., 2000; Celio et al., 2011; Conway et al., 2009; Lau & Snell, 2022; Salam et al., 2019; Warren, 2012; Yorio & Ye, 2012). An emerging body of research also indicates that service-learning gives rise to beneficial community impacts (Snell & Lau, 2022).

Originating in the United States (Kenny & Gallagher, 2002), service-learning was introduced to Hong Kong and other jurisdictions in Asia, including Singapore, Taiwan, the Philippines, and Indonesia, during the late 20th century and the first two decades of 21st century, reflecting that its adoption in higher education has become an international phenomenon (Ma, 2018; Xing & Ma, 2010). Nowadays, all public universities and some private universities in Hong Kong have adopted service-learning as part of their undergraduate curriculum (Lau & Snell, 2021) and have recognized its value in developing attributes that complement formal academic training. For example, Hong Kong Baptist University uses service-learning as a means for providing whole-person education (Centre for Innovative Service-Learning, 2024). Some universities in Hong Kong, such as Lingnan University and The Hong Kong Polytechnic University, stipulate service-learning as a graduation requirement for undergraduate programs.

Given that considerable resources are now being invested in service-learning, school administrators and instructors, along with other stakeholders such as donors, are eager to assess its effectiveness in yielding developmental benefits for students. This, coupled with the desire for continuous improvement of program design and execution, has become a central concern in quality assurance.

Despite strong demand for service-learning, until the development of the Service-Learning Outcomes Measurement Scale (S-LOMS), there was no standardized and well-validated assessment tool designed to systematically capture student developmental outcomes arising from service-learning in Hong Kong (Snell & Lau, 2020). Prior to the development of S-LOMS, many studies on student development in Hong Kong adopted and translated various measurement scales from the West, incurring two associated issues.

One of these issues is that scales originally developed in the West may not take the cultural and institutional backgrounds of higher education in Hong Kong into account and hence may fail to address local educational priorities. In a paper reporting the development of S-LOMS, Snell and Lau (2020) argued that the ideological context for service-learning in Hong Kong is considerably different from where it originated. Service-learning in the United States was based on John Dewey's ideas about social action for building democratic values and human rights (Giles & Eyler, 1994; Saltmarsh, 2005). In contrast, service-learning in Hong Kong has been influenced by Chinese educational philosophy that is largely underpinned by Confucianism, emphasizing spirituality, self-cultivation, harmonious relationships, and preservation of the status quo (Lee, 2004). As a result, the purposes of service-learning in Hong Kong differ from its original aims in the United States in three main respects. First, there is greater emphasis on the development of professional skills, reflecting a more instrumental ethos in education. Second, there is more emphasis on self-reflection and self-improvement to reflect the moral values associated with Confucian self-cultivation. Third, although civic engagement is strongly valued, the associated aims are depoliticized by focusing on civic duty and moral development rather than on furthering social justice and democratic politics. This distinct mixture of local factors has oriented the design and implementation of service-learning in Hong Kong toward desired development outcomes for students that may not be adequately captured by scales that have originated in the West.

The second issue is that until the advent of S-LOMS, researchers on service-learning in Hong Kong used a variety of scales for measuring outcomes. Without a standard instrument, this plurality rendered

longitudinal and cross-institutional comparisons difficult and may even have indirectly impeded the advancement of service-learning in Hong Kong.

The Content of the Service-Learning Outcomes Measurement Scale

A cross-institutional project was instituted by four public universities in Hong Kong, funded by the University Grants Committee (UGC; Lau & Snell, 2020a). One of the goals of the project was to establish a valid, reliable, and effective assessment tool to measure student developmental outcomes arising from service-learning. Against this backdrop, S-LOMS was developed. This began with an extensive literature review of service-learning models and measurement scales. The literature review generated a model of student developmental outcomes arising from service-learning, composed of four overarching categories with 11 developmental domains. The first overall category was knowledge application, as a single cognominal domain. The second overall category was personal and professional skills, subsuming four development domains—namely, creative problem-solving skills, relationship and team skills, self-reflection skills, and critical thinking skills. The third overall category was civic orientation and engagement, subsuming three developmental domains—namely, community commitment and understanding, caring and respect, and sense of social responsibility. The fourth overall category was self-awareness, subsuming three developmental domains—namely, self-efficacy, self-understanding, and commitment to self-improvement.

S-LOMS was created after several rounds of development and testing (Lau & Snell, 2020a). The full-length version has 56 items across the above 11 developmental domains and was designed to be administered under a pretest–posttest approach, self-reported by students. S-LOMS has been rigorously tested, achieving high levels of face validity, construct validity, criterion validity, test–retest validity and internal consistency (Lau & Snell, 2020a, 2020b; Snell & Lau, 2020). It has also been validated against a Singapore sample in a cross-cultural comparison study with satisfactory results (Lau & Snell, 2021). Furthermore, S-LOMS has been translated into Chinese language through back-translation methodology with good validation results (Lau et al., 2022).

Besides being a valid and reliable assessment tool, the full-length S-LOMS measures student development across domains that are especially salient to Hong Kong culture and educational institutions. Furthermore, validation studies have established that researchers and practitioners need not administer the full version of S-LOMS if they wish to select particular domain scales to address their own research interests and teaching needs (Lau & Snell, 2020a). With the above merits, S-LOMS is currently being used by various public and private universities in Hong Kong, along with some institutions in other locations in Asia, such as the Philippines and Singapore.

The Need for Shortening S-LOMS for Broader Use

Although S-LOMS is a well-validated measurement tool with robust psychometric properties and can be selectively administered, it may also be regarded as long, especially if administered in conjunction with other measures. Full-length administration may entail survey fatigue for respondents and increase attrition between the pretest and posttest stages. Past literature reveals that higher response rates and better data quality for course evaluation can be obtained through administering fewer survey questions within a reasonable time, thereby providing higher motivation to students to complete (Nicolaoua & Atkinsona, 2019; Williamson & Wang, 2023). Selective administration to focus on particular developmental domains, although possible (Lau & Snell, 2020a), entails judgment processes that administrators may regard as overcomplex. The implication is that a more concise assessment tool that nonetheless retains coverage of the full scope of desired developmental outcomes and thereby continues to meet quality assurance requirements for school management and program donors has become necessary and urgent. We envisaged that a short form of S-LOMS that is well validated could fulfill this need.

The Current Study

The above considerations pointed to the need for a scale reduction study for S-LOMS, to enable student developmental outcomes arising from service-learning to be measured more efficiently for both quality assurance and research purposes. The research team took account of previous literature (Coste et al., 2013; Smith et al., 2000), which argued that when engaging in scale reduction, item selection should not solely rely on statistical criteria such as item–total correlation. For the original 56-item scale and the short form to be comparable in content coverage while retaining content validity, item reduction should begin by shortlisting items from the original scale based on a content analysis. The current study thus began with a content validity survey, followed by statistical validation of the short version (S-LOMS-SV) by using preexisting data collected in previous studies of S-LOMS development and validation (Lau & Snell, 2020a, 2021, 2022), as reported below.

The Content Validity Survey

Method

The purpose of the content validity survey (Haynes et al., 1995) was to shortlist items according to the degree to which they were perceived as relevant and representative of the target constructs serving the purposes of the 56-item S-LOMS scale. The research team sought to collect expert opinions on each of the 56 items in terms of relevancy to their corresponding assigned factor, as the first step toward shortlisting items on the basis of their content validity, before empirical validation.

An expert committee was established, consisting of 14 seasoned service-learning researchers and practitioners from Asia and North America (eight females and six males), based on the guidelines of Grant and Davis (1997). They, as key informants, were selected and invited on the basis of their training, experience, qualifications, and expertise in service-learning design, implementation, and research, as well as in assessment scale development. Among the 14 members, 12 were very familiar with the Hong Kong service-learning context, and three were currently based in Singapore, where the 56-item S-LOMS has been validated and where institutions have also been strongly influenced by Confucianism (Lau & Snell, 2021).

Specifically, six of the members had experience in overseeing service-learning development and delivery at a senior management level, and all of them had several years of teaching experience in service-learning. Eleven of the members had published research papers on service-learning, and many of them had been involved in service-learning evaluation at both the course and institutional levels. Among the three Anglo-American members, two had experience of teaching service-learning in Hong Kong, and the third had served as an adviser for the service-learning committee in one of the Hong Kong universities. Accordingly, we considered that all the members were well qualified for reviewing S-LOMS while taking local factors into account. Table 1 summarizes the committee members' background and experience in service-learning.

Table 1.

The Background and Service-Learning Experience of the Expert Committee Members

No	Sex	Ethnicity	Academic Discipline	Place(s) of Conducting Service-Learning	Senior Service-Learning Management Experience	Service-Learning Teaching Experience	Published Service-Learning Research
1	Female	Filipino	Humanities	Hong Kong	Y	Y	Y
2	Male	Chinese	Chinese medicine	Hong Kong		Y	Y
3	Male	Chinese	Social sciences	Hong Kong	Y	Y	Y
4	Female	Chinese	Management	Hong Kong		Y	Y
5	Female	Chinese	Management	Hong Kong		Y	Y
6	Female	Chinese	Training & development, industry practitioner	Hong Kong		Y	Y
7	Female	Chinese	Management	Hong Kong		Y	Y
8	Female	Chinese	Marketing	Hong Kong, Singapore		Y	
9	Male	Anglo-American	Science	Hong Kong		Y	
10	Female	Chinese	Education	Singapore	Y	Y	Y
11	Male	Anglo-American	Education	United States, South Africa	Y	Y	Y
12	Male	Anglo-American	Education	Hong Kong, United States	Y	Y	Y
13	Female	Chinese	Education	Singapore		Y	
14	Male	Chinese	Education	Hong Kong	Y	Y	Y

The invitation letters explained the purpose of the project, that is, to develop a short version of S-LOMS that would match the psychometric properties of the full-length scale. Invitees were informed that the content validity survey would be administered online on an individual basis and would take around one hour to complete. All invitees accepted their invitation.

Measurement

The content validity survey presented the 56 items of S-LOMS in small batches, alongside the definitions of their corresponding domain and overarching category. Members were asked to rate two statements about each item on a four-point scale (strongly disagree, slightly disagree, slightly agree, and strongly agree). The statements were (1) "this item is core to the domain that it represents," indicating the level of perceived relevancy of the item to its domain, and (2) "I would prioritize retaining this item in preference to other items within the same domain," indicating the extent of preference for retaining the item. In the event of choosing "strongly disagree" in rating statement 2, signifying a strong preference of dropping the item, members were asked to provide reasons. After completing the rating for all the items, members were invited to provide any other comments or suggestions.

Procedure and Analysis

All members completed the survey. Based on their ratings, two indices similar to the content validity index (CVI; Almanasreh et al., 2019) were produced for each item. Both indices were calculated by dividing the number of affirmative responses (slightly agree and strongly agree) by the total number of

members. A relevancy index was based on the responses to statement 1, and a retention index was based on the responses to statement 2. Guided by past literature (Lynn, 1986), items were deemed to have good content validity if they met the threshold of 78%. In addition, the qualitative data, comprising members' reasons for not retaining particular items, along with their general comments and suggestions, were consolidated. The research team met to review the data and determine the shortlisted items. The following criteria were adopted for shortlisting: (a) good relevancy and retention index scores, (b) good psychometric properties, such as item–total correlation in prior validation studies, (c) preserving content coverage as much as in the original S-LOMS, (d) being concise in terms of scale length, and (e) assigning low priority for those items that can belong to more than one domain. After the shortlisting was performed, the relevancy and retention indices for the entire short version of the scale were calculated by averaging the index scores of each of the shortlisted items, indicating the overall content validity of the shortened scale.

Results

All 56 items of the original S-LOMS obtained satisfactory relevancy index scores of above 79%. Only three items obtained below 78% retention index scores—namely, "I can make connections between theory and practice" (71%), "I can identify challenges in the community" (71%), and "I am satisfied with my achievement so far" (71%). Overall, the index scores signified that the original S-LOMS was perceived by the expert committee members to have a very good content validity. During item review, the research team referred to the five aforementioned shortlisting criteria in arriving at a set of 21 retained items for S-LOMS-SV, as shown in Table 2.

Table 2.

The Finalized 21-Item Version of the S-LOMS-SV and Their Content Validity Survey Results

Item	Overarching Category/Item	Relevancy Index	Retention Index
	Knowledge Application	*88%*	*90%*
1	I know how to apply what I learn in class to solve real-life problems.	86%	86%
2	I am able to apply/integrate classroom knowledge to deal with complex issues.	93%	93%
3	I know how to transfer knowledge and skills from one setting to another.	86%	93%
	Personal & Professional Skills	*96%*	*94%*
4	I am able to generate original ideas.	100%	86%
5	I feel confident in identifying the core of a problem.	86%	93%
6	I often modify my strategies to solve a problem when the situation changes.	100%	100%
7	I am good at building relationships between people.	100%	100%
8	I am good at resolving conflicts.	93%	86%
9	I am confident in leading others toward common goals.	100%	93%
10	I reflect on myself regularly.	93%	93%
11	I often look at complex issues from different angles.	100%	100%
	Civic Orientation & Engagement	*100%*	*96%*
12	I will contribute my abilities to make the community a better place.	100%	100%
13	I can identify issues that are important for a disadvantaged community.	100%	100%
14	I respect the needs of people from different backgrounds.	100%	93%
15	I care about others.	100%	93%
16	I observe others' feelings and emotions.	100%	93%
17	I believe that taking care of people who are in need is everyone's responsibility.	100%	100%
	Self-Awareness	*100%*	*95%*
18	I am positive about myself.	100%	93%
19	I know my strengths and weaknesses.	100%	93%
20	I have a clear understanding of my own values and principles.	100%	100%
21	I am always motivated to learn.	100%	93%
	The S-LOMS-SV	*97%*	*94%*

Within S-LOMS-SV, the original factor structure of S-LOMS has been preserved. There are four overarching categories—namely, knowledge application (three items), personal and professional skills (eight items), civic orientation and engagement (six items), and self-awareness (four items). The main trade-off is that developmental domain analysis is not possible for S-LOMS-SV, as most domains only contain one or two items. The research team has nonetheless ensured that S-LOMS-SV items cover all the original developmental domains, so as to preserve content coverage as much as possible.

Each of the 21 items in S-LOMS-SV has relevancy and retention index scores of 86% or above. The overarching categories have relevancy index scores of 88% or above and retention index scores reaching at least 90%. Overall, for S-LOMS-SV as a whole, the relevancy and retention indices scores were 97% and 94%, respectively, as shown in Table 2.

Scale Validation With Preexisting Data Sets

The next step was to validate S-LOMS-SV with preexisting data. The validation tests reported in this paper comprise confirmatory factor analysis (CFA), test–retest validity analysis, posttest–pretest comparisons,

known-group analyses, and internal consistency analyses. We utilized the data sets collected in the previous studies (Lau & Snell, 2020a, 2021, 2022) and applied the procedures that had been performed for the 56-item S-LOMS to the smaller set comprising the 21 items of S-LOMS-SV. We considered that satisfactory results would provide preliminary confirmation of S-LOMS-SV's validity and reliability in terms of psychometric properties.

CFA and Internal Consistency Analyses

The data set from Lau and Snell's (2021) study of 655 students recruited from local Hong Kong universities (male: 31%, female: 69%; mean age: 20.7) was used to conduct a CFA using EQS 6.4 software. We also derived Cronbach's alpha values by using SPSS 29.0 to indicate scale internal consistency.

The students had completed the 56-item S-LOMS, but our preexisting data analysis focused on the 21 S-LOMS-SV items. The CFA was performed with a model that loaded these items onto their four overarching categories, which were set to intercorrelate with each other. Since the data showed violation of the multivariate normality assumption, a robust correction on its full information maximum likelihood (FIML) method was used. Accordingly, we reported the scaled chi-square (Satorra-Bentler, i.e., S-B $\chi 2$) and other adjusted indices in assessing the goodness of fit for the model (Bentler, 2006).

The CFA obtained satisfactory results. Overall, although the chi-square was significant (S-B χ^2 = 425.24, df = 183, p < .01), the goodness of fit indexes, including NNFI (.96), CFI (.96), and RMSEA (.05), are all above the benchmarks (NNFI & CFI >.95; RMSEA ≤ .05), indicating good model fit (Hu & Bentler, 1999). The scale's Cronbach's alpha value is .97, whereas the values for the four overarching categories range between .92 and .95. The intercorrelations (between .79 and .92) among the overarching categories and the standardized factor loadings (between .78 and .90) for the items were all statistically significant and above the cut-off criteria (see Table 3).

Table 3.

Confirmatory Factor Analysis Results

Scale/Overarching Category/Item	F1	F2	F3	F4	Cronbach's Alpha Value
S-LOMS-SV					.97
Interfactor Correlation					
F1: Knowledge Application	1				.92
F2: Personal & Professional Skills	.90	1			.95
F3: Civic Orientation & Engagement	.79	.86	1		.93
F4: Self-Awareness	.84	.92	.87	1	.92
Item Factor Loading					
Item 1	.88				
Item 2	.90				
Item 3	.89				
Item 4		.81			
Item 5		.85			
Item 6		.86			
Item 7		.83			
Item 8		.82			
Item 9		.85			
Item 10		.78			
Item 11		.85			
Item 12			.83		
Item 13			.82		
Item 14			.82		
Item 15			.87		
Item 16			.84		
Item 17			.83		
Item 18				.83	
Item 19				.87	
Item 20				.87	
Item 21				.85	

Note. Satorra-Bentler scaled chi-square = 425.24, *df* = 183, *p* < .01; NNFI = .96; CFI = .96; RMSEA = .05 (.04,.05).

In summary, the CFA results indicated satisfactory construct validity and scale internal consistency, with the 21-item S-LOMS-SV having a similar factor structure to that of the original S-LOMS. This factor structure confirmed that the four overarching categories of student developmental outcomes arising from service-learning dovetailed with past research findings, encompassing academic knowledge, academic skills/ dispositions, civic learning, and personal growth (e.g., Felten & Clayton, 2011).

Test–Retest Validity

For examining test–retest validity, a data set was used from the study by Lau and Snell (2020b) of 122 students, who had been recruited from local Hong Kong universities (male: 25%, female: 75%; mean age: 20.4) and who had completed the 56-item S-LOMS (including the 21 items of S-LOMS-SV) twice, two weeks apart, without service-learning intervention. Again, our preexisting data analysis focused exclusively on the S-LOMS-SV items.

Factor mean scores for the four overarching categories at the test (time zero) and retest phase (after two weeks) were obtained by averaging the corresponding item scores. The scale mean scores were also calculated by averaging all item scores. The mean scores for the same overarching category and the scale were then correlated to calculate the intraclass correlation coefficient and indicate the test–retest validity.

SPSS 29.0 was employed for this test. According to Koo and Li (2016), for benchmarking, the intraclass correlation coefficient (ICC) values between .50 and .75 were regarded as moderate, whereas between .75 and .90 as good.

Table 4 reports the test results regarding the ICC values and their mean scores for the four overarching categories and for S-LOMS-SV. Similar to the findings for the 56-item S-LOMS reported in Lau and Snell (2020b), the four overarching categories of S-LOMS-SV obtained moderate to good ICC values (.66 to .79), and there was a good value at the scale level (.76). The above results indicated that S-LOMS-SV, as with the original S-LOMS, is reasonably stable over time among its target population without service-learning intervention.

Table 4.

Test–Retest Reliability Test Results

Scale/Overarching Category	Intraclass Correlation Coefficient (ICC)	Lower Bound	Upper Bound	Test		Retest	
				M	*SD*	*M*	*SD*
The S-LOMS-SV	.76	.68	.83	7.1	1.1	7.3	1.0
Knowledge Application	.66	.55	.75	6.9	1.2	7.0	1.2
Personal & Professional Skills	.71	.61	.79	7.0	1.1	7.1	1.1
Civic Orientation & Engagement	.79	.72	.85	7.4	1.2	7.5	1.2
Self-Awareness	.71	.61	.79	7.1	1.3	7.2	1.2

Pretest–Posttest Comparisons and Known-Group Analyses

To confirm criterion validity, we performed two sets of tests: pretest–posttest comparisons and known-group analyses, focusing on the 21 SLOMS-SV items.

For the pretest–posttest comparisons, we used the pretest scores from the abovementioned sample of 655 students plus the data set of their posttest scores after service-learning experience (Lau & Snell, 2021). Since the effectiveness of service-learning has been well documented in past literature, we assumed that establishing differences between the pretest and posttest scores would provide support for the criterion validity of S-LOMS-SV.

Paired sample t-tests using SPSS 29.0 were performed at the levels of single items, overarching categories, and the overall scale. We included single-item-level analyses because some users of S-LOMS-SV may wish to report individual item results for quality assurance purposes. Results in Table 5 showed that all comparisons found that posttest scores were significantly higher than pretest scores, with small to moderate effect sizes revealed by the Cohen's *d* values. Those items representing relatively stable attributes, which take a relatively long time to change, such as empathy, caring for others, self-understanding, and commitment to self-improvement, tended to have smaller effect sizes than items representing knowledge application and relationship and team skills, which had moderate effect sizes.

Table 5.

Pretest–Posttest Comparison Results

Scale/Overarching Category/Item	Pretest		Posttest			Cohen's *d*
	M	*SD*	*M*	*SD*	*p* value	value
S-LOMS-SV	7.0	1.2	7.7	1.1	<.01	0.66
Knowledge Application	6.8	1.4	7.5	1.3	<.01	0.61
Personal & Professional Skills	6.9	1.3	7.6	1.2	<.01	0.64
Civic Orientation & Engagement	7.3	1.3	7.9	1.1	<.01	0.52
Self-Awareness	7.1	1.3	7.7	1.2	<.01	0.49
Item 1	6.8	1.5	7.5	1.5	<.01	0.52
Item 2	6.7	1.4	7.5	1.4	<.01	0.52
Item 3	6.8	1.5	7.5	1.4	<.01	0.52
Item 4	6.9	1.5	7.6	1.4	<.01	0.47
Item 5	6.9	1.4	7.6	1.4	<.01	0.49
Item 6	7.0	1.5	7.7	1.4	<.01	0.41
Item 7	6.9	1.6	7.7	1.4	<.01	0.52
Item 8	6.8	1.5	7.6	1.4	<.01	0.51
Item 9	6.8	1.5	7.6	1.4	<.01	0.49
Item 10	7.1	1.5	7.8	1.4	<.01	0.42
Item 11	6.9	1.4	7.7	1.4	<.01	0.49
Item 12	7.1	1.4	7.7	1.3	<.01	0.44
Item 13	7.0	1.4	7.7	1.3	<.01	0.47
Item 14	7.4	1.5	8.0	1.3	<.01	0.42
Item 15	7.5	1.5	8.0	1.3	<.01	0.36
Item 16	7.5	1.5	8.0	1.3	<.01	0.33
Item 17	7.3	1.5	7.9	1.4	<.01	0.38
Item 18	7.0	1.5	7.6	1.4	<.01	0.42
Item 19	7.1	1.5	7.8	1.3	<.01	0.44
Item 20	7.1	1.5	7.7	1.4	<.01	0.39
Item 21	7.2	1.5	7.7	1.4	<.01	0.34

For the known-group analyses, we compared three sets of scores and assumed that the criterion validity of S-LOMS-SV would be indicated if the scores obtained from respondents just after they had completed service-learning are higher than the scores from respondents with earlier service-learning experience, which in turn are higher than the scores of those without any service-learning experience.

One data set consisted of the posttest scores from the abovementioned 655 respondents who completed the 56-item S-LOMS after they had just finished their service-learning experience. The second data set came from a different group of 620 respondents (male: 36%, female: 64%; mean age: 20.8), who had service-learning experience some time prior to completing the 56-iterm S-LOMS, and the third data set came from another group of 292 respondents (male: 39%, female: 61%; mean age: 20.2) who had not any service-learning experience prior to completing the 56-item S-LOMS (Lau & Snell, 2022).

One-way analysis of variance (ANOVA) tests in SPSS 29.0 were used to compare the three groups at the levels of single items, overarching categories, and the overall scale. Table 6 reports the results for the mean scores of the three groups of respondents, showing that S-LOMS-SV indicated statistically significant differences between the three groups with small to moderate effect sizes, indicated by eta square. Again, comparisons indicated smaller effect sizes for the items representing relatively stable attributes, such as respecting diversity, empathy, and caring for others, whereas higher effect sizes were found for the overarching categories of knowledge application and personal and professional skills.

Table 6.

Known-Group Analysis Results

Scale/Overarching Category/Item	Without S-L Experience		Prior S-L Experience		Just After S-L			Eta
	M	*SD*	*M*	*SD*	*M*	*SD*	*p* value	square
S-LOMS-SV	6.8	1.1	7.2	1.0	7.7	1.1	<.01	0.10
Knowledge Application	6.4	1.3	7.0	1.2	7.5	1.3	<.01	0.09
Personal & Professional Skills	6.6	1.2	7.1	1.1	7.6	1.2	<.01	0.10
Civic Orientation & Engagement	7.2	1.2	7.4	1.1	7.9	1.1	<.01	0.05
Self-Awareness	6.7	1.4	7.2	1.2	7.7	1.2	<.01	0.08
Item 1	6.3	1.6	6.9	1.4	7.5	1.5	<.01	0.08
Item 2	6.4	1.4	6.9	1.3	7.5	1.4	<.01	0.08
Item 3	6.6	1.5	7.1	1.4	7.5	1.4	<.01	0.06
Item 4	6.6	1.6	7.0	1.4	7.6	1.4	<.01	0.07
Item 5	6.6	1.5	7.1	1.3	7.6	1.4	<.01	0.06
Item 6	6.7	1.4	7.1	1.3	7.7	1.4	<.01	0.06
Item 7	6.4	1.8	7.0	1.6	7.7	1.4	<.01	0.09
Item 8	6.3	1.7	6.9	1.5	7.6	1.4	<.01	0.09
Item 9	6.4	1.8	6.9	1.4	7.6	1.4	<.01	0.08
Item 10	7.1	1.7	7.2	1.5	7.8	1.4	<.01	0.04
Item 11	6.8	1.6	7.1	1.4	7.7	1.4	<.01	0.05
Item 12	6.7	1.6	7.1	1.4	7.7	1.3	<.01	0.07
Item 13	6.7	1.5	7.1	1.3	7.7	1.3	<.01	0.06
Item 14	7.6	1.7	7.6	1.4	8.0	1.3	<.01	0.02
Item 15	7.6	1.7	7.7	1.5	8.0	1.3	<.01	0.02
Item 16	7.5	1.7	7.6	1.4	8.0	1.3	<.01	0.02
Item 17	7.2	1.7	7.3	1.6	7.9	1.4	<.01	0.04
Item 18	6.4	2.0	7.0	1.7	7.6	1.4	<.01	0.07
Item 19	6.9	1.7	7.3	1.4	7.8	1.3	<.01	0.05
Item 20	6.9	1.6	7.3	1.4	7.7	1.4	<.01	0.05
Item 21	6.6	1.9	7.1	1.6	7.7	1.4	<.01	0.06

Note. S-L = service-learning.

Summary

The above validation tests using preexisting data sets revealed that the 21-item S-LOMS-SV achieved similar content validity, construct validity, test–retest validity, criterion validity, and scale internal consistency as the original 56-item version of S-LOMS. With respect to the attributes under measurement, S-LOMS-SV also indicated similar patterns to those found with the full-length S-LOMS. Thus, smaller effect sizes were obtained for relatively stable constructs, such as empathy, caring for others, respecting diversity, and commitment to self-improvement. Changes with larger effect sizes were indicated for relatively more readily trained attributes, such as knowledge application and personal and professional skills.

Discussion

Through a series of validation tests using preexisting data, our overall findings indicate that S-LOMS-SV is a valid and reliable instrument for measuring developmental outcomes and, like the full-length S-LOMS, is a potential resource for future service-learning research and pedagogical development. The 21-item S-

LOMS-SV demonstrated robust psychometric properties that are similar to those of the original 56-item S-LOMS. Furthermore, the validation results revealed several implications and contributions for the service-learning community, which we elaborate in this section.

First, in the content validity survey of the full-length S-LOMS, all 56 items achieved satisfactory to excellent relevancy index scores. This affirmative result formally filled a research gap, as there had been no prior study of the content validity of S-LOMS. Thus, the ratings of the expert committee members provided support for the conceptualization of student developmental outcomes arising from service-learning in the Hong Kong context as falling into 11 developmental domains under four overarching categories.

Second, the content validity survey and validation results reported in this article dovetailed with research findings in past literature about the positive impacts of service-learning on student development. The developmental gains indicated by both S-LOMS and S-LOMS-SV for the overarching categories of knowledge application, personal and professional skills, civic orientation and engagement, and self-awareness broadly cover academic performance, personal growth, and civic learning (Felten & Clayton, 2011). Our validation tests also showed that the factor structure is stable between S-LOMS and S-LOMS-SV and that this similarity persists across different samples, further providing empirical evidence about the developmental benefits arising from service-learning.

Third, as a result of this item reduction exercise, the four overarching categories of the S-LOMS-SV are theoretically more distinct from one another than in the longer S-LOMS, reflecting that some items from the latter, which potentially belong to more than one developmental domain, have been screened out from S-LOMS-SV. Nonetheless, we found that the four overarching categories within S-LOMS-SV are still highly intercorrelated, as indicated by the CFA results. Thus, the four overarching categories of developmental outcomes are associated with each other at the practical level, which implies that service-learning practitioners are advised to take account of holistic considerations when designing and implementing service-learning. For example, professional skill development, such as skills for teamwork and solving problems, can be more easily achieved through engagement in meaningful and challenging service in the community, which in most cases also results in civic learning. Satisfactory quality of service work experience is therefore an important factor contributing to student development and should be emphasized as an integral part of service-learning design and execution.

Fourth, from the school administrator's perspective, this study has successfully derived S-LOMS-SV with less than half the items of S-LOMS, providing a more convenient yet equally reliable tool for assessing student developmental outcomes arising from service-learning for quality assurance and continuous practice development purposes. S-LOMS-SV can potentially support an expansion of evidence-based evaluation of service-learning programs, resulting in further enhancements in service-learning provision in Hong Kong and further increasing the perceived legitimacy of service-learning among key stakeholders, such as educational institutions, teachers, donors, community partners, and students themselves. Furthermore, since S-LOMS-SV as a shorter measurement tool than S-LOMS is easier to administer and easier for students to complete, it is likely to achieve higher response rates, with less attrition between pretest and posttest phases (Nicolaoua & Atkinsona, 2019; Williamson & Wang, 2023). We thus anticipate that better quality evidence can be collected with greater efficiency.

We also note, however, that a limitation of S-LOMS-SV is that it lacks the adjustability of the full-length S-LOMS. The latter instrument allows service-learning researchers and practitioners to select which developmental domains they wish to measure, according to their interests. By comparison, S-LOMS-SV can only allow flexibility at the overarching category level, because it is impossible to validate developmental domains from two items or fewer. This reduction in flexibility is a trade-off resulting from the reduced scale length. This may not be a problem if users can recognize a division of labor between S-LOMS and S-LOMS-SV in serving different purposes. The full-length S-LOMS is suitable when users are interested in measuring outcomes for particular developmental domains, whereas S-LOMS-SV may be preferred if users are primarily interested in the overarching categories. For quality assurance purposes, S-LOMS-SV can be employed conveniently without compromising psychometric properties.

Another limitation of both S-LOMS-SV and S-LOMS is their relatively depoliticized and status quo orientation toward civic engagement, reflecting that they were designed to capture the intended developmental outcomes that are based on Confucian-influenced educational philosophy, as preferred in Hong Kong, which we discussed earlier in this paper.

Conclusions and Next Steps

The development of service-learning in Hong Kong has been hindered by the lack of reliable and valid measurement tools to demonstrate its pedagogical effectiveness. The full-length S-LOMS was developed to fill this gap. The current study took a step further to streamline this measurement tool into a short version, the S-LOMS-SV, which constitutes an important tool for school senior management, donors, and other stakeholders to collect service-learning outcome evidence for quality assurance purposes. The content validity survey enabled us to screen items to arrive at a much shorter scale (S-LOMS-SV) while also endorsing the content validity of the longer S-LOMS as a new and incidental finding. Our further validation studies using preexisting data provided preliminary confirmation that S-LOMS-SV retains most of the psychometric properties shown in the original, full-length version.

Our proposed next steps for S-LOMS-SV validation are threefold. First, a further validation of S-LOMS-SV should be conducted with new and independent samples as recommended by previous researchers (e.g., Coste et al., 2013; Smith et al., 2000). One limitation of the current validation exercise is that the preexisting data used here are limited to students in Hong Kong universities. Further studies should expand the scope to validate S-LOMS-SV in other Asian jurisdictions similar to Hong Kong, where education and service-learning are greatly influenced by Confucianism, such as Singapore, Korea, and Japan, and with other educational levels (Lau & Snell, 2021), so as to extend the potential applicability of S-LOMS-SV in different situations.

Second, if and when S-LOMS-SV is validated in other locations, a centralized database comprising student developmental outcome evidence measured by S-LOMS-SV from different institutions and jurisdictions can be established. Benchmarks and norms could be derived from such a database in order to provide useful information and insights for service-learning researchers and school senior management to perform cross-cultural, cross-institutional, and cross-program comparisons. Such comparisons could facilitate collaboration and exchange of ideas, resulting in further pedagogical development.

Third, the deployment of S-LOMS-SV in conjunction with other reliable tools for collecting stakeholder feedback can help understand the problematization, or the "dark side" of service-learning, called out by some researchers, and prevent it from happening. Over the years, there have been several warnings about the dark side of service-learning. These include causing harm to the community due to inadequate training and preparation for students before service, prioritizing student development over community benefits, and adopting and conveying the false assumption that volunteerism is an adequate substitute for professionally administered social policy and action (e.g., Eby, 1998; Jones, 2002; Stoecker, 2016; Whitfield, 2005). To steer service-learning away from these "reefs," authentic partnerships between schools and community organizations are necessary, and good practices must be ensured. Collecting reliable feedback from various stakeholders, including students, instructors, community partners, school management, and service beneficiaries, is therefore essential, drawing on a battery of assessment and feedback tools.

We consider that using S-LOMS-SV as a means for monitoring student developmental outcomes will only be effective if data from those other stakeholders are also collected, with findings triangulated holistically for meaningful interpretation and analysis. For example, data from S-LOMS-SV can be compared with data about student service-learning experience to identify key drivers for desirable student developmental outcomes while also being compared with data from community impact feedback instruments to guide and establish authentic collaboration with community partners. We envisage that long-term collaborative efforts by the entire service-learning stakeholder community are required to accomplish this vision. A standardized and reliable tool, such as S-LOMS-SV, is just one piece in the puzzle, albeit a very important one.

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Appendix

The Finalized S-LOMS-SV

Please choose the appropriate scores (1 = *strongly disagree*; 10 = *strongly agree*) to indicate the extent to which you agree with each of the following statements.

Overarching Category/Item	Strongly Disagree 1	2	3	4	5	6	7	8	9	Strongly Agree 10
Knowledge Application										
1. I know how to apply what I learn in class to solve real-life problems.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
2. I am able to apply/integrate classroom knowledge to deal with complex issues.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
3. I know how to transfer knowledge and skills from one setting to another.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Personal & Professional Skills										
4. I am able to generate original ideas.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
5. I feel confident in identifying the core of a problem.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
6. I often modify my strategies to solve a problem when the situation changes.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
7. I am good at building relationships between people.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
8. I am good at resolving conflicts.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
9. I am confident in leading others toward common goals.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
10. I reflect on myself regularly.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11. I often look at complex issues from different angles.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Civic Orientation & Engagement										
12. I will contribute my abilities to make the community a better place.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
13. I can identify issues that are important for a disadvantaged community.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
14. I respect the needs of people from different backgrounds.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
15. I care about others.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
16. I observe others' feelings and emotions.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
17. I believe that taking care of people who are in need is everyone's responsibility.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Self-Awareness										
18. I am positive about myself.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
19. I know my strengths and weaknesses.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
20. I have a clear understanding of my own values and principles.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
21. I am always motivated to learn.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

About the Authors

Ka Hing Lau was formerly an assistant manager of the Centre for Innovative Service-Learning and General Education Office at Hong Kong Baptist University, specializing in scale development, curriculum and program assessment and evaluation, and service-learning research. https://orcid.org/0000-0002-7255-186X

Lisa Lam, PhD, SFHEA, is the director of the Centre for Innovative Service-Learning at Hong Kong Baptist University. She leads the development of academic service-learning initiatives and the University's first coworking space, TriAngle, which engages students in cocurricular social innovation projects.

Robin Stanley Snell is an adjunct professor of management at the Hang Seng University of Hong Kong. He has published on organizational ethics, organizational learning, social responsibility, service-learning, service leadership, and shared value creation.

Carol Hok-Ka Ma is associate professor and head of Gerontology Programmes, S R Nathan School of Human Development & Senior Fellow (Service-Learning and Community Engagement), Centre for Experiential Learning, at Singapore University of Social Sciences. She is an active and passionate promoter of service-learning and aging in Asia.

Correspondence concerning this article should be addressed to Lisa Lam of the Centre for Innovative Service-Learning, Hong Kong Baptist University, Hong Kong, China. Email: lisalam@hkbu.edu.hk