

Learner Awareness Levels Questionnaire: Development and Preliminary Validation of the English and Malay Versions to Measure How and Why Students Learn

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Abstract—The purpose of this study is to evaluate the English version and a Malay translation of the 21-item Learner Awareness Questionnaire for its application to assess student learning in higher education. The Learner Awareness Questionnaire, originally written in English, is a quantitative measure of how and why students learn. The questionnaire gives an indication of the process and motives to learn using four scales: survival, establishing stability, approval and loving to learn. Data in the present study came from 680 university students enrolled in various programmes in Malaysia. The Malay version of the questionnaire supported a similar four factor structure and internal consistency to the English version. The four factors of the Malay version also showed moderate to strong correlations with those of the English versions. The results suggest that the Malay version of the questionnaire is similar to the English version. However, further refinement to the questions is needed to strengthen the correlations between the two questionnaires.

Keywords—Student learning, learner awareness, instrument validation.

I. INTRODUCTION

QUESTIONNAIRES have been developed to aid student learning and enhance their learning experiences. Some of these questionnaires, including the Strategy Inventory for Language Learning [1] and the Motivated Strategies for Learning Questionnaire [2], have focused on the overall learning motivation levels in students to the development of learning strategies. The information gathered from these questionnaires provides useful information for all academics to ensure meaningful learning takes place in their classrooms. Further to this students will also be able to gain insights into the strategies they have when they are learning. However, these questionnaires do not address how and why students

In Malaysia, there is a growing interest in gaining some form of learning effectiveness that is comprehensive and encourages life-long learning [3]. In the recent Malaysia Education Blueprint 2013-2025 [3] it is stated that one of the research focus would be on the quality learning processes undertaken by students. One effective method to address this

is to develop appropriate quantitative measures to address the issue of quality learning [4]. However, Lonka, Olkinuora, and Makinen [5] cautioned that developing psychometric instruments that effectively measured student learning is a long and rigorous process. Existing instruments that have been developed can be used but need to be validated for the context. Immekus and Imbrie [4] also highlighted that factor analysis results from such instruments may not represent the proposed model when scores are obtained from students with diverse cultural backgrounds, suggesting that the psychometric properties may also be sensitive to cultural variations. Hence, psychometric instruments that have been developed for western populations may not be appropriate for use with multi-cultural populations as those found in Malaysia.

While there are many ways of evaluating student learning from the strategies they use to their motivations, it is also possible to generate data from their perceptions of why and how they learn. Students know the reasons they want to learn and the approaches they take to make learning happen. This constitutes their learning awareness, which requires the conscious and willing participation of the learner during the process [6]. Currently, to the authors' knowledge there is no validated psychometric instrument that is designed specifically to measure this aspect of learning, especially not one that is translated into *Malay* for use in Malaysia. This article reports on the development of the English and *Malay* versions of the Learner Awareness Questionnaire (LALQ) and its validation process for use with Malaysian students of higher education.

II. LEARNER AWARENESS

Learning occurs when students use combinations of three aspects: affective, behaviour or psychomotor and cognitive [7], [8]. Hence when the three aspects of learning are viewed from a constructivist stand point, it implies that learners are allowed to construct their own meaning of what they learn in the form of stimuli from their environment [9]. According to [10], it is commonly observed and scientifically acknowledged that great differences exist, between people and their capacity to modify themselves in terms of their thinking, knowledge base and ability to function following their exposure to stimuli. Hence learning is dependent on individuals and how they respond to repeated stimuli. In brief, learning is a process which determines how information is taken in and processed, resulting in some form of continued growth and change. The use of these three aspects creates learning that is multi-levelled, progressing from surface learning to deep learning

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[11]. As students learn they interact with the world around them which leads to changes of their perceptions expanding their awareness through the process [12]. Often students are able to show what they have acquired but are unable to verbalise what they have learned [13]. Hence there must be a certain awareness of what they have learned. Aczel [6] further notes that there is no evidence of unconscious learning taking place and all learning required the awareness and conscious participation of the learners during the process. Therefore, learning can only occur with the full participation of the learners. Marton and Booth [14] stress that many studies on learning had been ineffective as they perceived students as not being in control of their own learning, resulting in findings that are not useful for the students or teachers.

Entwistle and Peterson [15] suggest that in order for students to develop an awareness of the nature of learning they must have a fully developed conception of learning. This requires them to have an awareness of different contexts to which learning can be used and be able to adapt it to various tasks. Students will also interpret what is required of them in a particular learning situation based on past events [16]. Therefore students will bring with them a set of aims and attitudes that expresses their relationship with a learning situation. The way information is processed will determine the progress from surface to deep learning [11]. These studies and the constructivist view provided the theoretical framework of the development of the LALQ.

III. DEVELOPMENT OF THE LEARNER AWARENESS QUESTIONNAIRE

The LALQ was developed using the results from a phenomenological study by [17] and related studies on student learning [11], [18] which found that students' learning fall into four levels of awareness: survival, establishing stability, approval and loving to learn. These four levels of learning awareness will give an indication of how information is taken in and why the information is perceived important. The phenomenological study is qualitative hence the results are presented as a description of the experiences and manner in which the participants perceive a concept [19]. The results of this study showed that it was feasible to collect data on how and why student learn as a measure of their learning awareness. The study [17] showed that all students had awareness of how and why they learned, regardless of their achievement levels.

The preliminary English version of the LALQ had 36 items which focused on the four levels of awareness: survival, approval, establishing stability and loving to learn. This questionnaire was then given to five persons that were academic staff of a university but not taking part in the research. This group of people was requested to comment on the questionnaire for any linguistic ambiguities and items that had inadequacies were modified.

IV. VALIDATING THE ORIGINAL ENGLISH VERSION OF THE QUESTIONNAIRE- EXPLORATORY AND CONFIRMATORY FACTOR ANALYSIS

A. First Exploratory Factor Analysis

The 36-item LALQ was then administered to 172 undergraduate students (89 female and 83 male) enrolled in Diploma programmes. They were all full time students from a number of faculties. The questionnaire was done as a paper and pencil exercise with the consent of each participant. A 5-point Likert scale was used for each item, with a 5 indicating strongly agree, 4 Agree, 3 Neutral, 2 Disagree and 1 Strongly disagree. It was decided to have the neutral response choice in the questionnaire because the inclusion of this option allowed it to have better psychometric coherence when the items were considered as a whole and it would have little effect on the overall reliability and validity [20]. In addition, the study was also focused on assessing the convictions of students, in terms of their firm opinions about how and why they learn. The neutral response represented a conviction and was different from a "no opinion" and a "don't know" response [21]. The data was then encoded and then entered into SPSS (Version 16) for initial analysis.

Prior to conducting the Exploratory Factor Analysis (EFA), two indicators were tested for sample appropriateness for such an analysis. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy index was 0.74, and Bartlett's Test of Sphericity was significant $\chi^2 = 1877.14$, $p < 0.0001$, indicating that the sample and correlation matrix were within an acceptable range for the analysis.

The EFA was then used to assess fit, detect possible factor structure and eliminate non-fitting items. Questionnaire soundness was examined using principal components factor analysis with varimax rotation. The scree plot test and the acceptance of eigenvalues greater than one, together with a comparison of a parallel analysis of an equivalent set of eigenvalues obtained from a random data set of the same size, were used to identify the number of factors likely to be extracted. Only eigenvalues that exceeded the corresponding values from the random data set were retained. A factor loading of 0.40 was used as the cut off point for variable acceptance in the initial analysis. There were twelve factors with eigenvalues greater than one, accounting for 65.9 per cent of the variance in the respondents' scores. Rotation converged after 23 iterations. The first four factors accounted for 37.5 per cent of variance in the respondents. These eigenvalues when compared using the parallel analysis of an equivalent random data set, were higher. Based on the results of the analysis, it was decided that a criterion loading of higher than 0.45 would be used to select items for further analysis. This yielded items with loadings ranging from 0.45 to 0.79.

Reliabilities (α) for each of the factors were 0.78 for 'Survival', 0.75 for 'Establishing Stability', 0.60 for 'Approval' and 0.77 for 'Loving to Learn'. The Cronbach alpha for the 'Approval' scale was only 0.60 but its mean inter item correlation of 0.27 falls within the optimal range of 0.2 to 0.4 [21], [22]. The four-factor solution seemed both

parsimonious and provided a better interpretation of students' awareness of how and why they learn. The four factors were subsequently named Survival, Establishing Stability, Approval and Loving to Learn. It was decided that a second EFA was needed because only 21 items of the original 36 items had factor loadings greater than 0.40. These items were selected for further testing.

B. Second Exploratory Analysis

Another group of 331 students (178 female and 153 male) participated in the study. These students from various faculties were all enrolled in full time Diploma programmes. The age ranges of the sample were as follows: 311 between 16-20, 17 between 21-23 and three between 24-26. The questionnaire was done as a paper and pencil exercise with full consent of each participant. The data was then coded and entered into SPSS (Version 16) for analysis.

The KMO measure of sampling adequacy (0.80) and the Bartlett's test of Sphericity ($\chi^2 = 2009.22, p < 0.0001$) met the required standards for EFA. The principal-axis factoring of the EFA with varimax rotation of the 21 items yielded four factors with loading ranging from 0.42 to 0.86. Eigenvalues greater than one accounted for 51.5 per cent of the variances in the students' scores. The screen test, however, suggested that only three or four factors could be extracted, therefore these possibilities were explored. Only items with factor loading above 0.40 were used. This resulted in a four factor solution with the following label given to each of the factors: survival,

establishing stability, approval and loving to learn.

C. Confirmatory Factor Analysis

When the factor structure of the 21-item LALQ (Table I) was examined using a confirmatory factor analyses from 356 students (180 female and 176 male) from various faculties enrolled in Diploma programmes, the results supported a four factor baseline structure (RMSEA = 0.056, GFI = 0.923, CFI = 0.910) and the four factor hierarchical structure (RMSEA = 0.043, GFI = 0.937 and CFI = 0.943). However, the hierarchical model had better overall fit indices (Table II). Although the four factor hierarchical model had good fit indices for the English version, it does not apply to the Malay version. Hence, it needed to undergo validation as well.

V. VALIDATING THE MALAY VERSION OF THE LALQ

In order to ensure that vigorous procedures were used in the validation of the Malay version of the LALQ (LALQ-M), the linguistic and psychometric equivalence of the instrument needed to be established. Hence, the researchers took measures to establish that the LALQ-M was similarly understood in both English and Malay (linguistic equivalence). The psychometric characteristics of the translated measure were also compared to the original version to ensure that the instrument functioned similarly in different social groups (psychometric equivalence).

TABLE I
FACTOR ANALYSIS WITH VARIMAX ROTATION FOR THE ENGLISH AND MALAY VERSIONS OF THE LEARNER AWARENESS LEVELS QUESTIONNAIRE

Scales	Typical Items	Items	Survival		Establishing Stability		Approval		Loving to Learn	
			E	M	E	M	E	M	E	M
Survival	My family wants me to study so I think I have no choice but to listen to them	Q1	.750	.791						
	To please my parents, I enrolled in this programme although I do not like it	Q2	.731	.836						
	I study because my parents want me to	Q3	.741	.782						
	I am studying in this institution because I want to please my parents	Q4	.670	.805						
	I have always thought that I had no choice about going to school	Q5	.583	.716						
	I do my course work because I do not want to disappoint my parents	Q6	.507	.603						
	I signed up for this programme because my friends signed up for it	Q7	.454	.417						
	I give up easily especially when I feel the subjects are difficult	Q8	.446	.460						
	I learn because I want a better future	Q9	.410	.085		.736*				
Establishing Stability	I am studying now so that I can have a good job in the future	Q10			.794	.742				
	Passing examinations is important to me for a secure future	Q11			.778	.787				
	I make sure I go for my classes because what I learn can be applied to my future	Q12			.652	.472				
	I will just memorise my notes rather than analyse them in order to pass my examinations.	Q13			.616	.075				.495*
Approval	I think my friends will be impressed if I do well in my studies	Q14					.692	.682		
	I am confident I can do the work required in this programme and graduate on time	Q15			.490*	.659	.039			
	I feel confident I can pass my examinations with good grades	Q16			.603*	.609	.056			
	I think I will have more friends if I do well in my studies	Q17				.596	.730			
Loving to Learn	I think learning is fun	Q18							.802	.744
	I find learning interesting	Q19							.795	.842
	I love learning all through my school year until now	Q20							.772	.767
	I like to think of new ways to learn something	Q21							.608	.700
Percentage Variance (after rotation)			14.84	22.49	26.42	38.82	37.72	47.60	46.30	53.96

Key: E: English; M: Malay, *Stronger factor loadings for Malay

Linguistic equivalence was established using the translate retranslation [23], [24] of the instrument as recommended by the International Test Commission [25] and interlanguage reliabilities was established using Cronbach Alpha and Pearson Product-Moment Correlation on the two versions of the questionnaire. The LALQ-M was translated from the LALQ through a university lecturer teaching the Malay language and then back translated by another lecturer teaching the Malay language. Minor corrections were made to the LALQ-M by the researchers after the first translation. The original English version and the translated back version were very similar. The translation processes were considered sufficient for the purposes of this study which was exploratory in nature. It is, however, acknowledged that further refinement of the LALQ-M to further adhere to the International Test Commission guidelines would be beneficial.

TABLE II

SUMMARY OF THE INDICES OF FIT FOR THE HYPOTHESED MODELS								
Model	N	χ^2	DF	χ^2/DF	P-VALUE	RMSEA	GFI	CFI
Four factor baseline model	356	303	150	2.02	0.00	0.056	0.923	0.910
Four factor hierarchical model	356	244	150	1.62	0.00	0.043	0.937	0.943

A. Participants

A total of 177 full time students were used in this study consisting of 50 females and 127 males from various Diploma programmes at the university. The age ranges of the sample were as follows: 154 between 18-20, 18 between 21-23, 3 between 24-26 and 2 of them did not indicate their age ranges. The consent of all participants was obtained and the questionnaire was done as a paper and pencil exercise. The data was then coded into SPSS (Version 16) for analysis.

B. Analysis

The LALQ-M was analysed through an exploratory factor analysis and found to have four factors that were similar to the LALQ. The KMO measure of sampling adequacy (0.799) and the Bartlett's test of Sphericity ($\chi^2 = 2025.78, p < 0.0001$) met the required standards for exploratory factor analysis. A combination of the scree plot test and the acceptance of eigen value greater than one were used to identify the number of factors.

The Pearson Product-moment correlations were also obtained for the four factors in the LAL and the LAL-M, in order to explore the relationships between the two groups. Item-scale convergent validity was tested through inter-item correlation. The convergent validity fell within an optimal range of 0.2 to 0.4 for all four factors.

The internal consistency of the four levels of the LALQ-M was determined using the Cronbach alpha for reliability and compared to those obtained for the LALQ.

C. Results

All the factor loadings of the LALQ and LALQ-M were similar except for questions 9, 13, 15 and 16. The low factor loadings could be due to an inaccurate translation of the items.

Table I shows a comparison of the LAL and LALQ factor loadings with varimax rotation.

The Pearson correlations of the LALQ and LALQ-M for each of the four levels were significant at the $p < 0.001$ level (Table III). The correlations between 'Survival' for the LALQ and LALQ-M was $r(177) = 0.38, p < 0.001$; 'Establishing Stability' was $r(177) = 0.77, p < 0.001$; 'Approval' was $r(177) = 0.30, p < 0.001$; and 'Loving to Learn' was $r(177) = 0.46, p < 0.001$. The four awareness levels of the two versions of the questionnaire showed medium to large correlations with each other [25].

The internal consistency of the levels of the LALQ-M was similar to the four levels of the LALQ. Reliabilities (α) for each of the factors were 0.80 for 'Survival', 0.70 for 'Establishing Stability', 0.63 for 'Approval' and 0.79 for 'Loving to Learn'. The Cronbach alpha for the 'Approval' scale was only 0.60 but its mean inter item correlation of 0.30 fell within the optimal range of 0.2 to 0.4 [26].

TABLE III

PEARSON PRODUCT-MOMENT CORRELATIONS BETWEEN THE LEVELS LALQ AND LALQ-M

	LALQ-M			
	Survival	Establishing Stability	Approval	Loving to Learn
LALQ				
Survival	0.38**	-0.13	0.09	-0.07
Establishing Stability	-0.12	0.77**	0.21**	0.21**
Approval	-0.09	0.42**	0.30**	0.15
Loving to Learn	-0.07	0.36**	0.028	0.46**

$n = 177, **p < .001$.

VI. DISCUSSION AND CONCLUSION

This article presented the development and validation of the English and Malay versions of the LALQ. The development process of the LALQ, which was originally written in English, commenced with testing 36 items that were in the initial version of the test. The process of drawing up this pool of items was guided by the insights into how and why students learn from [17] that used a constructivist framework and approaches to student learning established by other researchers in the field.

A process of testing and refinement resulted in a final version with 21 items divided into four levels: Survival, Establishing Stability, Approval and Loving to Learn. The Survival level consisted of nine items and the rest of the levels consisted of four items each, so the questionnaire is short enough for use by educators. At the same time, the rigorous testing described in this article shows that the final version of the questionnaire has good psychometric properties.

The validation process has shown that the LALQ will give an indication of why students will learn something and how they will go about carrying out the learning process. The Survival level of the LALQ indicates an approach to learning while the other three levels also gives an indication of both the learning approach used (how they learn) as well as the process to achieve a learning goal hence why they learn.

The results of the EFA of the LALQ-M showed that it had a similar four-factor structure as the LALQ. The factor loading for each of the items of the LALQ-M were also similar to the LALQ except for Items 9, 13, 15 and 16. These items need further refinement in terms of the sentence structure and wordings used. Item 9 could have been interpreted as 'I want to learn for a better future' which is less centred on the self. The translation for Item 13 could have been misinterpreted because it did not specifically refer to examinations as in the original version. Students could have interpreted Item 15 as 'completing work required' rather than 'graduating on time'. Rather than 'being confident about passing exams', Item 16 could have been interpreted as 'having more confidence as a result of passing exams'

The correlations between the four levels in the two versions of the questionnaire are medium to strong, suggesting that the LALQ-M will assess similar aspects of student learning as the LALQ. Both the LALQ and LALQ-M also had similar internal consistencies with relatively strong Cronbach's alpha values.

From these preliminary validation studies of the two versions of the LALQ, it appears that both of them measure how and why students learn and can discriminate between the four different learner awareness levels. It can be used to help students develop better learning strategies and gain better insights of how they learn. However, it must be noted that the questionnaire does not represent the complete picture of how and why students learn. Goh et al. [27] caution that data obtained from a questionnaire is very context-bound and results may be influenced by other factors like students domicile, gender and their grade point average in the programme.

Further studies need to be conducted using a wider group of higher education students in terms of ethnicity and domicile which can supplement the data obtained. The influence of achievement levels in terms of grade point averages can be included to generate a better picture of student learning.

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