

Psychometric Evaluation of the Study Habits Questionnaire for University Students

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ABSTRACT

Students' study habit has strong relationship with academic achievement. Present study was aimed to evaluate the psychometric properties of the Study Habit Questionnaire for university students of Bangladesh in response to scarcity of such psychometric tools on target population. The Bangla version of the questionnaire was administered on a multistage sample of 150 students of the University of Chittagong in Bangladesh following the guidelines of the International Test Commission (ITC). Psychometric properties of the measure were estimated by item analysis, exploratory factor analysis (EFA), internal consistency reliabilities, and the Pearson product-moment correlation coefficient. The item-total correlations, factor loadings in EFA, Cronbach's Alpha, split half reliability through the Spearman-Brown formula and the significant relationship between study habits and academic achievement suggested that the Bangla version of the Study Habits Questionnaire was a psychometrically sound measure and suitable for Bangladeshi university students.

Keywords: *Study Habit, Reliability, Validity.*

Learning is a highly complex process which is the end point of study. Learning involves the use of proper study habits and skills which are not innate abilities like intelligence, but these are formulated, acquired, and fixed by repeated efforts. Study habits can be defined as habitual manners and ways of exercising and practicing through which students' plan their academic studying outside the lecture hours for mastering a subject or topic of syllabus. It consists of study attitude, study skills and methods. Study habits facilitate students' learning tendencies to which students engage in regular act of studying. Good (1973 as cited in Okunlola, Omonijo, Mabia, & Anyaegbunam, 2016) defined study habits as the way students' study which could be an organized, proficient or unproductive way. Every student has own study habits that might be either proper or good study habits or improper or bad study habits in terms of obtaining good grades. It is not just memorizing facts or topics of the syllabus; the effective study habit is more than that. It is effective study skills that involves to know where and how to obtain important information and use that information. Factors like

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Psychometric Evaluation of the Study Habits Questionnaire for University Students

concentration, motivation, adjustment in educational institution, networking etc. influence the development of the study habits. Ideal study habits include having personal time table, trying to study same times each day, setting specific goals for studying, studying course materials on regular basis, reading class topics before the class for better understanding teachers' lecture, working on study tasks i.e. assignment, homework etc., completing assignment, homework on time, reviewing notes that has taken in the classes, choosing a definite place which is free from noise and other factors those are accountable for distraction in studying, reading other materials on a topic to get more information, asking for helping on difficult topic to understand well. It is one of the most important topic in the educational research (Sherafat & Murthy, 2016). Azikiwe (1998, as cited in Okunlola et al., 2016) opined that students' effective study habits might be regarded as important assets to them. Effective study habits stir up students to achieve mastery of their academic program. Studies suggested significant positive relation between study habits and academic achievement (Ch, 2006; Crede & Kuncel, 2008; Oluwatimilehin & Owoyele, 2012; Kumari & Chamundeswari, 2015; Siah & Maiyo, 2015; Sherafat & Murthy, 2016; Thomas, Omotoke, & Ademola, 2016; Chilca, 2017). Poor time management approach to studying and increase usage of the surface learning strategies associated with poor academic performance (Bickerdike, O'Deasmhunaigh, O'Flynn, & O'Tuathaigh, 2016). Study habits can be assessed through inventories, reports, examinations, rating scales etc. There are no well-developed or validated study habits questionnaire for Bangladeshi university students to identify and measure the efficiency of study habits that students have. There is a developed study habits scale, but it was developed for secondary school students in Bangladesh (Karim & Banu, 2000). So, we intended to evaluate the psychometric properties of an instrument for measuring study habits of the Bangladeshi university students. There are some available scales for measuring study habits. Among these, the study habits questionnaire (Tomas et al., 2016) was chosen to assess the psychometric properties in the Bangladeshi culture. As it is a relatively short measure than other study habits measures, it would be able to reduce the fatigue effect of measure which would be helpful to get the more accurate picture of students' study habits.

Main objective of the present study was to estimate the psychometric properties of the Study Habits Questionnaire in Bangladeshi culture for university students. The specific objectives were: (i) to identify the factor structure of the Bangla Study Habit Questionnaire; (ii) to determine the reliability of the Bangla Study Habit Questionnaire; (iii) to estimate the predictive validity of the Bangla Study Habit Questionnaire.

METHODOLOGY

Participant

The target population of the present study was the university students of Bangladesh. From this population, 150 Chittagong University students from faculty of arts, social science, and business studies were selected as a sample through the convenience sampling technique. Their age *mean* was 23.05 years with *standard deviation* 2.73 years and monthly family income *mean* was BDT 42119.22 with *standard deviation* BDT50558.23. Respondents' distribution in gender, year, residence type, family type by their corresponding faculty is presented in Table 1.

Psychometric Evaluation of the Study Habits Questionnaire for University Students

Table 1 Respondents' distribution in gender, year, residence type, family type by their corresponding faculty

Faculty	Gender		Year				Residence		Family Type	
	Male	Female	2nd	3rd	4th	Masters	Resident	Non-resident	Single	Joint
Arts	26	29	0	19	32	4	9	46	46	9
BBA	25	24	29	0	0	20	14	35	38	11
SS	27	19	0	0	0	46	13	33	38	8
Total	78	72	29	19	32	70	36	114	122	28

Measures

The *Study Habit Questionnaire* was developed by Thomas et al. (2016). It was consisted of 12 items with a four-point Likert-type scale of Strongly Agree (4), Agree (3), Disagree (2), and Strongly Disagree (1). All items were positively worded. Total score provides information about a unidimensional construct. The obtainable score ranges from 12-48. Higher score represents more efficient study habits. The measure has content validity as reported by authors. The *Cronbach's Alpha* of SHQ in original study was 0.81. Students' last year results were taken as their academic results.

Adaptation Procedure

The original version of the *Study Habits Questionnaire (SHQ)* was translated into Bangla language for Bangladeshi university students. The procedure for the translation of the *SHQ* was carefully done with taking into account the rules and guidelines established by the International Test Commission (ITC) for the translation and adaptation of measurement instruments from one language to another language and from one culture to another culture.

Step One: Ensuring construct equivalence

Available literature on study habits published in different scientific journals and books by educational psychologists, education researchers had been reviewed to determine whether the original version of the *SHQ* had the same meaning in Bangladeshi culture as in foreign culture. Experts' opinions were sought to determine the equivalence of construct between two cultures. It appeared convincing from experts' opinions along with literature review that the construct under this study had same meaning and the same definitions equally applicable to Bangladeshi culture.

Step Two: Forward translation

The *SHQ* was translated into Bangla with the help of one language expert and one subject expert without consulting each other. They put much effort in selecting the best words, expressions, or items to while translating. Then their translations of the *SHQ* were synthesized into one. Then, that synthesized translation was examined for by 2 experts who were not same persons of previous 2 experts who translated the measure. They were requested to check and systematic revision of conceptual equivalence of words or phrases, but not a word for word translation. They suggested some modifications of some words, expressions. According to their suggestions again translated version of the *SHQ* was synthesized again.

Step Three: Back Translation

The translated final draft of the *SHQ* was back translated by 2 experts –one subject expert and one language expert. Then their translations were synthesized into one and compared by other two experts. They were requested to compare the content of the original version of the *SHQ*

Psychometric Evaluation of the Study Habits Questionnaire for University Students

and back translated version and asked to recommend any correction and advice if they have. They had no major recommendations. All of them rated that items of the two versions had same content.

Step Four: Pilot Study

Administration

In this stage, the measure was administered on a sample of 40 students from the Sociology Department of the Chittagong University who were selected on the basis of convenience. The measure was administered in classroom settings. At first, they were asked to read the instructions on the top of the questionnaire very carefully. Also, we explained what was to be done. They were also informed about the objectives and significance of the study. They were asked to fill-in the demographic information sheet and read the questionnaire and express their answers for each item by putting 'tick' marks (✓) on the appropriate response boxes that best express their opinion. During the administration of the questionnaire, respondents were allowed to ask questions about the words or concepts that they did not understand. The words or expressions that they asked were noted by the test administrators to verify whether it was necessary to modify them.

Analysis

The pilot study data were analyzed to estimate the *Cronbach's Alpha* and *corrected item total correlation* which indicated the appropriateness of each item. *Item Analysis* revealed the Bangla version of the *SHQ* contained satisfactory level of reliability.

Step Five: Field Study

As being confirmed from the pilot study that the translated Bangla version of the *SHQ* was suitable for Bangladeshi university level students, a field study was carried out to estimate the psychometric properties of the Bangla *SHQ*. At the beginning of the administration of the Bangla *SHQ* to the respondents, they were requested to read the written instructions carefully. They were also given verbal instructions about what they would do. They were informed about the objectives and significance of the study. They were told that there was no right or wrong answer but it was important to answer honestly. They were also assured that the information collected from them would be kept strictly confidential and would be used only research purposes. They were asked to fill-in the demographic information sheet and read the questionnaire and express their opinion for each item by putting 'tick' marks (✓) on the appropriate response boxes that best express their opinion. After completing their tasks, they were thanked for their cordial cooperation.

RESULTS

Item Analysis

The collected data were subjected to the *item analysis* to estimate internal consistency of the *SHQ* and *corrected item-total correlations* for each item to the scale. *Corrected item-total correlations* were presented in Table 2.

Table 2 Corrected item-total correlation and Cronbach's Alpha if the item deleted

Item	Corrected item-total correlation	Cronbach's Alpha if item deleted
Item 1	0.489	0.768
Item 2	0.527	0.766
Item 3	0.488	0.770
Item 4	0.561	0.763

Psychometric Evaluation of the Study Habits Questionnaire for University Students

Item	Corrected item-total correlation	Cronbach's Alpha if item deleted
Item 5	0.440	0.774
Item 6	0.538	0.763
Item 7	0.464	0.771
Item 8	0.499	0.768
Item 9	0.530	0.764
Item 10	-0.114	0.828
Item 11	0.474	0.770
Item 12	0.418	0.775

Results from Table 2 shows that *item-total correlation* ranged from -0.114 to 0.564. Item 10 had negative *item-total correlation* only (-0.114). This item was dropped from the Bangla *SHQ* in further analyses.

Determining Validity

The validity of the Bangla *SHQ* was measured by following methods -

Content Validity: Content validity is the systematic examination of the test content to determine whether it covers a representative sample of behavior domain to be measured. The essential remarks of the expert panels assured the content validity of the Bangla *SHQ*.

Construct Validity: Factor analysis was used to determine the construct validity of a measure. The factor structure was estimated through the exploratory factor analysis.

Exploratory Factor Analysis: To estimate the factor structure of the Bangla *SHQ*, 11 items were subjected to the *exploratory factor analysis (EFA)*. Before subjected to *EFA*, data were examined to determine whether it would be suitable for factor analysis or not. The correlation matrix of 11 items revealed that a good number of coefficient were .30 and above (50%) and no high coefficient (above .90 which possess the problem of the multicollinearity). The determinant value was .048 which was greater than the recommended value of the determinant .0001 (Yong & Pearce, 2013). The *Kaiser-Meyer-Olkin (KMO)* measure of sampling adequacy and the *Bartlett's test of sphericity* was calculated to test the suitability of the data for factor analysis. Results is presented in Table 3.

Table 3 Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and the Bartlett's test of sphericity

Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy		.840
Bartlett's test of sphericity	Approximate Chi-Square	437.861
	df	55
	Sig.	.001

Results from Table 3 indicated that the *KMO measure of sampling adequacy* indicated a value of .840 which exceeded the recommended value of 0.50 (Brett, Brown, & Onsmann, 2010). The *Bartlett's test of sphericity* indicated a *Chi-Square* value of 437.861 with *df* =55 ($p < .001$). All these together suggested that the data were suitable for *EFA*.

In the present study, items that had minimum factor loading .4 or >.4 are retained as item. Components those had a minimal *eigen* value of 1 or >1 and at least 3 or more items meeting

Psychometric Evaluation of the Study Habits Questionnaire for University Students

the criteria equal to .40 or >.40 were considered as factor. Total variance explained by extracted components is presented in Table 4.

Table 4 Total variance explained by extracted factors

Component	Initial Eigen Value		
	Total	% of Variance	Cumulative %
1	4.115	37.410	37.410
2	1.220	11.088	48.498
3	.977	8.883	57.380
4	.889	8.083	65.463
5	.776	7.057	72.520
6	.647	5.884	78.404
7	.605	5.502	83.906
8	.519	4.721	88.627
9	.483	4.392	93.019
10	.431	3.917	96.936
11	.337	3.064	100.00

Results from Table 4 shows that the analysis with *Eigen value* > 1.00 extracted 2 factors accounted for 48.498% variance. The first factor explained 37.41% and the second factor explained 11.088% variance. Component matrix of the *SHQ* are presented in Table 5.

Table 5 Component Matrix

Items	Component	
	1	2
Item 1	.600	
Item 2	.667	-.527
Item 3	.619	-.445
Item 4	.688	
Item 5	.587	-.474
Item 6	.640	
Item 7	.571	
Item 8	.609	
Item 9	.618	
Item 11	.590	
Item 12	.522	

Extraction Method: Principal Component Analysis, 2 Component Extracted

Results from Table 5 shows that the Factor 1 composed of all items of the Bangla *SHQ* and the Factor 2 composed of item 2, 3, and 5. Factor loadings in Factor 1 ranged from .522 (for item 12) to .688 (for item 4) and in Factor 2 ranged from -.527 (for item 2) to -.447 (for item 3). Table 5 also showed that item 2, 3, 5 were cross loaded on both Factor 1 and Factor 2 with loadings of .667 and -.527, .619 and -.445, and .587 and -.474, respectively. We grouped item

Psychometric Evaluation of the Study Habits Questionnaire for University Students

2, 3, and 5 under Factor 1 as these had higher factor loadings. So, the Factor 2 was excluded without dropping any item. We termed the Factor 1 as ‘Study Habit’.

Predictive validity: The predictive validity is a way to validate a new or adapted measure through correlating with concrete outcomes. Data were subjected to the *Pearson Product*

Moment Correlation Coefficient to see the correlation between the Bangla *SHQ* and academic achievement as to determine the predictive validity of the measure. Result is presented in Table 6.

Table 6 Correlation matrix

Variables	Academic Achievement
Study Habit	.544**
<i>N</i> = 104, ** <i>p</i> < .01	

Table 6 shows that students’ academic achievement and the Bangla *SHQ*’s scores were significantly and positively correlated. So, data was subjected to simple regression analysis to examine the direction of study habits’ effect on academic achievement. Regression analysis result is presented in Table 7.

Table 7 Results of regression analysis of academic achievement for study habits

Model	Unstandardized Coefficients		Standardized Coefficients	t-value	Sig.
	<i>B</i>	Std. Error	β		
Study Habit	.023	.004	.54	6.55	.001
$R^2 = .30$, Adjusted $R^2 = .29$, $F_{(1,102)} = 40.03$, $p < .001$					
Dependent variable: Academic achievement					

Results from Table 7 suggested study habits as strong predictor of academic achievement. It explained total 30% variance. Table 7 also shows that academic achievement was significantly positively influenced by study habits ($\beta = .54$, $p < .001$). These findings suggested the predictive validity of the Bangla *SHQ*.

Determining Reliability

Internal Consistency Reliability:

Data for 11 items of the Bangla *SHQ* were subjected to the *item analysis* again to estimate the *Cronbach’s Alpha* and split half-reliability through *Spearman-Brown* formula. The *Cronbach’s Alpha* for the Bangla *SHQ* was .828 and the split-half reliability was .857.

DISCUSSION

The present study was aimed to estimate the psychometric properties of the Study Habits Questionnaire in Bangladeshi culture for university students in response to scarcity of the standardized measures for Bangladeshi university students. Findings from Table 2 showed that item-total correlations of items ranged from -.114 to .564. Only, item 10 had negative item-total correlation though it was positively worded and dropped from the measure in further analysis. An item-total correlation value less than .3 indicates the corresponding item does not correlate very well with overall score (Field, 2017). So, we proceeded toward further analysis as 11 items of the *SHQ* had satisfactorily item-total correlations. Results from Table 3 suggested that data were suitable for factor analysis as the *KMO measure of sampling*

Psychometric Evaluation of the Study Habits Questionnaire for University Students

adequacy exceeded the recommended value of .50 (Brett et al., 2010) and the *Bartlett's test of sphericity* had significant value. Results from Table 4 indicated that the *EFA* extracted 2 factors, according to the criterion of minimal *eigen value* 1 or >1, which accounted for 48.498% of total variance. However, component matrix presented in Table 5 suggested that Factor 1 composed of all 11 items and Factor 2 composed of item 2, 3, and 5 which are cross-loaded. Item 2, 3, and 5 had relatively smaller factor loadings for Factor 2 than Factor 1. So, the Factor 2 was excluded and Factor 1 was labelled as 'Study Habit'. Factor loadings of the measure were ranged from .522 (for item 12) to .688 (for item 4) that all exceeded the rules of thumb to be included in a factor (minimum loading for item must be $\geq .40$). Results from Table 6 suggested that study habits significantly correlated with students' academic achievement. Table 7 showed that study habits explained 30% variance of the academic achievement and that study habits was positive predictor of the academic achievement. These findings suggested that the Bangla *SHQ* had predictive validity. Some past studies also suggested significant relationship between study habits and academic achievement (Ch, 2006; Crede & Kuncel, 2008; Oluwatimilehin & Owoyele, 2012; Kumari & Chamundeswari, 2015; Siah & Maiyo, 2015; Sherfat & Murthy, 2016; Chilca, 2017).

After estimating factorial validity, the internal consistency reliability and split-half reliability were estimated. The *Cronbach's Alpha* of the Bangla *SHQ* was .828. As a rule of thumb, a reliability of .70 or higher is expected before it will use in an instrument (Nunnally, 1978). Kilne (2000) suggested that alpha less than .50 is unacceptable, .50 to .60 is poor, .60 to .70 is acceptable, .70 to .90 is good, and above .90 is excellent. From that point of view, the Bangla *SHQ* had good internal consistency reliability. The split-half reliability using *Spearman-Brown Formula* was .857. As a rule of thumb, split-half reliability value .80 or high is adequate enough. Both the *Cronbach's Alpha* and split-half reliability values suggested the Bangla Study Habits Questionnaire as highly reliable measure.

Finally, this study provides us a psychometric tool to measure study habits of Bangladeshi university students. This measure would be helpful to identify students' strengths and weaknesses in studying. Students, teachers, guardians would be able to manipulate and take necessary steps for getting better academic output. However, the present study had some limitations. The study sample was not selected from universities across the country. So, users of this measure should be careful to generalize the reliability and validity all across the country. A larger and more exhaustive sample selected from universities across the country will be require to establish the norm and to examine the reliability and validity of measure.

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Psychometric Evaluation of the Study Habits Questionnaire for University Students

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Psychometric Evaluation of the Study Habits Questionnaire for University Students

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Conflict of Interest

The authors clearly declared this paper to bear no conflict of interests

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