

# Model of Factors Affecting Active Learning Behavior: Context of Three Southern Border Provinces of Thailand

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## Abstract

The purpose of this paper is to examine the structure of factors affecting active learning behavior for Islamic studies students' in three southern border provinces of Thailand. Data were collected from 300 undergraduate students by using a questionnaire. The samples were from three universities in three southern border provinces of Thailand. The Structural Equation Modelling (SEM) was employed to develop the model. Exploratory factor analysis and confirmatory factor analysis were utilized to identify the underlying factors and test the construct reliability and convergent validity. The results show that the factors affecting active learning behavior (FAALB) model was found to be fit and reliable and all parameter estimates was a valid construct, the values of TLI, CFI, IFI and NFI were more than the cut-off point, the  $\chi^2/df$  and RMSEA also achieved the suggested value. The study found evidence that active learning behavior is influenced by psychological states.

**Keywords:** Active learning Behavior, Structural Equation Modelling, Thai Southern Border Province

## Introduction

Active learning is a broad concept that covers or is associated with a wide variety of learning strategies. Active learning has been a popular concept in education in Thailand over the last few decades and it is highly. It is a vision of education in Thailand to encourage its people into developing a learning society by focusing on the development of standard quality, increasing educational opportunities for learners and promoting active-learning behavior in students of all levels especially in higher education (Office of the Higher Education Commission, 2015; Ministry of Education, 2008). Active learning behavior in individual student will enhance student's cognition and understanding of course content, as active learning provides opportunities for student to talk, read, write and reflect as they approach the course content (John, Jeffrey & Anna, 2000; Meyers & Jones, 1993; Bellanca & Brandit, 2010). Consequently, active learning has attracted strong support among instructors who are

looking for alternatives to replace traditional teaching styles. Therefore, the learning behavior of students must be taken into priority consideration.

However, behavior and learning theorists agree that the differences among learners and in the environment can affect learning, but they diverge in the relative emphasis (Dale, 2004). In addition to that, a virtual learning environment can provide an inspiration of learning that will support student behavior (Webb & Moallem, 2016). There are several social and cognitive theories that identified the factors influencing active learning. For the purpose of this study, the “Interactionism theory” put forward by Magnusson and Endler (1977) was applied to investigate the interactional dimension in the psychological and behavioral points of view in understanding active learning behavior, which include: biological approach, personality approach, behavioral approach, and interaction approach. Endler (1983) described that interactionism can be studied in the context of controversial personality issues such as consistency versus specificity, mediating versus reaction variables, and so forth.

Therefore this study attempts to address the previous concern by examining the influence of situational, personality and religious teaching factors to students’ active learning behavior and the relationship among the different factors. The specific objectives are 1) to explore the underlying structure of factors affecting active learning behavior; 2) to examine the relationship between religious teaching and active learning behavior; and 3) to examine the relationship between psychological states and active learning behavior. The conceptual framework in this study is primarily constructed based on the theory of interactionism model which proposed by Magnusson and Endler (1977). To describe the relationship between factors that influence active learning behavior, we hypothesized that: H1: Active learning behavior is influenced by psychological states, H2: Internal factor leads to increase psychological states and H3: Effect of Islamic factor leads to increase psychological states

## Research Methodology

**Sample:** The sample of this study was obtained from 300 undergraduate students of Islamic Studies program from three higher education institutions in three southern border provinces of Thailand. The data was collected between January until May 2016, which involved about 77.3% of the total number of female students and 32.7% of male students. The sample was a representative of the gender composition found in the universities in the southern border provinces of Thailand. A large majority of samples were 2<sup>nd</sup> year (30%) and 3<sup>rd</sup> year (30.3%) degree students, while the remaining were 1<sup>st</sup> year (21%) and 4<sup>th</sup> year (18.7%) students. The sample size was deemed adequate to address the research objectives and to run the structural equation modelling (Hoyle, 1995; Kline, 1998)

**Instrument:** The instrument that was developed for this study was based on the reviewed literature. The students were asked to indicate how strongly they agreed with each statement provided in the questionnaire. They were asked to tick one box using a six-point, positively-packed agreement response rating scale in the column. This response scale included two negative and four positive agreement responses with identical scores (e.g., strongly disagree = 1, mostly disagree = 2, slightly agree = 3, moderately agree = 4, mostly agree = 5, and strongly agree = 6) since rating scales are known to generate discrimination in contexts of social desirability (Brown, 2004; Lam & Klockars, 1982). The items were first content-validated by 5 experts prior to being selected for the present study. Then the Index of item objective congruence (IOC) was calculated and the questions with the corresponding index of 0.60 and above were selected. After that, group of students (about 30 persons) who were not sample in this study were tried out and then the discrimination and reliability were analyzed for Cronbach’s Alpha Coefficient.

**Procedures of Data Analysis:** The study first tested the measurement models of the three-factor model, which was tested to create the adequacy of the hypothesized measurement

model. Data screening was conducted which involved checking of data accuracy input, addressing missing values, and determining normality and eliminating outliers. After that the analysis continued with the assessment of reliability and validity. The data went through Exploratory Factor Analysis (EFA) to establish the underlying constructs and followed by Confirmatory Factor Analysis (CFA) using the AMOS (version 20.0) model-fitting program which was applied to validate the measurement models. The models were estimated on the basis of the covariance matrix derived from the data. The maximum likelihood estimation procedure was adopted to produce estimates of defensible properties. The result from the analysis was assessed using standards for a good-fit CFA, which included: consistency of the measurement model with the data, and reasonableness of the parameter estimates. The analysis used the relative chi-square ( $\chi^2/df$ ) with a value of below 5 is considered acceptable, RMSEA (Root Mean Square Error of Approximation) below .08, while a Comparative Fit Index (CFI), Incremental Fit Index (IFI), Normed Fit Index (NFI), and Tucker-Lewis Index (TLI) all these values should be above .90 to demonstrate a good fit (Kline, 2011; Hu & Bentler, 2009).

## Results and Interpretation

### Exploratory Factor Analysis on the FAALB

Exploratory factor analysis (EFA) was carried out to verify the formulation on the FAALB construct. Through this EFA, items with a low factor loading would be dropped out to construct the main factor (Hair, 2010). This process was considered significant as it would make the data more explicit for the following analysis. Additionally, the PCA affirmed the presence of the three factors with eigenvalues exceeding 1, clarifying a total of 68.381 percent of the variance and this was considered firm by Tabachnick and Fidell (2006) as well as Beavers et.al, (2013). All the 12 items of the FAALB were manipulated to the underlying construct using the Statistical Package for the Social Science (SPSS) Version 16.0. Firstly, before operating the EFA, the fitness of data for factor analysis was determined to verify the existence of coefficients values with all values exceeding 0.5 indicated that the sample size was adequate (Hair et al., 2009). The Kaiser-Meyer-Oklin (KMO) measure of sampling adequacy value was .830, which exceeded the recommended cutoff value of .60 and was considered as meritorious (Kaiser, 1974). The Bartlett's Test of Sphericity also reached statistical significance, which was  $p < .05$ , supporting the factorability of the correlation matrix, and indicated that the correlation between items was acceptable to run the factor analysis. At this step several items were deleted because they have low factor loadings and below than 0.50. Therefore, only these 12 items have evidence of indicators measuring the same latent construct.

**Table 1** Mean standard deviation and factor loading and reliability of the three-factor constructs

Code Items		Alpha	Mean	S.D.	Factor Loading
	<b>1) Situation Factor</b>	.846			
A12	I have a good environment which encourages me to be active in learning		5.02	.867	.832
A14	My family always support me in learning		5.31	.817	.803
A15	My lecturer has a great interaction with students in the class		5.14	.854	.835

**Table 1** (Con.)

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A14	My family always support me in learning	.846	5.31	.817	.803
A15	My lecturer has a great interaction with students in the class		5.14	.854	.835
A16	My lecturer looks very active in enlightening new knowledge to us		5.33	.790	.778
<b>2) Internal Factor</b>					
B_6	I intend to study hard because I would like to have a good career in the future.		5.08	.797	.839
B_7	Keep learning is the best way to make our life beneficial to other people	.834	4.74	.757	.813
B_8	I love to read a book in my free time		5.01	.763	.805
B_11	I feel confident when facing with any threat		5.03	.731	.715
<b>3) Islamic Factor</b>					
D1	I intend to follow the advice of my religious teaching in all aspects		5.40	.736	.772
D2	Quran and Hadith encourage me to learn more and active in learning	.844	5.32	.744	.846
D3	I strongly believe that I can be a better Muslim by keep on learning		5.43	.735	.843
D4	I am willing to learn more when I get some motivation from Islamic view		5.52	.710	.784

From Table 1, it can be seen that all the items have factor loadings ranging from .715-.846, the value of Cronbach's alpha was reasonably high. The value of the reliability index was between .834-.846 which exceeded the critical cut-score as a rule of thumb, the acceptable Cronbach's alpha value was at least 0.7 (Hair et al., 2009).

#### **Measurement Validity of Factors Affecting Active Learning Behavior Questionnaire**

To test the validity of the active learning behavior questionnaire, result showing the goodness of fit of the three-factor structure model yielded the expected result as the variance-covariance matrix  $\chi^2/df = 1.860$ ; CFI = .971; RMSEA = .054; IFI = .972; NFI = .940; TLI = .963, these statistics suggest that the measurement model of factors affecting active learning behavior was consistent with the data (Kline, 2011; Kaplan, 2009). Moreover, all items have loading of more than 0.50 and ranged from 0.67-0.85, of which the factor loading are acceptable and by using the rule of thumb of at least three indicators per construct (Hair et al. 2009). Meanwhile, the interaction between independent variables is ranging from 0.29-0.42. Therefore, there was an evidence to support the validity of a common factor, all indicators are related to their constructs and thus there is satisfactory proof of convergent validity of the model.

**Table 2** Convergent Validity, Discriminant Validity and Inter-Factor Correlations

Construct	FSituational	FInternal	FIslamic
1 FSituational	0.59	0.18	0.08
2 FInternal	0.42	0.56	0.12
3 FIslamic	0.29	0.34	0.58
<b>Composite Reliability (CR)</b>	0.849	0.835	0.845

This table 2 shows additional evidence with respect to the construct validity of the measurement model in terms of its convergent validity and discriminant validity. The diagonal values (Shaded cells) represent the average variance extracted (AVE) for each construct which must have a value of at least 0.5 (Diamantopoulos & Siguaw, 2000). In addition, below the diagonal is the correlation matrix; above the diagonal is the shared variance matrix which all AVEs were larger than the shared variances. And finally, the researcher evaluated the composite reliability (CR) of factors affecting active learning behavior model, which the cut-off value of CR must be above 0.6. Since composite value of this construct are between 0.835-0.849 which all are above 0.6, meant that all the measures consistently represented the same latent construct.

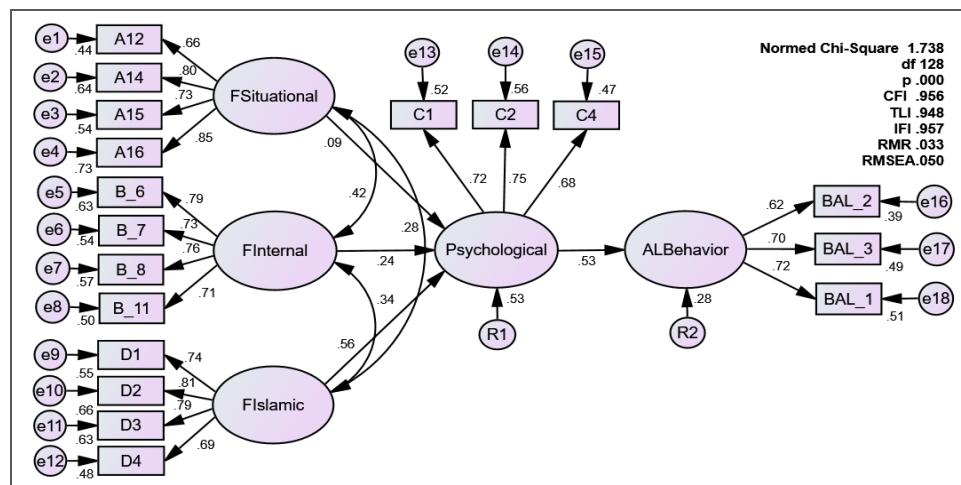
### Adequacy of the Hypothesized Factors Affecting Active Learning Behavior Structural Model

The summarizes the Structural Equation Modelling results of factors affecting active learning behavior which mediated by Psychological and causal relation to Active Learning Behavior. The model had addressed all hypotheses as follow:

**Table 3** The fit indices for the Hypothesized Model

Fit Index	X <sup>2</sup> /DF (≤ 5.0)	TLI (≥ 0.9)	CFI (≥ 0.9)	IFI (≥ 0.9)	NFI (≥ 0.9)	RMSEA (≤ 0.08)
Value	1.738	0.948	0.956	0.957	0.904	0.050

Table 3 shows the Modification Index of the Hypothesized model as all the fit indices were acceptable value. In conclusion, can say that the hypothesized structural model of FAALB fit the collected data. All these fit indices satisfied their critical cut-scores (Kline, 2011). The Proposed of the hypothesized factors affecting Active learning behavior as shown in following figure:

**Figure 1** SEM result of the Hypothesized Active learning behavior Model

Finally, the result of the Structural Equation Modelling for FAALB, indicated that the overall statistic value of the model was good, only the direct effect of FEnvironment→Psychological was extremely low (.09) and statistically not significant ( $P=.171$ ) which did not meet the threshold of .20 for standardized path coefficient (Hair et al., 2010). However the results indicated a fitting model of relationship between effect of internal factor to psychological state, Islamic factor to psychological state and psychological state to Active learning behavior, which all analysis results supported the expected causal relationships of the research hypothesis. Additionally, the analysis revealed all variables explained 28% of the variability of the reported Active Learning Behavior among the respondents. The parameter estimates of the hypothesized model were free from offending values with uncorrelated errors. And all path coefficients of the causal structure except situational factor were statistically significant at .01 level. The standardized path coefficient of Psychological →ALBehavior was substantial and statistically significant,  $\beta = 0.53$ . Meanwhile, after considering the suggested Modification Indices of this model, the correlation of the error did not improve the model to be better, thus there are no strong theoretical evidence to correlate the suggested covariance. In conclusion, the summary of hypothesis the results of SEM analysis hypothesis testing all analysis results supported the expected causal relationships among the interaction of factors affecting active learning behavior variables.

## **Discussion and Conclusion**

Results analysis of the FAALB model showed that it supported the expected relationships between the factors and active learning behavior. Particularly, this study found that Islamic teaching of individual student was systematically associated with active learning behavior. The result of interaction of personality factor that leads to the increase in active learning behavior through psychological states also supported the previous works of Chuchipwatna (2015), Yaemyuean, (2016) and Popun (2012) in the similar context. This research further extended the current understanding on the effect of some psychological factors including self-efficacy, attitude towards learning and belief in internal locus, and the result was in line with the findings of Choo, Linderman and Schroeder (2007) which found that the teaching psychological mechanism has effect to the knowledge creation of student, meanwhile the method mechanism directly influences learning behaviors, but the value of a method may lie in modifying the learning behaviors that subsequently create knowledge. However, Islamic teaching did not have a direct effect towards active learning behavior but its indirect effect resulted in a high score in the analysis. Additionally, students' psychological state was found to be a strong driver of active learning behavior; and if the investigation of psychological mechanism is a function of direct experience in promoting active learning, then this finding attributes some interest. The finding of this point shows that we need to revise the curriculum in terms of the implementation of psychology mechanism and encouraging active learning through Islamic teaching procedure in higher education.

Further studies are therefore recommended to consider other related factors affecting active learning behavior in order to provide more insight and deepen. And also recommended for further research to be pursued on more diverse sample, as to test the validity of the model across different samples so the result of the study could be generalized.

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