

# USING STRUCTURE EQUATION MODELLING TO VALIDATE FINANCIAL LITERACY QUESTIONNAIRE AMONG ECONOMICS STUDENTS

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**ABSTRACT:** *The aims of the study was to develop a questionnaire and examine its reliability and validity. through an analysis based on Structure Equation Modelling with Confirmatory Factor Analysis. The theories of mobile cartoons are focused on Vygotsky Social Learning Theory and Multimedia Learning Theory. This attempt was to create a valid and reliable instrument to measure financial literacy among Economics students. A total of 191 Economics undergraduates from one public university in Malaysia was employed as samples. The instrument was a 30-item questionnaire. The findings from the Exploratory Factor Analysis retained three factors; which were financial planning, credit card and ways of saving. This model was tested by Confirmatory Factor Analysis and the revised model indicated a very good fit and internal consistency estimated by Cronbach's Alpha which was considered adequate for each factor. This study employed SEM to validate a final model for financial literacy, and this model can be used for future research. The results from this study may assist students to develop a proper financial management. It also may assist faculty in designing financial literacy course to help students to plan their budget wisely.*

**Keywords:** Economic Students, Financial Literacy, Structure Equation Modelling, Validate

## 1- INTRODUCTION

Most young millennials often struggle to overcome financial hurdles. According to Badrul[2], over 47% bankruptcies in Malaysia were young adults aged between 18 to 35 years old. As a result, Malaysia's household debt has become the highest among developing Asian countries. Opletatalova [15] reported that the major issue of financial problem is due to poor financial literacy. This report also highlighted that the young generation still struggles to save money.

According to Kramer,[9] an important finding from research showed that financial literacy is widespread and affects the quality of financial decision making<sup>1</sup>. Therefore, an awareness of the importance of financial literacy has increased in some countries, such as Australia, Canada and United Kingdom. [16] Since a majority of bankruptcies occur among young adults, the increase of public awareness on financial literacy has attracted researchers to design more effective teaching in universities courses. The Ministry of Education in Malaysia has instilled financial literacy in Moral Education decades ago, however, the allocation of the time is very little. On the other hand, financial economics curriculum has only focused on a very small aspect of financial literacy. Therefore, instilling the basic knowledge of financial literacy for Economics is workable.

The technological advancement becomes part of the global trend towards using technology to enhance students' learning. Mobile phone is one of the most popular gadgets among the electronic devices [24]. This report indicated that more than 85% of adults own a mobile phone. Furthermore, researchers believe that mobile learning is the newest technology to achieve optimum learning advantages (Abachi &

Muhammad) [1] by providing opportunities for lecturers as well as learners to access materials and engage in two-way interaction through mobile devices at any time and any place. However, the big challenge is how to enhance the students' financial literacy through mobile learning?

The integration of mobile learning with concept cartoons has been selected because concept cartoons are related to daily life. Using concept cartoons helps developing students' idea and encouraging students to discuss [4;13;14]. Prior studies showed that research in concept cartoons are usually examined in Mathematics, Sciences or languages [3;8;20;21;22]. There is only a small number of studies concerning financial literacy in the literature.

Mobile learning has been revealed as one of the effective ways to involve learners due to the current technological trend that has been increasing globally [12]. Since mobile learning has a potential to improve teaching and learning, a new learning approach integrated with cartoons based on financial literacy storyline can be implemented. However, it is interesting to know which variables have influence on financial literacy. SEM provides the ability to assess the unidimensionality, reliability and validity of each individual construct [5;8;10]. The selected variable after running the SEM will give greater flexibility to the researcher to develop a hypothesis about the construct structure [15].

## RESEARCH OBJECTIVE

The main aim of the paper is to develop a questionnaire on financial literacy and examine its reliability and validity through an analysis based on Structure Equation Modelling (SEM) with Confirmatory Factor Analysis (CFA).

## 2- RESEARCH MODEL

The four-factor research model as shown in Figure 1, describes the components of the questionnaire on financial

literacy (financial planning, credit card, ways of saving and saving). These paths were related to causal processes. Thus, structural equation modeling (SEM) procedures were used to examine these components [10].

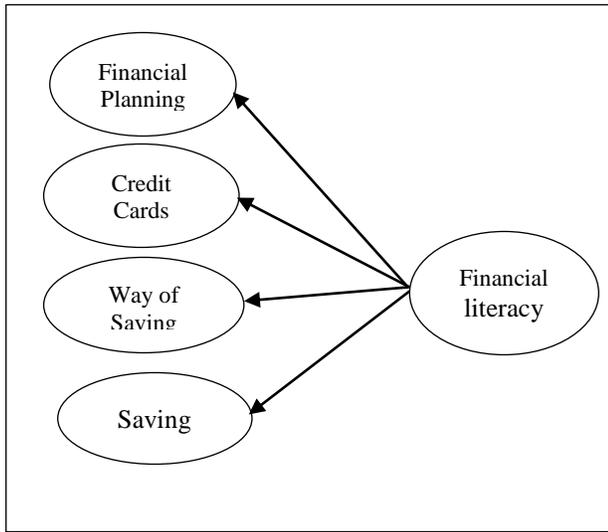


Figure 1: Four-factor Research Model

**3- MATERIAL AND METHODS**

Structural Equation Modelling selected with the Confirmatory Factor Analysis has been employed as the research method. The variable after running the SEM will give greater flexibility to the researcher to develop a hypothesis about the construct structure [15].

This study employed 191 Economics undergraduates from one public university in Malaysia as samples. The samples consisted of first-year Economics students. The samples of this study were selected randomly in order to eliminate extraneous variables. In order to test the validity and reliability, a questionnaire was developed for this paper.

**The Instrument**

The questionnaire was modified from Jorgensen [9] for the financial literacy part. The modification was made based on the students' background, education level and nationality culture. This instrument has developed based on the research model in order to have a clearer picture of financial literacy. The questionnaire consisted of two parts: demographic information and financial literacy. The demographic information in section A included three items. The items were age, gender and ethnic group, followed by section B, comprising 30 closed-ended questions of financial literacy. The items were constructed according to the principles proposed by Gay, Mills and Arasian [7]. Most of the items were directly related and positively stated to financial literacy elements except items 7 and 10. The 30 items for financial literacy were measured by five-point Likert scale. Scores were encrypted ranging from 1-5 (1,

“strongly disagree”; 2, “disagree”; 3, “neutral”, 4, “agree”, and 5,“ strongly agree”).

**Table 1: The Analysis of Factor Analysis**

Item	Factor			Commonalities
	1	2	3	
p11	.804			.469
p25	.713			.701
p17	.667			.709
p3	.641			.752
p13	.614			.810
p18	.537			.704
p19	.443			.671
p8		.809		.837
p9		.758		.830
p23		.644		.758
p4			.652	.741
p26			.585	.651
p16			.419	.762

**4-RESULTS**

Prior to employing the SEM, the assumption of linearity was carried out to check the normality of the data. The skewness

**Figure 1: Model 1**

**Figure 3: Model 2**

and kurtosis test was conducted to examine the normality of the data. Exploratory Factor Analysis of varimax components analysis with extraction method was explained using the correlation matrix. The analysis from the KMO and Bartlett's Test was .745 (p< .05) indicating sufficient items from each factor. In other words, the results indicated the correlations matrix is significantly different from an identity matrix, in which correlations between variables is zero.

The findings of the Pearson correlation of the items with the overall score and values of alpha without the item. The highest correlation of the item was item 16 (r=.651) which explained 73.2% of the variance whereas, the lowest correlation of the item was item 7 (r=.287) which only explained 58.8% of the variance. In addition, the Cronbach alpha was carried out to examine the internal consistency of the 30 items. The result indicated .907. indicated a high consistency level. This result is in line with standard benchmark where an instrument with the coefficient .70 and above is considered reliable.

The exploratory factor analysis was carried out for the 30-item questionnaire and four factors were requested based on the items which were designed to index four constructs: financial planning, credit card, ways for saving money and saving. The result of the existence of four factors explaining Figure 2:

those factors with loadings more than .3 were selected into the model of CFA. For those factors with loadings less than .3, extraction has been done.

The factor analysis with varimax allowed the selection of four factors with latent roots greater than 1. However, factor four had only two indicators, therefore it was not considered in the calculation. A total of 44.87% of the total variance have been explained by the three factors. The first factor- “financial planning” explains the majority of the whole variability. The first factor financial planning explained 28.673% of the variance. These factors refer to p11. house planning, p 25. manage money, p17. saving insurance, p3. saving plan, p13. life insurance, p18. check before shopping, and p19. keep track on spending.

Factor two refers to a credit card, explained 9.795% of the variance. Items include p8. credit cards are safe, p9. spend money by credit card and p23. shop with a credit card. Factor three refers to ways for saving money, explained 6.402% of the variance. A few items included in this factor are; p4. financial control, p26. learn to save money and p16. control

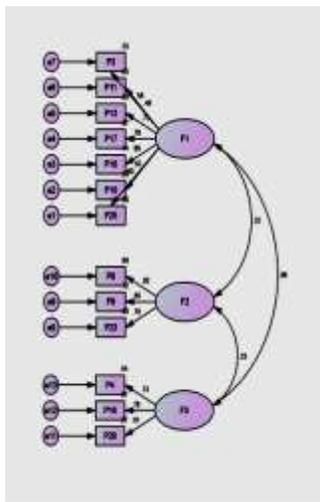


Figure 1: Model 1

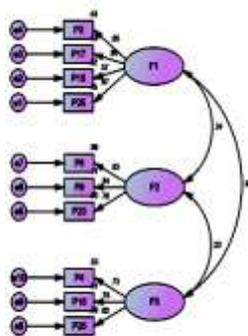


Figure 3: Model 2

spending.

**Confirmatory Factor Analysis to Verify Models by Structural Equation Models**

The confirmatory factor analysis was employed to improve the questionnaire through structural models configuration based on the criteria of maximum likelihood according to the multivariate normality criteria of the items. Modification of the model was generated from the analysis of variation of parameter estimates, residual values and modification test. In this study, the three factors model that was built from the exploratory factor analysis was tested. Refer to Figure 2, the model only meets the minimum criteria of the fitness of the model with the chi square (CMIN/df= 2.398). However, the results of the analysis of the fitness of the model are not encouraging. The value of CFI=.823 and GFI=.809 are both lower than .9, and RMSEA =.125. According to Khine [10] the value of RMSEA that is above 0.10 is considered as a poor fit. Therefore, the model needs to be revised in order to present the statistical significant discrepancies.

The revised Model 2 was presented in Figure 3. Items 11, 13 and 19 from the F1 were excluded due to low loadings. From the findings, the overall goodness of fit of the model has improved, Chi-square/df = 1.579, CFI =.944, GFI =.909, RMSEA =.070.

**5.DISCUSSION AND CONCLUSION**

The exploratory factor analysis was employed to verify the 30-item questionnaire but only 10 items were retained with three factors after using the factorial analysis by principal component with varimax rotation. Even though only one third of the items were retained, those questions still can represent each factor. According to Brown [4], a factor with 3 items is considered reliable. The three factors explained 44.87% of the total variance. The analysis also showed a positive correlation ranging from .287 to .651. The confirmatory factorial analysis was performed on two models, whereby Model 2 has showed a very good fit with the indexes (Chi-square/df = 1.579, CFI =.944, GFI =.909, RMSEA =.080). The internal consistency estimated by Cronbach’s Alpha is considered adequate for each factor.

The remained three factors, financial planing, credit card and way of saving formed the research model in line with the previous literature review [23].

The questionnaire of financial literacy was designed to enhance the financial literacy among young generation. It has the similarities with the survey developed by Jorgensen [9] in term of measuring the undergraduates financial literacy. However, this questionnaire has developed based on the literature reviews and prior research on Malaysian youth’s spending behaviours. It also an important instrument for scientific research in financial education. This study employed SEM to validate a final model for financial literacy, and this model can be used for future research.

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