

# Quest for Research Excellence On Computing, Mathematics and Statistics

**Editors**

Kor Liew Kee

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**Quest for Research Excellence on Computing,  
Mathematics and Statistics**

**Chapters in Book**

The 2<sup>nd</sup> International Conference on Computing, Mathematics  
and Statistics (iCMS2015)

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# Content

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*Preface*

<b>CHAPTER 1 .....</b>	<b>1</b>
Towards Ameliorating the Problem of Packet Dropping in IDS using P System Model on GPU	
<i>Rufai Kazeem Idowu, Ravie Chandren M., and Zulaiha Ali Othman</i>	
<b>CHAPTER 2 .....</b>	<b>11</b>
Analyses of Software Testing Problems in Small and Medium Software Enterprises (SME's) and a Proposed Framework on Exploratory Testing	
<i>Murugan Thangiah and Shuib Basri</i>	
<b>CHAPTER 3 .....</b>	<b>25</b>
Senior Citizen and Online Form: Hybrid Guideline Form Design	
<i>Zanariah Idrus, Nor Hafizah Abdul Razak, and Noor Hasnita Abdul Talib</i>	
<b>CHAPTER 4 .....</b>	<b>35</b>
Research Paradigms in Computing Disciplines: A Review	
<i>Nor Hafizah Abdul Razak, Noor Hasnita Abdul Talib, and Jasmin Ilyani Ahmad</i>	
<b>CHAPTER 5 .....</b>	<b>41</b>
Dijkstra's Algorithm In Product Searching System (Prosearch)	
<i>Nur Hasni Nasrudin, Siti Hajar Nasaruddin, Syarifah Syafiqah Wafa Syed Abdul Halim and Rosida Ahmad Junid</i>	
<b>CHAPTER 6 .....</b>	<b>49</b>
Developing Waqf Land Computing: A Preliminary Study On The Used Of Web-based Applications And Spatial Database	
<i>Siti Nurbaya Ismail, Zanariah Idrus, Nor Hafizah Abdul Razak</i>	

<b>CHAPTER 7</b> .....	<b>59</b>
Implementation Of CORDIC Algorithm In Vectoring Mode <i>Anis Shahida Mokhtar, Abdullah bin Mohd Fadzullah</i>	
<b>CHAPTER 8</b> .....	<b>71</b>
A Description of Projective Contractions in the Orlicz-Kantorovich Lattice <i>Inomjon Ganiev and M. Azram</i>	
<b>CHAPTER 9</b> .....	<b>83</b>
The Geometry of the Accessible Sets of Vector Fields <i>A.Y.Narmanov, and I. Ganiev</i>	
<b>CHAPTER 10</b> .....	<b>89</b>
Existence Result of Third Order Functional Random Integro-Differential Inclusion <i>D. S. Palimkar</i>	
<b>CHAPTER 11</b> .....	<b>105</b>
Fourth Order Random Differential Equation <i>D. S. Palimkar and P.R. Shinde</i>	
<b>CHAPTER 12</b> .....	<b>115</b>
New Concept of $e$ - $I$ -open and $e$ - $I$ -Continuous Functions <i>W.F. Al-omeri, M.S. Md. Noorani, and A. AL-Omari</i>	
<b>CHAPTER 13</b> .....	<b>123</b>
Visualization of Constrained Data by Rational Cubic Ball Function <i>Wan Zafira Ezza Wan Zakaria, and JamaludinMd Ali</i>	
<b>CHAPTER 14</b> .....	<b>133</b>
Octupole Vibrations in Even–Even Isotopes of Dy <i>A.A. Okhunov, G.I. Turaeva, and M. Jahangir Alam</i>	
<b>CHAPTER 15</b> .....	<b>141</b>
Characterization of $p$ -Groups with a Maximal Irredundant 10-Covering <i>Rawdah Adawiyah Tarmizi and Hajar Sulaiman</i>	

<b>CHAPTER 16</b> .....	<b>149</b>
Sensitivity Index of HIV-1 model Parameters with Vertical transmission	
<i>Amiru Sule, Mamman Mamuda, Abdullahi Mohammed Baba, Jibril Lawal, and I.G. Usman</i>	
<b>CHAPTER 17</b> .....	<b>163</b>
Derivation of Four-Point Explicit Block Methods for Direct Solution of Initial Value Problems of Third Order Ordinary Differential Equations	
<i>Z. Omar, J. O. Kuboye, and Y.A. Abdullah</i>	
<b>CHAPTER 18</b> .....	<b>175</b>
Absolute Translativity of Generalized Nörlund Mean	
<i>Amjed Zraiqat</i>	
<b>CHAPTER 19</b> .....	<b>189</b>
Type I Error of the Modified Wilcoxon Signed Rank Test under Leptokurtic Distribution	
<i>Nor Aishah Ahad, Sharipah Soaad Syed Yahaya, Suhaida Abdullah, Lim Yai Fung and Zahayu Md Yusof</i>	
<b>CHAPTER 20</b> .....	<b>199</b>
The Combined EWMA-CUSUM Control Chart with Autocorrelation	
<i>Abbas Umar Farouk, and Ismail Bin Mohamad</i>	
<b>CHAPTER 21</b> .....	<b>213</b>
Estimating Philippine Dealing System Treasury (PDST) Reference Rate Yield Curves using a State-Space Representation of the Nelson-Siegel Model	
<i>Len Patrick Dominic M. Garces, and Ma. Eleanor R. Reserva</i>	
<b>CHAPTER 22</b> .....	<b>225</b>
A Structural Equation Model Analyzing the Relationship Model on Perception Students toward Mathematics	
<i>Siti Fairus Mokhtar</i>	

<b>CHAPTER 23</b> .....	<b>233</b>
Partial Least Squares Based Financial Distressed Classifying Model of Small Construction Firms	
<i>Amirah-Hazwani Abdul Rahim, Ida-Normaya M. Nasir, Abd-Razak Ahmad, and Nurazlina Abdul Rashid</i>	
<b>CHAPTER 24</b> .....	<b>245</b>
Logit Bankruptcy Model of Industrial Product Firms	
<i>Asmahani Nayan, Siti-Shuhada Ishak, and Abd-Razak Ahmad</i>	
<b>CHAPTER 25</b> .....	<b>255</b>
Data Mining in Predicting Firms Failure: A Comparative Study Using Artificial Neural Networks and Classification and Regression Tree	
<i>Norashikin Nasaruddin, Wan-Siti-Esah Che-Hussain, Asmahani Nayan, and Abd-Razak Ahmad</i>	
<b>CHAPTER 26</b> .....	<b>265</b>
Risks of Divorce: Comparison between Cox and Parametric Models	
<i>Sanizah Ahmad, Norin Rahayu Shamsuddin, Nur Niswah Naslina Azid @ Maarof, and Hasfariza Farizad</i>	
<b>CHAPTER 27</b> .....	<b>277</b>
Reliability and Construct Validity of DASS 21 using Malay Version: A Pilot Study	
<i>Kartini Kasim, Norin Rahayu Shamsuddin, Wan Zulkipli Wan Salleh, Kardina Kamaruddin, and Norazan Mohamed Ramli</i>	
<b>CHAPTER 28</b> .....	<b>285</b>
Outlier Detection in Time Series Model	
<i>Nurul Sima Mohamad Shariff, Nor Aishah Hamzah, and Karmila Hanim Kamil</i>	
<b>CHAPTER 29</b> .....	<b>297</b>
ROAD Algorithm for Control Charts	
<i>Gejza Dohnal</i>	

<b>CHAPTER 30</b> .....	<b>311</b>
Learning Numerals for Down Syndrome by applying Cognitive Principles in 3D Walkthrough	
<i>Nor Intan Shafini Nasaruddin, Khairul Nurmazianna Ismail, and Aleena Puspita A.Halim</i>	
<b>CHAPTER 31</b> .....	<b>329</b>
Predicting Currency Crisis: An Analysis on Early Warning System from Different Perspective	
<i>Nor Azuana Ramli</i>	
<b>CHAPTER 32</b> .....	<b>341</b>
Using Analytic Hierarchy Process to Rank Takaful Companies based on Health Takaful Product	
<i>Noor Hafizah Zainal Aznam, Shahida Farhan Zakaria, and Wan Asma 'a Wan Abu Bakar</i>	
<b>CHAPTER 33</b> .....	<b>349</b>
Service Discovery Mechanism for Service Continuity in Heterogeneous Network	
<i>Shaifizat Mansor, Nor Shahniza Kamal Basha, Siti Rafidah Muhamat Dawam, Noor Rasidah Ali, and Shamsul Jamel Elias</i>	
<b>CHAPTER 34</b> .....	<b>361</b>
Ranking Islamic Corporate Social Responsibility Activities under Product Development Theme using Analytic Hierarchy Process	
<i>Shahida Farhan Zakaria, Wan-Asma ' Wan-Abu-Bakar, Roshima Said, Sharifah Nazura Syed-Noh, and Abd-Razak Ahmad</i>	
<b>CHAPTER 35</b> .....	<b>369</b>
A Fuzzy Rule Base System For Mango Ripeness Classification	
<i>Ab Razak Mansor, Mahmud Othman, Noor Rasidah Ali , Khairul Adilah Ahmad, and Samsul Jamel Elias</i>	



**CHAPTER 36.....381**

**Technology Assistance for Kids with Learning Disabilities:  
Challenges and Opportunities**

*Suhailah Mohd Yusof, Noor Hasnita Abdul Talib, and Jasmin Ilyani  
Ahmad*

## CHAPTER 22

# A Structural Equation Model Analyzing the Relationship Model on Perception Students toward Mathematics

Siti Fairus Mokhtar

**Abstract.** Student performance in universities is as highly concern to government as it represents the competency towards real world situations. The aim of this study is to develop the model on perception students toward Business Mathematics course. A questionnaire was distributed to students in Kedah area. Structural Equation Modeling (SEM) approach was used to access the model fit and to test the hypothesis. The latent constructs are interest, usefulness of mathematics, role of the teacher, peers and attitude related to the performance students toward Business Mathematics course. The result shows that all latent constructs are positive correlation.

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**Keywords:** interest; SEM; performance

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# 1 Introduction

Mathematics is a difficult subject. Low pass rates in mathematics for students in South American (Mji & Makgato, 2006), Turkish (Basturk & Yavuz (2010) and United States (Clarke & Shinn; 2004). This is global issue to worldwide. Fail in mathematics need to reduce among students to become advanced country.

Rajoo (2013) showed that in Malaysia, teachers and parents want the students perform well in mathematics examinations since the importance of mathematics competency in secondary school for tertiary education has led to high expectations. Studied by Wan Ahmad and Zaman (2002) stated that learning mathematics no doubt is a challenging process. Mathematics is a difficult subject. Many factors that affect learning mathematics outcomes, whether directly, or indirectly. Students always faced mathematics problem when they studying mathematics.

Students are products of universities and become source of manpower to develop country's economy (Alfan & Othman, 2005). Students need to possess high mathematics performance and high mathematics' achievement to have high literacy in mathematics (Geary & Hamson, 2000).

Factors influence students' perception in mathematics are attitude (Hame, Bahari & Abdullah, 2008; Mokhtar, Md Yusof, Misiran; 2012), interest (Prokop, Tuncer & Chuda, 2007; Mokhtar, Md Yusof, Misiran; 2012), role of teacher (Maat & Zakaria, 2010), peers (Mokhtar, Md Yusof, Misiran; 2012) and usefulness of mathematics (Singh, 2012).

The aim of this study is to develop the model on performance students toward Business Mathematics course.

## 2 Method

### 2.1 Respondents and Procedures

There were 400 questionnaires were distributed to respondents. This study uses stratified sampling method. The respondents were explaining the importance and the relevance of the study. The subjects were assured that their responses would be kept confidential and will be utilized only for the purpose of research. They were asked to fill up the questionnaire by themselves according to the instructions written on the questionnaire. The respondents spend approximately 10 minutes to complete the questionnaire. The questionnaire have two sections. First section is demography part and second section is a perception students in mathematics.

## **2.2 Measures**

The questionnaire was adopted from Radzali (1997). 40 items on perception students on mathematics. The items were ranked seven- point semantic scale; 1 = strongly agree to 7 = strongly disagree. This instrument has 5 latent constructs were interest, usefulness of mathematics, role of the teacher, peers and attitude related to the perception about learning mathematics among student

Pilot study were conducted to check reliability coefficient. The reliability was 0.927, indicating a high degree of internal consistency of the questionnaire.

## **2.3 Data Analysis**

This study applies SEM. SEM is a unique combination of factor analysis and multiple regression analysis (Hair, Anderson, Tatham, & Black, 2012). SEM can also be used to examine relationships among factors that allow the relationships to be free from measurement errors since errors have been estimated and removed, leaving only common variance. Finally, SEM appears to be the only technique capable of examining a set of relationships simultaneously when the phenomenon of interest is complex and multidimensional (Hair, Anderson, Tatham, & Black, 2012).

A group of goodness-of-fit indexes were used to determine the fit of the respective measurement models (variables), overall measurement model and the structural equation model in this study. These indexes include chi-squared/degree of freedom (Chisq/df), root mean square error of approximation (RMSEA), normed fit index (NFI), comparative fit index (CFI) and Tucker-Lewis index (TLI). In this study, a combination of all fit indices was used to assess a model.

## **3 Results**

The result showed RMSEA is 0.065, NFI is 0.865, TLI is 0.909, CFI is 0.917 and Chiq/df is 2.338. All the fitness indexes have improved after the model re-specification was made. All required levels are achieved. The tests suggest that the model is a good fit to the data.

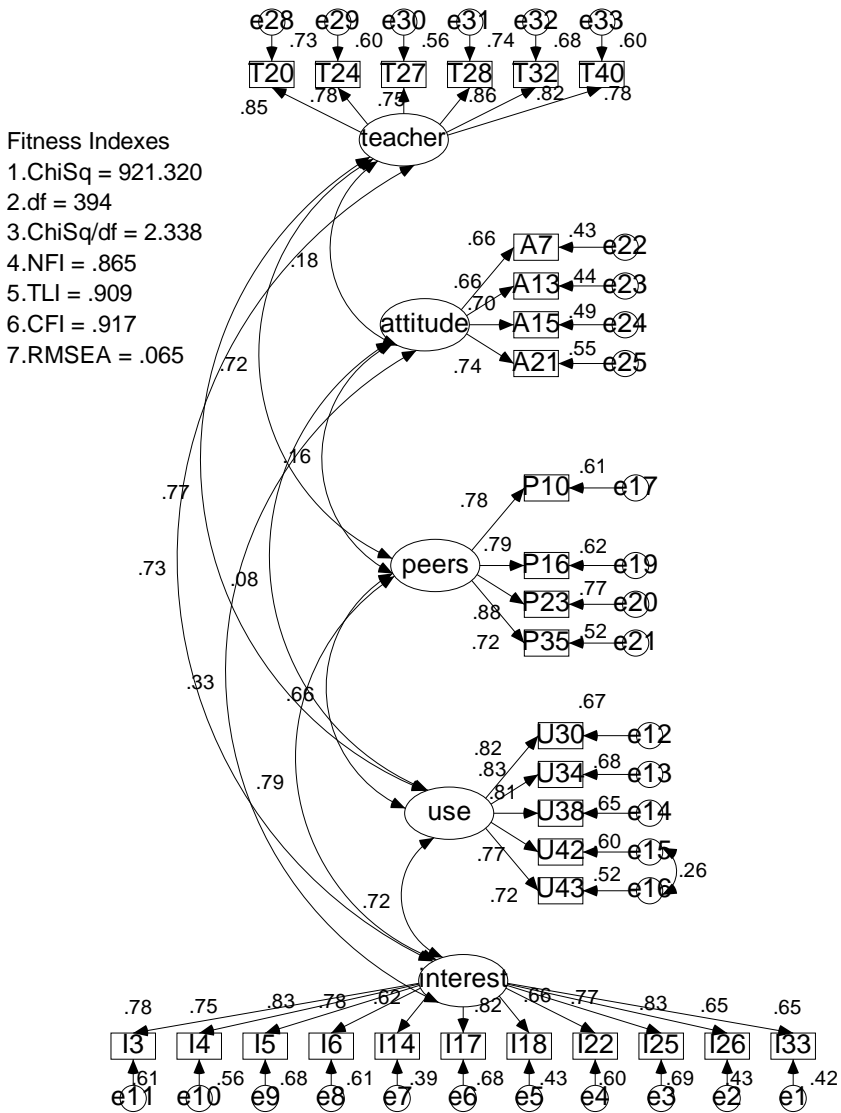


Fig. 1. SEM model analysis result.

Fig. 1 shows the measurement model of student perception on mathematics. This model indicated to the relation between latent construct. There are altogether four items from attitude, eleven items from interest, six items from role of teacher, four items from role of peers and five items from usefulness of

mathematics. Table 1 shows that there are several latent constructs are significant.

**Table 1.** Hypothesis and tested results.

Hypothesis	Content	Correlation
Teacher-peers	The covariance between role of teacher and attitude is significant different	0.719
Teacher-use	The covariance between role of teacher and usefulness of mathematics is significant different	0.769
Teacher-interest	The covariance between role of teacher and interest is significant different	0.727
Interest-attitude	The covariance between interest and attitude is significant different	0.330
Use-peers	The covariance between usefulness of mathematics and role of peers is significant different	0.658
Interest-peers	The covariance between interest and role of peers is significant different	0.787
Interest-use	The covariance between interest and usefulness of mathematics is significant different	0.717

## 4 Discussion

The aim of this study is to develop the model on perception students toward Business Mathematics course. The analysis indicated five latent constructs on students' perception in mathematics. This study could be used by teachers and peers of students. Teacher also contributes to student performance in mathematics. Teacher should introduce to student about usefulness of mathematics in the class to make sure them easy to understand the concept of mathematics and better in mathematics. Mathematics is crucial not only for success in university, but in being a knowledgeable citizen, being useful in one's chosen career, and in personal fulfillment.

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