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Selected Peer-Reviewed Articles from The 2016 International Conference on Data, Internet and Education Technologies (The DIET 2016)

It’s a great pleasure to present the Special Issue of The 2016 International Conference on Data, Internet and Education Technologies (The DIET 2016), that published in Advanced Science Letters (ISSN: 1936-6612 (Print); EISSN: 1936-7317 (Online)).

There are 119 papers that submitted in The DIET 2016, after rigorous review and editorial revision, only 46 papers were accepted for the Special Issue of The 2016 International Conference on Data, Internet and Education Technologies (The DIET 2016), that published in Advanced Science Letters (ISSN: 1936-6612 (Print); EISSN: 1936-7317 (Online)).

The theme of The DIET 2016 is Taming the Wild Frontiers of Data and Internet Technology.

Today’s Enterprises and Communities gather and store all kinds of data in hopes of one day extracting the information necessary for the next big breakthrough. But any insights gleaned should not exist in a vacuum. To succeed in this big data world, one must put these insights into use and operationalize
them—and that sometimes requires technologies that exist outside of traditional data center operations.

Getting the operational aspect correct is critical but often an overlooked component of having a successful big data strategy.

In the era of Internet Technology will generate huge traffic in global communication system, and can be slow down the communication performance in the next decade.

We would like to express our sincere gratitude to all in the Technical Program Committee who have reviewed the selected papers and give technical and/or editorial comments for those papers.

We do hope that this special issue will give positive impact to the Data, Internet and Education Technologies Societies.

Guest Editor

Ford Lumban Gaol
Bina Nusantara University

ABOUT THE GUEST EDITOR

Ford Lumban Gaol received the B.Sc. in Mathematics, Master of Computer Science, and the Doctor in Computer Science from the University of Indonesia, Indonesia in 1997, 2001 and 2009, respectively. He is currently Associate Professor Informatics Engineering and Information System, Bina Nusantara University www.binus.ac.id. He is the Chair of Ph.D. Program and Research Interest Group Leader “Advance System in Computational Intelligence and Knowledge Engineering” (InteSys) Bina Nusantara University. He was the co-founder of JIBES School of Computer and Informatics Management www.jibes.ac.id. Dr. Ford is the officer of IEEE Indonesia section for International and Professional Activities http://ieee.web.id/indonesia/officers/. He is the Chair SERSC: Science and Engineering Research Support soCiety Indonesia Section. http://www.sersc.org/organization.php

Dr. Ford was the ACM Indonesia Chapter Chair http://campus.acm.org/public/chapters/geo_listing/index.cfm?rabbr=Indonesia&inus=0&ct=Professional Dr. Ford involved with some project relate with Technology Alignment in some of multinational company like Astra, United Tractors, Telkom, Sony Erickson. For International collaboration, Dr. Ford is the recipient of IEEE Visiting Professor to Hong Kong University in 2011. For 2012, Dr. Ford already received confirmation form IAMSIE Hong Kong to collaborate with R&D with some Manufacturing Companies in Hong Kong.
KEYNOTE SPEAKERS

Tokuro Matsuo
Professor, Advanced Institute of Industrial Technology, Japan
Guest Professor, Bina Nusantara University, Indonesia
Project Professor, Nagoya Institute of Technology, Japan

Computational Method in Material Design
Artificial Intelligence (AI)-based search methods provide a lot of possibility to solve complex problem. However, except for logical reasoning, it cannot be used to analyze the detail of models because AI-based methods provide just roughly result through simulations. Traditionally, operation research (OR)-based methods may have a strong power to analyze more precise and concrete detail of local effects of systems. However, in a real world, a system sometimes has an uncertain temper like a cat. In material science and engineering, manufacturing of semiconductor is speeded up year by year because of competition with each implementing company. Thus, a lot of material scientists are annoyed with such actual situation to design new material of semiconductor. In this talk, I introduce our research contribution to the material design on adhesive design to find appropriate compositions. We employ multiple mixed-techniques including linear programming, nonlinear programming, reasoning methods, qualitative analysis and interpolation algorithm. Also, I show our developed software that is used in factories. It is used to find appropriate types of material, quantity of each material, and their combinations.

Yiyu Cai
Nanyang Technological University (NTU).

Virtual Reality: Research, Development and Applications
In March 2014, Facebook announced the USD$2 Billion acquisition of the Oculus Rift VR. In January 2015, Microsoft revealed its Augment Reality product HoloLens. 2016 is considered The Year of Virtual Reality (VR). VR, however, is not new. Back to the mid of 1960s, Ivan Sutherland, the inventor of the first VR Head Mounted Display (HMD), described “The screen is a window through which one sees a virtual world. The challenge is to make that world look real, act real, sound real, feel real.” In this talk, the keynote speaker will share the research and development of Virtual Reality at Nanyang Technological University, Singapore. In particular, fidelity modelling, real-time interaction, immersive visualization, and natural user interface will be detailed. This is followed by the presentation of VR applications in medicine, education, and engineering. Future direction of VR research and development will be discussed.
Iiyu Cai directs the Computer-aided Engineering Labs, and heads the Strategic Program of Virtual-Reality and Softcomputing with The School of Mechanical and Aerospace Engineering, Nanyang Technological University (NTU). He has over 20 years’ experience in VR research and applications development. His research has been supported by both government and public funding agencies. He has been keynote speaker and invited speaker for numerous international and regional conferences. He was the former Co-president of The International Simulation and Gaming Association. He teaches VR, Computer Graphics and Mechatronics in NTU.

Zhao Shengdong
National University of Singapore

Innovation Through Principles
Human-computer Interaction (HCI) is a very broad field without a single clear focus—there are a great number of HCI researchers from multiple disciplines working on a wide variety of problems that seem to have little connection with each other. However, a careful examination of these multiple approaches to problem solving seems to indicate that there are a number of distinctive, underlying design principles employed by researchers. In this talk, I try to describe three commonly seen design principles in HCI innovations, including “Enhance Directness, Facilitate Transition, Balance Humans and Computers,” and unpack these principles using projects from the NUS-HCI lab.

Shengdong Zhao is an Assistant Professor in the Department of Computer Science of the National University of Singapore where he founded the NUS-HCI research lab in 2009. He earned his Masters and Ph.D. degrees at the University of California at Berkeley and the University of Toronto, respectively. Shengdong has a wealth of experience in developing new interface tools and applications. ACM Interaction Magazine mentioned him as one of the most prolific authors in Asia for the ACM SIGCHI conference in the last six years. Shengdong frequently served on the program committees in top HCI conferences. He was a co-chair of the Interaction Using Specific Capabilities or Modalities subcommittee for SIGCHI in the last two years. Shengdong was also the recipient of the NUS Young Investigator Award.
Compound Critiquing for Conversational Recommender System Based on Functional Requirement

Yusza Reditya Murti∗, Z. K. A. Baizal, and Adiwijaya
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Today, it is not difficult to find new products with different functions and features. This condition puts consumers in doubt when they have to decide what product of which the specification and features meet their expectation. Conversational recommender system (CRS) helps users find the products that meet their criteria by using question and answer interaction. Conversational recommender system based on functional requirement may help users in stating their preference on the products they need. Critiquing technique is a mode of presenting questions that will help users in stating their preference. However, the form of critiquing unit sometimes causes the system not to be able to provide a single product that meets the user preference. Compound critiquing is a form of feedback developed from critiquing unit able to ensure the system in generating a product, thus the problem can be solved. In this paper, we proposed a novel approach combining conversational recommender system based on the functional requirement that uses feedback compound critiquing. Specifically, we develop interaction mechanism in CRS and generating compound critiquing method with considers the history-awareness and collaborative aspects in functional requirement perspective. The system developed ensures that the recommendation for a product will persistently be retained in each interaction section, so that the interaction between system and user will be more efficient. The study tests whether the approach built will persistently generate a product or not and whether the query refinement process runs well or not. The taken test that involves 150 random technical tests shows that 100% system can provide product recommendation in each interaction session.

Keywords: Compound Critiquing, Conversational Recommender System, Functional Requirement, Ontology, Recommender System.

1. INTRODUCTION

Along with the implementation of AEC (ASEAN Economic Community) in Indonesia, the number of products shared in market is also increasing. Products like cellular phone, digital camera and car have a complex and varied technical specification. Provided with the various products with a complex technical specification, consumers sometimes find difficulties in determining the products they want to buy. Furthermore, it is likely that people are getting busier that makes them have less time to consider products of which the specification and features meet their expectation. Therefore, a system that can help them choose the products commonly called as recommender system is required.

Recommender system is a system that can help and guide users in finding the products meeting their preference. Conversational recommender system (CRS) is one of the recommender system methods used in generating user preference by providing questions explicitly. CRS uses a repetitive question and answer interaction between the users and system called as cycle.1 In each interaction, users should provide some feedback that will further be used as a reference in recommending products intended by users.

Creating an effective feedback that can be used by users in stating their preference is one of the main problems in CRS field. Critiquing is a relatively effective form of feedback frequently used in CRS system. Critiquing feedback is comprised of two forms of critiquing including unit critiquing and compound critiquing. Unit critiquing has a problem, i.e., the system sometimes cannot recommend a product due to a contradiction between the user preference and the available products. Compound critiquing is the development of unit critiquing which is always able to recommend a product since the questions are generated from the available products.2

Many consumers are not familiar with the technical feature details of multi-functional and multi-feature products. Many of them choose the products based on the features which can help
them to do their tasks.\textsuperscript{3} It will be much easier for them to understand and state their needs in product functional requirement. Thus, the potential buyers or consumers who are not familiar with the product technical features will find that it is easier for them to state their preference in the form of product functional requirement. Research in CRS based on product functional requirement has currently been developed. Some of the developments are:

1. CRS that uses questions referred to product technical feature (technical feature)\textsuperscript{13,14} and
2. CRS that uses questions referring to product functional requirement.\textsuperscript{3}

The questions referring to the product functional needs to include need smartphone for Online Gaming, need notebook for HD Gaming while the technical features are, for instance, need smartphone with Chipset Mediatek Quadcore 1.2 GHZ Cortex-A7, notebook with Processor Intel Core-i7 Skylake 2.89 GHZ. The sample shows that the potential buyers or consumers who are not familiar with the product technical features will find that it is easier for them to state their preference in the form of product functional requirement. The approach in generating user preference recently developed can be categorized into two:

1. Dialogue-path which has previously been defined in the system (predefined),\textsuperscript{19,20} and
2. CRS based on functional requirement which makes interaction more dynamic for multi-domain with ontology-based Knowledge.\textsuperscript{3}

Based on the explanation above, CRS based on functional requirement is more helpful for users in terms of giving feedback, while compound critique can make interaction more efficient. Therefore, this paper will develop an interaction scheme using compound critique for CRS based on functional requirement. This study adopts ontology model in CRS based on functional requirement.\textsuperscript{3} The generation for compound critique in this study will adopt collaborative compound critiquing method from Xie and Pu\textsuperscript{15} which in generating compound critique considers history-awareness and collaborative aspects, where system will learn from the history data of the previous users. By using the method, it is expected that compound critique provided for the user will be more accurate and persistently generate a product in each interaction so that the interaction cycle between system and user will be more efficient.

### 3. PROPOSED INTERACTION SCHEME

In general, within the CRS framework developed in this study, there are three main process blocks as can be seen in Figure 1. The three processes are Dialogue Management, Recommendation Process and Product Recommendation and Explanation.\textsuperscript{3} The three process blocks are supported by two main components, i.e., user profile model used in saving user preference and ontology model used as knowledge base product. In general, dialogue management refers to the process block responsible for generating questions that will be given to the users as well as to build user profile model from the feedback given by the user. Recommendation process block is responsible for product retrieval in ontology model using SPARQL language.\textsuperscript{19,20} While product recommendation and explanation process block is responsible for choosing and weighting product as well as generating explanation to the user.
Approach for Unwrapping the Unstructured to Structured Data the Case of Classified Ads in HTML Format

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Data sources with various forms and formats available on the Internet. Data can be in the form of semi-structured and unstructured data. Research’s objective is developing approach for unwrapping the unstructured data available on the internet into structured data/database. Unstructured data used in this study is in the case of classified ads on the Indonesia website, and those unstructured data is in HTML format. The Illustration made to test the approach. The results of the test show the value of $f$-measure 99.13%.

Keywords: Classified Ads, Database, Internet, Unwrapping, Unstructured Data.

1. INTRODUCTION

Data can be obtained from various sources, one of which is the Internet that provide data with the various forms and formats. Data are presented on the website is designed to enable users and readers understand the data, but the data is may not necessarily well understood by the computer easily. One particular form of unstructured data is data on classified ads that are widely used in conducting the sale on the website in Indonesia. Website developers much more pay attention to how can display the data/information to the user/reader that easily understandable, regardless of how to make the data also understood by the computer.

The research’s objective in this article is to develop an approach to extract unstructured data into structured data using classified ads car sales as an example of unstructured data in HTML format. Many researchers can use terminology extraction, converter or unwrapped. In the example the classified is not known which data as a property, and instance.

Unstructured data is data that does not have a formal structure and it does not mean the data is not displayed neatly but may be a way how establishing data/coding of the data is done in a way that is difficult to be implemented by computer, such as plain text. Unstructured data extraction is done to facilitate the use of these data for further processing, so that the results of this extraction can be combined with the other data.

2. RELATED WORKS

Research conducting unstructured data extraction was undertaken by Ref. [3] with the using of unsupervised learning algorithm to look at the structure of the list. Extraction of data in the form of lists and notice the template used to identify the list in each web page. Then calculates the features extracted from each data, which further identifying columns and rows.

Other studies have also done by generating an application that called Lixto1 based on conversion from XML to HTML pages using a logical language called Ellog. Lixto provide two (2) options to perform data extraction mechanism that is tree extraction to identify each element of the HTML tags and strings extraction to include elements of the cell contents into the HTML tag that has been formed by trees.

Wei et al.6 developed a technique to extract tables from the available text. These texts of such as a query performed on table. Activities carried out such as changing text constitute unstructured data into structured data, despite the fact that these structured data has been provided in the form of tables and just straight taken away.

Currently there are many web sites are created using HTML, and the use HTML tags function to set the display on the browser. Data on the HTML hierarchy has two types, which are Syntactic Hierarchy and Hierarchy Intended.
3. METHOD

The form of unstructured data used in this study was classified advertisements. Classified ads contained on the website form of collection of data regarding a product/item being sold and the advertisements. Classified ads contained on the website form of tree used to represent and make the connection between objects of different documents into HTML web pages with the form of tree structure as a depiction.

Research this unstructured data; take the example of the data on the classified ads website made with HTML tag with respect to syntactic hierarchy.

Unstructured data extraction steps are shown in Figure 1. Extraction step of unstructured data into the database is as follows:

1. Pre Processing.
2. Retrieving data from a web site that contains a table that will be extracted. Taking process (grab) HTML tags using a tool, and with these grabs results of HTML tag, extraction process carried out.
3. Extracting the HTML tag to get the candidate table containing classified ads by defining (table) ... (table) tag and perform a search to determine the number of rows with the (tr) ... (tr) tag and the determination of the number of columns by (td) ... (td) tag.
4. Conducting the selection on the candidate table containing classified ads by matching words that exist in the database Keywords to find a table containing classified advertisements.
5. Matching data contained, after the table containing classified ads found, the next step is to match the data contained in the tables that contain classified ads with the tag word and data word.
6. Extracting results are stored in the database.

Preprocessing step is carried out in sequence illustrate as follows:

a. Define the HTML tags, that is (table) ... (table) tags.
b. Search for the word most often used as a keyword in the classified ads, and stored on a Keywords database.
c. Looking for a data word, that is any data related to the products/goods sold in the classifieds.
d. Looking tag word that often appears on the classifieds to distinguish the words found in these classified ads whether a part of the information about the products/items advertised.

The logic or algorithm to find table that contains advertising as follows:

1. If the first tag is found (html) tag, and in inside there is (table) ... (table) tag, table attraction can be executed.
2. If there is (table) nth tag, content of the tag is table candidate that has advertising (set nth start with value = 1).
3. Read tag (tr) in (table) ... (table) tag the value will be saved as number of candidate table.
4. Read (td) ... (td) tag to consider number of column/cell to save other data in (td) ... (td) tag.
5. Repeat step 4 until find (tr) tag, continue to read (td) ... (td) tag.
6. Repeat step 3 if not yet found tag (table), continue to read (tr) ... (tr) tag.
7. Repeat step 3 until found (html) ... (html) tag and continue to read (table) ... (table) tag.
8. After process extraction HTML tag finished, the number of (table) tag can be calculated as candidate table that consist advertising convert to structured data.

Algorithm 1 (Extract Table as Candidates Classified Ad).

Read HTML
TableQty = 0; RowQty = 0; ColQty = 0;
If read tag (table) then TableQty = TableQty + 1
Loop If;
For x = 1 to TableQty do
  Begin
    If read tag (tr) then RowQty = RowQty + 1
    Loop If;
    For y = 1 to RowQty do
      Begin
        If read tag (td) ... (td) then ColQty = ColQty + 1
        Loop if;
      End;
  End;
p = 1; q = 1; r = 1;
For p = 1 to TableQty
  For q = 1 to RowQty
    For r = 1 to ColQty
      TdVal(p, q, r) = value in tag { (td) }r
      Save TdVal(p, q, r) as element cell
      Next r;
    Next q;
  Next p;

Note:
1. TableQty: number of (table) tags used in HTML web site.
2. RowQty: the number of existing rows in a table.
3. ColQty: number of columns/existing cell of each row of a table.
4. TdVal: the value that is in the \(<td>\cdots</td>\) tag denote the data/elements of the cell.
5. \(p, q, r\): auxiliary variable for looping.

If the classifieds candidates table has been extracted, the next step is to determine which table contains classified ads by means of matching words with the Keywords database. Rules for detection table containing classified ads are: Perform Keyword database matching on each classifieds candidate table which are result of \(<table>\cdots</table>\) tag extraction.

If the number of words in the Keywords database that can be found in the classifieds candidate table amount equal to or greater than a threshold value (the number of words found \(\Rightarrow\) Threshold), it is said that these table is a table that contains classified ads, where the data is unstructured.

Formally, the determination of the number of words to define tables that contain classified ads is shown below:

\[
\text{Classified ads} = \{ \Sigma (\text{Keyword} \rightarrow \text{Table Candidate}) \Rightarrow \text{Thresholds}\}
\]

Algorithm 2 is used to define a table as a classified ad is as follows:

**Algorithm 2 Is Used to Define a Table as a Classified Ad**

\[\text{SimWordQty} = 0; \text{TH}\]

For \(p = 1\) to TableQty do

For \(q = 1\) to RowQty do

For \(r = 1\) to ColQty do

Read TdVal\((p, q, r)\)

While \(s = 1\) do

Read recKeyWord\((s)\)

If RecKeyWord\((s)\) = TdVal\((p, q, r)\) then

Begin

\[\text{SimWordQty} = \text{SimWordQty} + 1\]

If SimWordQty \(\Rightarrow\) TH then

\{"Table\}p is classified ad”

Else \(s = s + 1\);

End;

Else \(s = s + 1\);

Until \(s = 8\);

Next \(r\);

Next \(q\);

\{"Table\}p isn’t classified ad”

Next \(p\);

Note:

1. TableQty: number of \(<table>\) tags used in HTML websites.
2. RowQty: the number of existing rows in a table.
3. CokQty: existing number of columns of each row of a table.
4. TdVal: the value that is in the \(<td>\cdots</td>\) tag is the data/elements of the cell.
5. SimWordQty: the number of words in the database of keywords found in the tables extracted data.
6. RecKeyWord: keyword read from the keyword database.
7. \(p, q, r, s\): auxiliary variable for looping.

By using the Algorithm 2, a table containing classified ad has been discovered, the next step is to change the unstructured data into classifieds structured data/database. How that is done by using the tag word and data word. Tag word made in 2 (two) categories, that is: tag word differentiator word as part of the data on products/goods to the classified ads, and tag word differentiator word for ignoring strings/words after the tag word. The steps are as follows:

1. Match the tag word on the database containing classified advertisements.
2. If the tag word is not found and there is still a tag word being read, then read the next tag word, repeat step 1. If the tag word is not found and all of the tag word has been read, then do the second way/method by performing the matching of classified ads database with the data word.
3. If the tag word found in the classifieds database, grab the string that exist in the classifieds database after tag word as much as the value of the number maximum words that matched these tag word.
4. String as much as the number maximum words values taken after the tag word matched with the data word stored in the database corresponding with the tag word.
5. Save string matching results according to the data word which is found in structured data storage, and use flags to mark off the word in the next classifieds database that will be matched.
6. If still there tag word that has not been matched, then repeat step 1 for the next tag word.
7. If the all of the tag word matched is finished, then do the second way/method that is doing matching of classifieds database with the data word.

After performing the matching of tag word on classified ad database, the next step is to perform matching of data. In the matching process classified ads database with the data word per category, are also made to match the tag word which is said word differentiator to ignoring a number of strings/words after these tag word. Steps are as follows:

1. Data word per category matched on a database containing classified advertisements.
2. If not found and still no data word to be matched, and then move on to the next data word, repeat step 1.
3. If the data word that matched was found, then grab the string before the word that fits these data word. Number of string is taken as much as the threshold value.
4. Match these tag word with the number of string taken from step 3.
5. If the tag word is not found in number of string which taken, then save the word/string that are matched to database of structured data.
6. If you still have the data word per category which will be matched, then read the next data word, and repeat step 1.
7. If the tag word was found in number of string taken, then ignore the word of matching results with the data word.
8. If you still have data word per category which will be matched, then read the next data word, and repeat step 1.

### 4. RESULTS AND DISCUSSION

Based on approach of the extraction of unstructured data into structured data in this study, is made illustrations for the extraction of unstructured data, which is about the classified ad selling a car that is on the Indonesia website.

Figure 2 is an example of classified ads cars sales available on the Indonesia website.

Pre-processing stage in order to create a keywords database for detection the table on extract HTML tag is to do a survey on
30 web sites which provide classified ads and see what the word which widely used.

This survey is also obtained Thresholds for determining the value of a classified ad is equal to or greater than 4 (TH ⇒ 4). These results presented in Table I.

Then tag word is divided into 2 (two), that is word differentiator tag word as data about the car and the tag word as word differentiator to be ignored, and each tag word be given Maximum Value Word. Tag word is presented in Tables II and III.

If the tag word classified ad found in Table II then the string after these tag word is the data which will be stored as structured data/database in accordance with its name of the tag word.

Determination of the number of string after tag word which converted into structured data using number of the maximum word of each of these tag word, and then perform string matching with the data word. Tag word in Table III used when making changes unstructured data into structured data with the data word, as shown in Figure 5. Websites with HTML tags that contain classified ads extracted, and executed the Algorithm 1 and 2 to make changes to classified ads unstructured data into structured data car sales.

An illustration that conducted by comparing the classified ad with the tag word contained in Table I. On the particular web page was found that there is the word: “warna” means color in the classified ads, it is taken as the number of words after the word “warna” of a number minimum the word is 3 words: “merah orisinil total” means totally original red. These three words are matched with a database “warna,” and warna is obtained “merah” means red, so “merah” is stored in a database (structured data) as data contents of the color property (“warna”) database. After using the tag word, then executed a second way with the use the data word, which is matching word on the database four categories data of car, so that unstructured data is converted into structured data.

Illustration by comparing data word to the type of car category, which was found, is Honda. Then the word before Honda that is word sale is taken to be matched with the tag word to word differentiator is ignored. The result is not found, so the Honda is stored into the database as the storage of the data content property car type. The process of comparing Data word continued when there are other categories which have not been compared.

The approach in this study testing on 100 classified ads in Indonesian language contained in the 14 pages of the website. The algorithm is implemented in the PHP programming language. Testing was conducted to determine the ability of Algorithms 1 and 2 in determining classified ads candidates and determine classified ads by these candidates, and also to determine the ability in perform the extraction of unstructured data in

---

### Table I. Keywords database to detect table classified Ads.

<table>
<thead>
<tr>
<th>No.</th>
<th>Words</th>
<th>No.</th>
<th>Words</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jual/Dijual (sale)</td>
<td>5</td>
<td>Hub/Hubungi (contact)</td>
</tr>
<tr>
<td>2</td>
<td>Mobil (car)</td>
<td>6</td>
<td>Nego (negotiable)</td>
</tr>
<tr>
<td>3</td>
<td>Harga (price)</td>
<td>7</td>
<td>Tahun (year)</td>
</tr>
<tr>
<td>4</td>
<td>Warn (color)</td>
<td>8</td>
<td>Kondisi (condition)</td>
</tr>
</tbody>
</table>

### Table II. Tag word differentiator words as a data about cars.

<table>
<thead>
<tr>
<th>No.</th>
<th>Words</th>
<th>Number of the maximum words</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tahun/Thn/Th (year)</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Warn/Warna (color)</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>Tipe/Type (type)</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Harga/Hrg/Rp (price)</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>Merk/Merek (brand)</td>
<td>3</td>
</tr>
</tbody>
</table>

4. If found the word: “Tipe/Type,” means Type the next string is Data about the type of car being sold.
5. If found the word: “Merk/Merek,” means Brand the next string is data about brand cars sold.

Then rule on differentiator tag word says to ignore the string after the word tag is when found the word: “Kontak/Contact” means contact, “Hubung/Hubungi” means contact, and “Jalan/Jln/Jl” means street, then the next string not included in the car data.

Number of string after tag word which is been ignored as much as the number of minimum words. Data word prepared on preprocessing is divided into four (4) categories, which are: Category of car brands, Categories of car types, Category of car colors, Category of car year. Data word to category brand, type, color, and year of the car following the steps as shown in Figure 5 to make changes to classified ads unstructured data into structured data car sales.

---

### Table III. Tag word differentiator word to be ignored.

<table>
<thead>
<tr>
<th>No.</th>
<th>Words</th>
<th>Number of the maximum words</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hubung/Hubungi (contact)</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>Jalan/Jln/Jl (street)</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>Kontak/Contact (contact)</td>
<td>3</td>
</tr>
</tbody>
</table>
The Competency of Project Managers in Managing Agile Cost Management

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Agile cost management is seen interesting to be concerned due to enhancement of the development processes. By fixing the time, cost and requirements will help project managers to concentrate to the development processes. Therefore, the competent project manager is required to adopt with the new processes especially in managing the cost. By having certain set of competencies, the project managers able to avoid cost overrun and make sure the project will be delivered successfully. In general, the project manager competency includes providing the valuable knowledge, attitudes, skills and behavior that an individual needs to acquire to deliver superior performance. This paper aimed to investigate the competency level of project managers in managing a cost. The survey has been carried out in order to collect the data. The Rasch Measurement Model was used to analyze the data. The findings show most project managers were competent to manage cost effectively and efficiently in agile software development projects. However, the level of competent is differ based on their knowledge, attitudes, skills and behavior. In conclusion, level of competency can be categorized into competent and less competent. The categorization will help project managers themselves or the management level to test their competency toward managing cost in agile projects.

Keywords: Attitudes, Behavior, Person, Rasch Measurement Model, Skill.

1. INTRODUCTION

The conventional process model such as waterfall emphasizes on developing software systems through sequential phases with predefined documents, milestones and reviews after each phase.1 This has made the model more suitable for large projects. For small projects, it has been found that agile practices have lower costs, better productivity, better quality, and better business satisfaction.2 Therefore, most of the software development communities move towards adopting agile in their projects.

One of major concerned in agile projects is managing a cost. The uniqueness of managing cost in agile project is by fixing cost besides fixed time and requirements. This unique features are the enhancement of development process from the traditional method such as waterfall model. It increases the efficiency and effectiveness of software development communities especially project managers in managing a project. In addition, it also helps project managers more focus in determining cost pricing that lead to successful of cost management in agile project. However, the competency of project managers is still questionable whether they are competent enough to manage the cost in agile projects due to new processes and environment. Hence, the main objective of this research is to investigate the competency of project managers in managing agile cost management for software projects. Thus, this paper aimed to answer the research question which is How competent project managers in managing agile cost management for software project? The findings from this research seek to raise the competency level of project managers in managing agile cost management on the success of software project.

2. LITERATURE REVIEW

Agile software development requires alignment of decisions on the strategic, tactical, and operational levels requires a transition from specialized skills to the redundancy of functions and from rational to naturalistic decision-making.3–5 This takes time especially for early starters to change from traditional, hierarchical decision-making to shared decision-making in software development projects.6 There are many factors that influence the success of agile projects such customer satisfaction, customer collaboration, customer commitment, decision time, corporate culture, personal characteristics, societal culture, effective cost management and training and learning.6–8

Many representatives of agile development movements claim that agile ways of developing software are more fitting to what is actually needed in industrial software development.9
Communication and cooperation among the development team are considered to be fundamental and necessary in agile software development. Good communication and interaction within a development team can make the employees operate at a higher level compared to using their individual skills.\textsuperscript{10-12} It is believed that people who are sitting near each other with frequent and easy contact will develop software more easily.\textsuperscript{9} The idea behind agile projects people who work together increase work efficiency. Therefore, it is worth enhancing both individual competencies and collaborative skills.

In software projects the project manager is responsible of investigating and solving problems\textsuperscript{13} in order to ensure that the project runs successfully. For that purpose, they use a variety of processes, meetings, and documents. The project managers can extend his or her role to be a coach or facilitator. Moreover, the project managers need to keep the people continuously motivated and engaged with the project. Another competency of project manager is to be able to provide resource movement with a realistic transition plan which produce minimum impact on business. It has been stated that agile project managers is better than traditional project managers, as the former is able to keep an eye on the plan, let the plan evolve with time and accordingly take extra steps to manage the impact and change.\textsuperscript{14, 15}

The important part in the role of project managers is to take a step back from the details and to look at the big picture such as risk and cost estimates. This is to avoid constraints, which prevent project managers from meeting the deadlines and identifying the root cause of the problem. In other words, project managers are the keepers of the process. They track whatever the process is and responsible for making sure that it executes well. They are the one who make sure that the process is followed according to plan so that better results are achieved.

3. METHODOLOGY

The study was in a form of an online survey, which was set up by using google docs. The questionnaires for the survey were constructed based on eleven dimensions that has been identified in previous work.\textsuperscript{14} The survey was randomly disseminated among organizations that were involved in software development projects. There were 50 respondents responded to the survey. However, only 32 responses were complete and thus considered in the analysis. The Rash Measurement Model was used to analyze the findings.

4. THE FINDINGS

The questionnaires were distributed to 200 Project Managers in Klang Valley, Malaysia. The samples from Klang Valley can represent the population because most of large scale and multinational software development companies are located in the region. Out of 200, 50 responses were received. This makes the response rate to be 25%. However, only 32 (N = 32) were considered in the analysis. The rest of the responses were not fit because the respondents did not adopt agile practices. In general, it took 4 months to receive feedback from the respondents. The respondent’s demographic information findings are shown in Table I.

Table I presents the demographic characteristics of the respondents. Among 32 respondents, 24 (75%) respondents are male and 8 (25%) are female. It can be concluded that male is the most dominant gender that holds project manager post, as compared to female. Most of the respondents are among the 31–45 years old. It shows that to behold the project manager post, it needs several years of experience. In terms of education background level, 20 (63%) respondents have a bachelor’s degree. Besides, two (6%) diploma level, eight (25%) with master degree and two (6%) professional qualifications (other than PMP). In terms of working experience, eight (25%) respondents have less than five years’ experience. While nineteen (59%) respondents have 5–10 years’ experience and five (16%) respondents with more than ten years’ experience. Majority respondents were working in private sectors. The tabulation of business nature shows that most respondents worked in the software industry.

As shown is Table II, the Conbach-\(\alpha\) value is 0.90 which is considered as good reliability that allows for 90% confidence level or error free margin. This indicates that the instrument is reliable in measuring the cost management model in agile software development project. The results show high reliability for both person and item, which are 0.91 and 0.87 respectively. This is deemed “Excellent” reliability,\textsuperscript{19} That means it discriminates the respondents’ ability from difficulty of tasks.

The Mean\(_{\text{Item}}\) is at 0.0 logit and the Mean\(_{\text{Person}}\) is observed at 1.00 logit. In general, the respondents are above the Mean\(_{\text{Person}}\). This indicates that most respondents have good ability to agree and endorsed the items (questions in questionnaire). In other words, the respondents are very familiar with the items and practice agile cost management processes. It can be concluded that the respondents are competent to accomplish the item. Therefore, it can be justified that the items are widely practiced in agile cost management. Calculating the average probability of the person’s ability when Mean\(_{\text{Item}}\) is at 0.0 logit and the Mean\(_{\text{Person}}\) at 1.00 logit, and substituting the measurement into Rasch formula of probability yields \(P(\theta) = 0.731\). This indicates that on average
Table II. Summary statistics.

<table>
<thead>
<tr>
<th></th>
<th>Total score</th>
<th>Count</th>
<th>Measure</th>
<th>Model error</th>
<th>Infit</th>
<th>Outfit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>MNSQ</td>
<td>ZSTD</td>
</tr>
<tr>
<td><strong>Summary of 32 measured person</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Mean</td>
<td>227.7</td>
<td>60.0</td>
<td>1.00</td>
<td>0.15</td>
<td>0.99</td>
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<td>S.D.</td>
<td>21.6</td>
<td>0.0</td>
<td>0.53</td>
<td>0.02</td>
<td>0.22</td>
<td>1.2</td>
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<tr>
<td>Max.</td>
<td>278.0</td>
<td>60.0</td>
<td>2.56</td>
<td>0.24</td>
<td>1.65</td>
<td>3.0</td>
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<tr>
<td>Min.</td>
<td>182.0</td>
<td>60.0</td>
<td>0.08</td>
<td>0.13</td>
<td>0.72</td>
<td>−1.8</td>
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<td>Real RMSE</td>
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<tr>
<td>True SD</td>
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<td></td>
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<td></td>
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</tr>
<tr>
<td>Separation</td>
<td>3.17</td>
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<tr>
<td>Person reliability</td>
<td>0.91</td>
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</tr>
<tr>
<td>Model RMSE</td>
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<td></td>
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</tr>
<tr>
<td>True SD</td>
<td>0.51</td>
<td></td>
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<tr>
<td>Separation</td>
<td>3.31</td>
<td></td>
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<tr>
<td>Person reliability</td>
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<tr>
<td>S.E. of person mean</td>
<td>0.10</td>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th></th>
<th>Total score</th>
<th>Count</th>
<th>Measure</th>
<th>Model error</th>
<th>Infit</th>
<th>Outfit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>MNSQ</td>
<td>ZSTD</td>
</tr>
<tr>
<td><strong>Summary of 60 measured item</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Mean</td>
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<td>0.00</td>
<td>0.21</td>
<td>1.00</td>
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<td>S.D.</td>
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<td>0.62</td>
<td>0.03</td>
<td>0.38</td>
<td>1.7</td>
</tr>
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<td>Max.</td>
<td>152.0</td>
<td>32.0</td>
<td>1.81</td>
<td>0.38</td>
<td>1.82</td>
<td>3.2</td>
</tr>
<tr>
<td>Min.</td>
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<td>−1.97</td>
<td>0.18</td>
<td>0.13</td>
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<td>Real RMSE</td>
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<tr>
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<tr>
<td>Person reliability</td>
<td>0.87</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Model RMSE</td>
<td>0.21</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>True SD</td>
<td>0.59</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Separation</td>
<td>2.76</td>
<td></td>
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</tr>
<tr>
<td>Person reliability</td>
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<td></td>
</tr>
<tr>
<td>S.E. of person mean</td>
<td>0.08</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: aPerson RAW SCORE-TO-MEASURE CORRELATION = .98, CORNIBACH ALPHA (KR-20) Person RAW SCORE TEST RELIABILITY = .90; bUMEAN = .0000 USCALE = 1.0000, Item RAW SCORE-TO-MEASURE CORRELATION = −0.90, 1902 DATA POINTS. LOG-LIKELIHOOD CHI-SQUARE: 4520.99 with 1826 d.f. p = .0000 Global Root-Mean-Square Residual (excluding extreme scores): 0.8665.

at 73.1%, the respondents are competent to achieve the items successfully.

Figure 1 shows that all the tasks located below the Mean are at 0.0 logit and thus, are considered common and achievable to the respondents. The difference between PersonMax (2.56 logit) and PersonMin (0.08 logit) is 2.48, over a standard deviation (SD) of 0.53. This implies a small spread of person being on target of the expected competency.

![Fig. 1. Item-person maps.](image-url)
The difference between Item_max (1.81 logit) and Item_min (−1.97) is 3.78, which yields a large gap, over the standard deviation of 0.62. This shows a large spread of item where some items are off target. The off target items are those tasks without their corresponding person. In this case, those that fall below Person_min. The tabulated responses are sorted according to the ordered data matrix to reveal the patterns. The responses are sorted according to the total raw score for each frequency of responses by the respondents and by each question. Figure 1 shows that M23251 stands as the most competent respondent compared to M24322 which is the lowest respondents in the matrix. Both scores for item and person used 5-Likert scales (rating). Thus, the respondents’ responses were in the form of ordinal data. An ordinal data can only determine the median of the halfway point of the data set. This study however employed zero point for the Mean as a base of measuring the ability of a person and task on the equal interval measurement scale. Therefore, the study applied Rasch Measurement Model in order to transform the ordinal data provided by the respondents into interval scale. This enables the correlation between the person and the attributes on the same linear scale called log odd unit or commonly used as logit can be plotted on the Wright person-item distribution map (P IDM) as in Figure 1.

There are 48.33% (n = 29/60) tasks that are located below Mean_item. This indicates that the items are easy to achieve by the respondents. In other words, the easy tasks were practised by the respondents in agile cost management processes. Therefore, the determinants are strongly contributing to the success of the agile cost management process.

In general, the respondents are competent in performing agile cost management processes as shown in Figure 1 since they are located above Mean_item = 0.0. It can be concluded that the respondents in this study have no difficulty in achieving the prescribed tasks. The most competent respondent in this study is 27M23251 located at 2.56 logit. However, there are another two persons who can be considered as the most competent respondents which are 27M23251 and 11M23221 with locations at 2.25 and 1.97 logit respectively. These three respondents are very competent in practising agile cost management processes. They were observed as being able to perform the given tasks. The less competent respondent is 25M14122 located at 0.08 logit. Meanwhile, there are tasks which fall above the Mean_person and are considered as difficult according to the individual level of ability. There are 51.67% (n = 31/60) tasks which fall under this category.

5. DISCUSSION

Figure 1 reveals that the respondents can be categorized into two groups which are Competent group and Less Competent group. The respondents who categorized under Competent groups is those respondents who located above the Mean_person = 1.0 logit. While, Less Competent groups consist of respondents who located under the Mean_person. In terms of the percentage, Competent groups represent 44%, (n = 14) and Less Competent represent 66%, (n = 18) of 32 respondents. Separation of gender in each group shows that out of 44% in Competent group, 93% are male (n = 13/14) and only 7% are female (n = 1/14). Whilst, in Less Competent groups, out of 66%, 67% (n = 12/14) are male and 33% are female (n = 6/18).

The most competent respondent is person 27M23251 located at 2.56 logit whom is a male, with age group between 31–45 years old with bachelor degree qualification, has worked for 5–10 years in private software industry. From Figure 4.2, it shows that 3 respondents who has free item which are person 27M23251 located at 2.56 logit, person 11M23221 at 2.25 logit and person 12M23256 with 1.97 logit. Person free item indicates that these 3 respondents have high ability to achieve all given tasks. They think that all given tasks are easy for them and in the future they will need more difficult tasks to be measured. In terms of competency, they can be concluded as high competency respondents. In other words, they are commonly practiced the entire dimension measured in agile cost management processes. It can be justified that these three respondents have enough experiences in performing the cost management processes in an agile software development project.

The less competent of respondent is 25M14122 located at 0.08 logit whom is a male with age group between 21–30 years old with a postgraduate qualification, has worked less than 5 years in International gas and oil company. This reflects the true ability and characteristics of the respondent who is considered new in hold project manager position and less experience in performing cost management processes in an agile software development project. The observation between the different group of age and experience showed that mature or eldest male respondents with experience more than 5 years are good practitioners and can perform cost management processes well compared to younger male respondents who has little experiences which is less than 5 years and group age between 21–30 years old. However, for female respondents, they can perform well the cost management process even thought they were still young and has less than 5 years’ experience. This is due to the basic behaviors of female which is they are better in managing or spending their money compare to young male who are not good in managing their money.

6. CONCLUSION

In conclusion, most of the project managers in this study were competent to manage cost effectively and efficiently in agile software development projects. However, the level of competent is differ based on their knowledge, attitudes, skills and behaviour that can be categorized in Competent and Less Competent. Even though, they are competent project managers but in terms of level practicing seems different due to ability to manage the cost. The categorization will help project managers themselves or the management level to test their competency toward managing cost in agile projects.

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References and Notes


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Violence Against Children in School Learning Process in Aceh

Mujiburrahman

Observing a great deal of violence against children that occurs in educational institutions has made us realize that, in fact, the violence experienced by children has already been greatly widespread. Not only in the household and in the community, but the violence has also been found in a number of educational institutions in Aceh. Educational institutions are supposed to guide students to have good personal behavior, mindset, and character. Yet, in reality, the violence occurred within educational institutions has tarnished the spirit and purpose of the education itself. It has even distanced the students from the expected educational goals. Based on these problems, the study was focused to address several issues on: the factors causing violence against children in schools, the types of violence against children in schools, and the strategies and efforts of the Government of Aceh and the school to address the issue of violence in the school environment. This study was a field study using the combination of qualitative and quantitative methods. The sample consisted of 21 public/Islamic elementary schools (SD/MI), public/Islamic junior high schools (SMP/MTs), public/Islamic senior high schools (SMA/MA), and integrated boarding schools in Aceh. Data were obtained through focus group discussions (FGD), in-depth interviews, and questionnaires. The respondents included students, parents, teachers, police, community leaders, religious leaders, NGOs, and academics. Findings showed that a number of factors have caused the violence acts, among others: Schools had no standard operational and procedures (SOP) in handling problematic children, there was a mindset among teachers that the use of violence was still an effective method in educating the students, conflict issue has also influenced the way to educate children, both by the teachers and the parents, and also the violence legacy (culture of violence) in educational institutions. Generally, the forms of violence in educational institutions in Aceh which often happened and were experienced by the children (students) were more dominant on the aspect of physical abuse compared to the psychological abuse and sexual abuse. The emergence of various forms of violence to children (students) in schools has received serious attention from the Government of Aceh, the government of district/city and the school itself. A number of policies, regulations and programs have been formulated by the government to anticipate and prevent such violence. The schools have also established mechanisms and procedures for handling the children, improved the management and governance of the schools in order to create shared responsibility in taking care the children, publicized and socialized the school rules to the children and their parents as well as the society.

Keywords: Parental Involvement, Chinese Primary Schools.

1. INTRODUCTION

Violence against children is not only a social reality in our society, but it also penetrates into educational institutions. The main purpose of the educational institutions is to guide students to change their behavior, mindset, and character into a better one. An educational environment which has been tainted with various forms of violence will further alienate the students from the expected educational goals.

Although there are a large number of laws that provide advocacy and protection to the children, various forms of violence have, in fact, become a reality with the ever increasing cases over time. Child Protection Commission (KPA) reported that violence against children, in general, has increased from 2007 to 2008. During 2008, the child rights violation cases amounted to 26,901,627, consisting of physical, psychological, and sexual abuses, as well as minor employment. In 2008, the child rights violations observed have been increasingly worrisome and extremely complex. In addition, in the education world, the data released by UNICEF in 2006 showed that approximately 80% of violence occurred in children was actually committed by the teachers.

In Aceh, cases of violence against children in the school environment were found as many as 1,050 cases in SDs in four districts of Bireuen, South Aceh, Aceh Jaya, and Bener Meriah. Mathematically, it can be said that every child in Aceh experienced 3–4 types of violence. The types of violence included, for example, hitting with hands, hitting with a tool, slapping, pinching, kicking, rebuked, scolded, and so forth (Ref. [9], p. 109).
Fun Learning Effect Towards Readiness of Learning Among Preschoolers

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This study aims to identify about the fun learning in the preschool's context, the executed activities and the impact to learning readiness among children in a preschool. The research design is case study of a place and multiple cases. A teacher, a student management assistant and 25 pupils are selected as respondents in this study. The data obtained through qualitative namely interviews, structured observations and document analysis. Overall the data was analysed manually by researchers and themes produced were revised and endorsed by the main supervisor. The results of this study found that the approach through play is the main approach in creating fun learning in preschool. Besides, the interesting set induction process such as magic game, attractive usage of teaching aid, motivation and teacher including peers’ roles in an activity can create fun learning experiences in preschool. In conclusion, learning through play successfully produce meaningful and joyous process of learning as well as assist in changes towards children readiness to learn in preschool. The result shows that fun learning in preschool. The results show that fun learning in preschool classes in creating children's readiness to learn is connected through four elements namely teacher's understanding, implementation of activities, the use of teaching aid and teachers’ natures in strengthen fun teaching and learning in preschool classes. The teacher's understanding on fun learning gives impact on the students' readiness to learn in preschool classes which in line with the requirements of the National Standard Curriculum for Preschool.

Keywords: Fun Learning, Readiness, Preschools, Case Study, Play.

1. INTRODUCTION

Preschool education is the foundation in influencing the children’s development of learning in the future. Children who attend preschool education showed positive response toward cognitive and effective’s development at primary and secondary education levels. This preschool experience and effective, meaningful and fun learning can supply skilled, confident, positive attitude children in entering the formal school and life long learning process. The Malaysia government provides special attention to the current Preschool education. In the National Key Result Areas (NKRA) education, the government give prior thought to 4 sub–NKRA to widen the access of quality and affordable education which include preschool.

Children learn and acquire apt experiences based on their surroundings. In order to face future obstacles, children need to enrich with variety of experiences and intelligence according to the culture. Preschool experiences and effective, meaningful and fun learning adequate them with skills, confident and positive attitude as preparation to enter formal schooling and life long learning (Gardner, 1983 in Kamaruddin Yaakob 7).

1.1. Fun Learning

Fun learning is a teaching technique that uses a variety of teaching aids in the teaching and learning process emphasized in the preschool classes. The effectiveness of an approach or method is interconnected between the teachers’ efficiency and children’s needs. Optimal and balanced growth start from exciting curriculum that is operated in a joyful environment. The most effective learning is something that happens in a delight situation (Piaget and Forbel in Panduan Kurikulum Prasekolah, 2003). Thus, a study of fun learning in the context of childhood education is necessary for creating learning readiness among preschoolers.

The application of fun learning in preschool education requires adults as responsible individuals in children’s life learning. One of the most important roles is to establish a loving learning environment that stimulates the mind as well as a child’s physical (Forbel, 1889; dalam Azizah Lebai Nordin, 2002). Therefore, it is important for preschool teachers to use skills that can help children in creating a fun learning environment in preschool classes. This study focuses on the understanding and practice of teaching and learning implementation through a variety of elements that can create fun learning by preschool teacher.

Although there are variety of approaches in fun educational learning in preschool education, a large part of the school or
teachers does not emphasize it. Pressure from various parties to see children read in a short of time lead teachers to ignore fun learning and focus solely on oriented academic teaching. Consequently, many programs of early childhood education used drillings and ignore the fun activities in the early childhood education.11

Hence, the implementation of fun learning in preschool classes need to be refined as outlined by the National Standard Curriculum for Preschool (KSPK) to ensure children can learn in a stress-free environment. Learning is fun concept is very important in the early childhood education because the readiness of the students to learn at this stage is still vacant during their registration to preschool.16

2. THEORETICAL FRAMEWORK

The theoretical framework of the study was built to see some elements of relevance that form the basis of a vital part in helping to create the students readiness to learn fun learning-based in class. The framework is built based on Perlaziman Thorndike Behaviourist (1913) which is specifically shaped to be used in the research as shown in Figure 1.

Figure 1 shows the Behaviorist Learning based on Thorndike (Pelaziman Operand) in the classroom.1 According to Thorndike,1 this relationship is based on the numbers of training, condition of individual readiness and effectiveness of training.

With this description, Thorndike successfully formed three laws of learning which are Law of Readiness, Law of exercise and Law of Effect. Learning process occurs through activities. The students are ready in terms of cognitive and psychomotor to receive new learning.

According to Thorndike’s law of readiness, a child is ready to learn if the lesson trigger satisfaction and pleasure to him.5 According to Kamarudin,7 learning that cannot be forced within a target time and if it does, it will not produce something good and perfect.

Fun learning in the preschool program will be effective depending on teachers understanding in executing it. The main objective is to identify teacher’s understanding in creating students’ readiness through fun learning in preschool. The research conceptual framework built was a modification based on Thorndike Behaviourism. Researcher divides the purpose of study based on the dependent and independent variables which related to fun learning with students’ readiness. The dependent variable in this research is teacher’s understanding and teaching and learning activities.

3. RESEARCH CONCEPT

In the Fourth Edition Of Dewan Dictionary (2007), it defines fun as triggering sense of pleasure (joy, bliss). Meanwhile fun according to Abdul Rashid and Hasmah Ismail2 is to generate feeling of happiness and hilarious such as humor which amuses someone when listening to it. Referring to Noriati et al.14 play is the fun activity. Fun involves emotions. When an emotion sparks and excited, it leaves in depth impact towards the doer or an individual involved. Hence, the occurred learning will affect and remain indefinitely.

Learning readiness based on Bruner5 refers to matters that can be delivered to children in any stages of development. Meanwhile Piaget17 relates learning readiness with learning stages according to children’s cognitive developments namely sensory motor stage (0–2 years old), pre operational stage (2–6 years old), concrete operational stage (7–12 years old) and formal operational stage (after 12 years old). In the research, learning readiness is defined as an acceptance process of an individual to perform effective learning activities based on intellectual, psychomotor, emotional and maturity developments.

Based on the research’s suggestion, researcher hopes to identify fun learning in the context of preschool to produce learning readiness among preschoolers. In addition, the limitations faced by preschoolers in learning readiness specifically in the aspect of motivation to learn can be seen and resolve with multiple techniques and fun methods in preschool education.

4. RESEARCH LITERATURE

In Malaysia, research on early childhood is still new and limited compared to the Western countries. A lot of research focus on learning in high and primary schools and the taught subjects. Recently, research on fun learning emphasizes on learning readiness at preschool level is still lacking compared to other countries.

The National Preschool Standard Curriculum (KSPK) 2010 is the current curriculum which replaced the previous National Preschool Curriculum (KPK) 2003. KSPK is created to ensure holistic development of children based on Students Appropriate Act Development like Table 2.1. One of KSPK policies is for holistic development, effective learning, fun and meaningful learning and basic skills to life-long learning education (Unit Pengurusan Prestasi dan Pengurus KPM, 2009).

In this study, researcher chose to use The Thorndike Operant Behaviorist. The Thorndike Operant Behaviorist is proposed in 1991 by Edward L. Thorndike (1874–1949). This theory is also known as trial and error theory. In his experiment which used a cat had proven that animal and human can learn through process of trying named trial and error. The learning process proposed is connectionism. According to Thorndike (1994), the relationship or connection between stimulus and responses will be more firm
if the effect of behavior is fun and satisfying. The relationship is occurred based on the amount of exercises, individual’s readiness and the effectiveness of exercises.

The law of readiness explains about the willingness of someone to learn and vice versa. If the pupil is ready after a motivational boost then learning will be more effective. Hence, teacher has to ensure students’ readiness to begin a topic or an activity. Students will be the best in learning when it is appropriate for their capabilities.

5. RESEARCH METHODOLOGY

This study is a case study of one place and various cases (Yin, 1989 dalam Othman Lebar15). Various cases refer to one teacher, one student management assistant (PPM), and all pupils in a preschool class who provide data about fun learning in helping children’s readiness to learn, especially in Bahasa Malaysia language and literacy, while a only a school as research location.

This case study uses a qualitative approach using three methods of data collection, namely the interview as the main data and observation towards respondents as well as analytical methods will be implemented to support the document data interview. Field notes and check list are used to toughen all the data. The data collection through in depth interview is a main method for the research.

Alternatively, structured observations used in this study to support the interview data. Researchers have a focus on things that would like to be advised and prepared several checklist forms when observations are carried out by researchers. The research is carried out towards teacher and preschoolers while fun learning is performed which might used various approaches emphasized in the preschool education. Researcher also jots down field notes to look at children reactions after the completion of fun learning in producing learning readiness during the research.

This research is carried out in Sekolah Kebangsaan Tanjong Malim in the District of Batang Padang, Perak.

6. RESULTS

This chapter discusses on the results for each research’s questions which directly fulfill the needs of research’s objectives. This result is an outcome from data collection through interviews, observations, document analysis and checklist. The result is from qualitative data which is analyzed inductively and deductively.

The first question from the research is related to teacher’s understanding on fun learning in preschool context in generating learning readiness specifically in literacy or Reading in Bahasa Melayu Anchor. Researcher looks into how teacher applies form of teaching and fun learning (P&P) in class. The data touches on teaching and learning executed by preschool teacher in creating learning readiness through applied learning base don interviews, GP confession through interviews, field observation and document analysis. In order to answer this question, researcher prepared specific questions like in attachment C. Most data in the research questions is produced from interviews with GP and PPM as well as researcher’s observation while in the research field.

The fun P&P implementation in preschool class is based on GP’s creativity in P&P. The series of interviews and observations done by researcher in preschool class indicate several specific criteria in P&P implementation like stated in Table 4.17 at attachment M. There are five criteria representing GO in preschool class in creating fun learning which are joyful experiences, motivation and rewards, facilitate comprehension, attract interest and focus.

Criteria to a joyful experiences is the GP’s main characteristic. The results showed that GP is always able to create fun teaching and learning environment through interesting activities which are suitable with the current issues like stated in observation P1, P5, P7, P9, P10, P11 and P12. For instance, while observing P10 and P11, GP had created P&P like celebrating a Chinese New Year with mixture of activities such as magic, shows about the day, coloring a picture of the festive, creating angpau (envelope), Chinese dance and etc. (AD4. 2013). Children active involvement in this learning situation triggered fun experiences among children.

Discussion on this matter is to answer the second research’s question which is what the fun activities are in preschool class. In accomplishing the objective, researcher prepared a specific question in the interview’s protocol such in attachment C. This data is collected through interviews, observations and document analysis. The result is focusing on activities which were used during teaching and learning in Bahasa Malaysia Cord and only method in Bahasa Malaysia which had been explained in Chapter 1.

Based on the research’s result, most fun learning activities in Gp’s preschool class are assisted with game and movements as well as songs. Besides that, visual education also fun learning activities for preschoolers. The result is explained through GP words “For examples, singing activity, movements with the students, drawing, coloring, art works and so on” (TGP: B20). These preschool class activities can please children’s hearts while learning in the class. This view is also similar to Nor Hashimah and Yahya (2007) that all children senses are directly involved in multiple learning situations which stimulate indoor or outdoor learning process.

Preschoolers are exposed to fun learning in Bahasa Malaysia Cord assisted with variety of games with certain songs to boost excitement and pleasure of playing in order to generate preschoolers’ learning readiness in class. Creative GP in planning activity with multiple learning techniques according children’s capabilities to ensure fun while learning.

The result indicates that fun activity for children can be carried out in two conditions which are in solo and group. This is explained by GP “There are two common fun activities which are in solo, and the second is activity in group. The solo activity done aaa like making collage, making an activity, I used to do an activity to create a kite, aa wáter game activity, aaa and group activity, puzzle, combined puzzle aaa, and card activity to be a sentence” (TGP: B68). This concludes that fun activities have been mentioned.

7. DISCUSSION AND SUGGESTIONS

In brief, all data resulted to learning readiness specifically in children literacy and Reading are from four themes which are interconnected namely teacher’s understanding on definition, theory and approaches, implementation of teaching and learning (P&P), a habit of using teaching aids and activities conducted. The four elements are connected in producing learning readiness among preschoolers especially in changing children’s behaviors.
The Effectiveness Usage of Mind Map in Form Five’s Academic Performance in History

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This study was conducted to evaluate the effectiveness of using mind map on the academic achievement of students in history at one of the secondary schools in Miri, Sarawak. This quasi experimental study is performed on form five secondary school students. A total of 52 students served as research samples. Through three weeks of teaching and learning sessions, form five students in experimental group are taught using mind map while form five in control group are taught using conventional approach. The data was obtained from the pre-test and post-test. Data analysis was performed using \( t \)-test or in specific is Independent \( t \)-test between different samples and Paired \( t \)-tests for test analysis on the same samples. Findings showed that sample for pre-test between the experimental and control group are the same or in other words, initially, the students had same test data related to the level of history knowledge. \( T \) value recorded is 1.568 which is lower than the critical value 1.96, \( \alpha = 0.05 \). Meanwhile the post test analysis for both groups can proved the difference between the sample mean value with \( t \) value recorded is 5.852, larger than critical value 1.96, \( \alpha = 0.05 \) so \( H_0 \) is rejected or in other words; mean is the same. In the subsequent analysis, Paired \( t \)-test was used to analyze the pre and post test scores of the groups. Both groups recorded a significant improvement with an increment in the experimental group with \( t \) value, 17.065 exceeds the critical value of 19.6 along with the mean difference between pre and post 22.133, \( \alpha = 0.05 \). Data improvement of experimental group is more apparent compared to the control group which did not adopt the learning mind map. The findings of this study demonstrated that the use of mind maps in teaching and learning successfully increase form five student’s academic performances in History lesson.

**Keywords:** Effectiveness, Mind Map, Academic Performance, Teaching and Learning, Quasi Experimental, \( T \)-Test.

1. **INTRODUCTION**

History is the core subject for secondary school students in the Integrated Curriculum for Secondary Schools (KBSM) (Ministry of education 1990). The implementation of KBSM changed the demand of History. History has become a compulsory on going subject to be learnt by all secondary students from form one until five.

Facts have to do with concept because fact is the information or data that help to shape, build and develop a concept. Since learning using a concept is an important division of thought, hence the emphasis on teaching techniques that enable students to master concepts of History is essential to be done by History teachers. Thus, the use of mind map in the teaching and learning process of history is a very appropriate teaching technique. The use of a mind map will help students to be more focused, able to interpret and to understand the topics easier. Aligning with Abdul Rahim, that the use of concept map could facilitate student’s thinking, helps to strengthen memory and students are able to memorize important fact which later can be well explained by them.

The applied strategy in teaching and learning is to use the mind map technique. According to Buzan (2003), man can easily remembered interesting stuff that can be seen and written or simple picture that contains information which can be stored in the human’s mind. This proves that beside understanding of what has been revised, the process of memorization also important for students to recall previous knowledge. Therefore, in facilitating knowledge as well as to attract and manipulate both brain, mind map learning method introduced by Tony Buzan is one of teaching methods that can be applied in modular.

2. **RESEARCH LITERATURE**

The goal of History for lower and higher secondary is to inculcate the spirit of allegiance to the nation and the country and proud to be Malaysian. The content is provided with a curriculum focused on giving a thorough understanding about the history of the country that covers a span of five hundred years and is done in chronological order of years.
History teaching and learning should focus on the knowledge, skills developments and fostering the 5 values. History is placed based on this explanation; “History is the core subject which is compulsory to be learnt by all secondary students.” Students in this globalization era need to be exposed with in depth understanding about the country and society developments. The thorough awareness about history is important as today, our country has been through mixture of obstacles and victory and through the subject of History, we can produce gratification and Malaysian identity (Abdul Shukor, 1998). Hence, History plays a crucial role in providing an emphasis of continuation and changes that happened towards the nation and country.

Novak and Gowin (1984) prove that meaningful learning can be done with strategic cognitive teaching and learning through the application of mind map. The effort in Cornell University to study on the strategic teaching and learning helps to expand the ability to process information and integrating new knowledge. The achievement of using mind map as a cognitive strategy had proven to boost up the ability to think better compared to the previous learning strategy.

Gagne (1996) indicates that the usage of mind map is a cognitive strategy which is easy to be employed. Students will learn the materials taught quickly when teaching is made in the form of group by using the sketch of a picture or structured words. Students will also use the intellectual skills to solve problems that are given based on the subjects taught. Students who have problems will choose the easiest solution to understand the contents that represent the whole topic with peers or teachers’ assistance.

The use of thinking tools such as the conceptual mind map can help students to strengthen memory and comprehension of History easily. Students are encouraged by the teacher to use mind map in the learning.

This is in line with Abdul Rahim (1999) and Buzan (1984) indicate that in improving memory, reasoning and developing thoughts in a learning; mind mapping concept is highly recommended.

### 3. METHODOLOGY

This research design uses the method of quasi experimental. In the design of quasi experiments; there are two variables studied which are dependent and independent variables. Dependent variable is the History academic achievement while independent variables are teaching using mind map and conventional method.

Research’s samples is 52 students. Students are divided into two groups of 22 students for Group A called a control group and 30 students for Group B named experimental group. Pilot tests are administered to 10 students in the school to determine the reliability of the research study. Student in Group A and Group B will sit for the pre-test to determine the level of students’ existing knowledge in history. Then for Group A, the students will be taught using conventional methods while for Group B, the students will be taught using a mind map. Then, post test is given to both groups to see the effectiveness of using mind map towards academic achievement.

Besides independent variable and independent variables, there are external variables that may interfere with the results of the study such as the sample selection method, the research’s duration and preparation of questions. In order to control these external variables, some precautions steps are taken into consideration.

Among of the samples consist two groups of students who are at the same level of achievement in History. In addition, the mean pre-test for both groups will be analyzed to ensure inexistence of significant differences in terms of ability or achievement in History before the study is carried out.

In the research, teaching preparation and test questions that used in pre and post tests are the research’s instrument. Pre test is given before the teaching and learning process to evaluate students’ accomodated knowledge. Meanwhile, the post test is given after the teaching and learning process to measure students’ understandings as well as the effectiveness of mind map in History academic achievement. A total of 52 students from a secondary school in Miri, Sarawak are the research’ samples. The samples are 17 years old whom are seated for SPM in 2014. These samples are 5 students from two different classes at a school located in Miri. These samples are divided in control group (22 students) and experimental group (30 students) according to the chosen classes. As this is a quasi experimental research, only samples in the existing class provided by the school are involved in the study.

The pilot study carried out to 10 students was to identify the question’s level of difficulty and the exact questions to be understand by students before the real test and also for the reliability. The reliability indicated a consistent individual’s score through a set if item to another set. Cronbach Alpha is used to set the reliability in the items. The reliability of an item depends on the value gained. Coefficient Alpha is more than 0.65. In the reliability analysis for both test, the value gained is more that 0.65 which is 0.6512 for pre test and 0.6902 for post test like in the Table I. This shows that the reliability for items can be accepted to be distributed to students for research’s purpose. A total of 17 items are used; 15 objective for Section A and 2 structured question for Section B.

To ensure the validity of pre and post tests, researcher constructs items based on the Taxonomy of Bloom. In order to enhance the validity for the test questions, researcher also refers to the Head of History Panel and two History teachers with more than

<table>
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<th>N</th>
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<th>Reliability</th>
<th>Alpha value</th>
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<tbody>
<tr>
<td>17</td>
<td>Pre test</td>
<td>0.6522</td>
<td>0.6512</td>
</tr>
<tr>
<td>17</td>
<td>Post test</td>
<td>0.6902</td>
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**Table I. Alpha value in reliability test.**

![Research's flow chart.](image)
10 years of experiences in the school. Based on the teachers’ reviews, researcher amends and replaces question items that are insuitable before distributing them to the samples.

The Pre and Post Tests are reviewed based on the marks achieved by both groups. The data is collected and analyzed by SPSS version 20. The research will be analyzed descriptively and inferentially. In order to test and figure out the test data is normal, the skewness value is used. The positive value shows data skewness towards positive or the right Histogram’s figure, while negative indicate skewness towards negative or left. Histogram portray an overview of data scattered shows skewness and preferably an overview of balanced right and left bell shape right and left shows that the data scattered normally. Values or ranges that are considered normal scattered data is range from −1 to 1. If the data in abnormal event, then the data must go through the transformation process as a log transformation, square root, reciprocal and others that coincide with the data. This should be confirmed as a precedent to use parametric statistical analysis.

In the inferential analysis, T test used for data using the scale interval and ratio scale. These tests are needed to find out whether there is a difference of achievement between the control group and experimental group in a test post and also to find out if there are significant differences to the existing knowledge of the students in the control group and experimental group on History.

The T test used is “Paired-Samples T Test” for the same samples and “Independent-Samples t-test” for comparison of different samples. Critical values of t is 1.96. If the value of t is greater than the critical t value then the null hypothesis will be rejected. Information through charts and graphs pie infused to strengthen findings.

4. RESEARCH RESULT AND DISCUSSION

The research discussion touches on the effectiveness of teaching and learning process. History using the mind map is focused on the data gained through Pre-Test and Post-Test which was seated by the research samples. The discussion also concentrates on how teaching and learning using the mind map can help to assist students in enhancing their achievement in History.

T test for the control group and experimental group, Pre-test scores from the experimental and control groups was indifferently significant from the mean or average. This highlighting the samples’ achievements taken are at the same level or unbiased before the use of the mind map on the experimental group. This statement also shows the average good student from the control group or the experimental group have equivalent knowledge existing in history. Majority of the students do not revise the subject before entering the class results to disability to answer well in pre-test. Most of the students attained Grade E and G. In the control group, marks obtained is between E and G grade while the experimental Group majority acquires grade E and G.

T count value was 5.852. Critical values of t is 1.96 at alpha (α = 0.05). Therefore, in conclusion, Post-test scores from groups is different in mean or average significantly. This shows that there are changes in the level of achievement of the control group or the experimental group in the knowledge of history. Pre-test for the control group, majority of students which is 63.6 percent of the total students got grade G in the pre-test, while the balance of 36.4 percent obtained Grade E. After going through teaching and learning using conventional methods, t count was 5.852. Critical values of t is 1.96 the achievement of students in post-test showed a slight increase grade performance. Referring to students who obtain grade E, represents the largest portion of which is 31.8%, whilst the lowest grade C percentage 9.1%. The percentages of other figure are 22.7% for grade C+ and D, while grade just posted 13.6%.

In the experimental group, majority students of 63.4 percent from the total of students who got grade G in the pre-test while the most minority grade amounted to 3.3 percent acquired by the grade D and C. Between the majority and minority, percentage of 30 with grade E or 9 students from the total of 30 students. After going through teaching and learning method using mind map, experimental group students’ achievement in post-test showed a significant growth of grade. Clearly seen grade C posted a 36.7% which is the highest percentage whilst the lowest was shared by grade A and D with the percentage of 3.3%. The rest, 26.7%, 20% and 10% was recorded by a grade C+, B and B+. The line chart shows an increase in test scores before and after for the control group. But the increase is far from an increase in Figure 4.9 for the experimental group. The lower marks for pre-test approaching 20 while the highest post-test is nearly approximate to the scores of 60.

The mean difference is more significant or large in the Experimental group with a mean difference, 22.133, compared to the mean difference in the control group which is 13.955. The results obtained proved the use of mind map has been successfully helping students of Experimental Group achieved better grades compared to the use of conventional method by the control group in History lesson.

5. DISCUSSION

The study also shows that the level of achievement of each student in History is encouraging if they are given early exposure by using the method of teaching and learning using a mind map. The findings of this study shows that the samples’ performances from the experimental group is higher and significantly different than the control group. The findings of this study meets the previous study that found the use of mind map able to increase the achievement of students in a subject such as a study by Azizi and Jair in the subject of history. The findings of this study showed students with low achievement able to increase their performances in the subject of history with the techniques of mind map as part of learning History at school. The use of mind map is one of the technique to help low performance students in improving their achievement; this is align with a study carried out by Azizi and Jair.

The findings will help the school to boost the achievement in historical subjects. The outcome of the study shows that the students’ achievement in History has increased after the exposure of teaching using concept mind map to the students involved. It could be an eye opener for the History Panel in school to make the technique teaching concept map as a teaching technique which should be used by all of History teachers.

The findings prove that the mind map is a teaching material in students’ teaching and learning process. The study also proved that the teaching materials in the form of visual not only facilitate students but also facilitates the students in describing them. In accordance to the statement of Buzan states that the graphic materials and photographs drawn able to stimulate thought, facilitate understanding and strengthen students’ memory. In addition, the use of the mind map as teaching materials will make teaching
Modeling the Relations of Motivational Variables as Explanatory Factors of Science Achievement in Malaysian Context

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The focus of this study was to test a three-path (two-mediator) model to test the possible mediational pathways by which students' motivational variables (FTP; epistemological beliefs; self-efficacy, implicit of intelligent) are related to their science achievement, mediated through goal orientations and learning approaches. Thus, it is necessary to fill the gap in the literature on students' achievement motivation by developing and testing a hypothetical mediational model that addresses all these factors in a single study, and explores the mediational relationships hypothesized in the model, for a better understanding of the role of goal orientations and learning strategies in Malaysia science education.

Keywords: Motivational Variables, Explanatory Factors, Science Achievement.

1. INTRODUCTION

Currently, the curriculum in Malaysia emphasizes the acquisition of learning ability, the inculcation of scientific attitudes and thinking skills. Besides that, the acquisition of scientific and technological knowledge and its application to the natural phenomena is also equally emphasized. In the Malaysian context, education systems are trying to enhance the effectiveness of learning and success in studying has become the focus among teachers, students, policy makers and also educational researchers. Confronting issues of academic motivation is critical for them. Teachers who design curricula aimed at increasing student interest in the subject matter they teach must also attend to what motivates their students and what leaves them languishing in their seats. Those who study questions such as why students succeed or fail in certain academic contexts must address motivational factors that influence how students perform in particular situations.

Since the early 1960s, research work in the psychology of motivation has focused the factors as individual differences in study methods, parental involvement, school facilities, belief, demographic and intelligence variables. In recent decades, the literature supports achievement goals, FTP, achievement goal orientation and learning strategies as contributing factors of academic success. The prediction and explanation of the factors that contribute to learners' academic success are important. To date, however, very few attempts made to amalgamate these two strands of inquiry within one research and how the variables determine the success of learning. Adopting a combination of motivation variables, the present study was to explore the modeling the relations of motivational variables as explanatory factors of Science achievement in Malaysia.

2. STATEMENT OF PROBLEMS

For a learner, the purpose of knowledge is not only to remember specific information, ideas and facts but also the search for evaluation, analysis of ideas, broader context and vice versa. In fact, there is a need to learn a new culture of learning will be characterized by greater individualization in the construction of knowledge. A learner has to understand the acquisition of knowledge and balance the development of life skills so that they will understand the concept and value of lifelong learning. In spite of this, providing a quality education to lower and higher secondary students with equity is also a major challenge to the sector. Therefore, it is also essential to understand how students can be motivated to learn and perform well in educational settings with the current standard of Malaysia education.

The literature shows that student characteristics, such as motivation, self efficacy, FTP and epistemology, can have a positive impact on goal orientated performance and learning approach. Especially, Future time perspective (FTP) has emerged recently as an important line of research inquiry in educational psychology. It is concerned with how students perceive and express their relationships to the future that encompasses...