

EVALUATION USABILITY MEASUREMENT INDEX FOR HIGHER  
EDUCATION INSTITUTE

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This dissertation is dedicated to my family for their endless love, support and encouragement.

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## ABSTRACT

The Usability Measurement Index (UMI) for Higher Education websites is an instrument to measure the usability of higher education websites using the weighted-point based system. It has been proposed to overcome the shortcomings of Webometrics, which merely rank HEI websites based on certain criteria that are not related to usability. Testing of UMI has shown that it can be used to measure the usability of HEI websites. However, this is based on a small-scale study comprising of two HEI websites and 40 respondents. Thus, the aim of this research is to validate the instrument. In order to successfully validate it, ratings were given to each category and factors that had been previously proposed. Then total score were given based on both weights and ratings. Besides that, the Think-Aloud method had been applied as an appropriate add-on value to the UMI in order to increase its validity. In this research, two of the HEI websites from the Webometrics rank were used and an increased number of participants that is 60 participants were involved. The results were compared with their rank on the Webometrics ranking. The result showed that the gap between the two HEI websites were not as huge as shown in the Webometrics ranking. So, the rank of the Webometric is not the true reflection of the overall usability of the website itself. The UMI is considered validated because the instrument had been added an add-on value in Think-Aloud method and higher number of participants involved.

## ABSTRAK

Indeks Pengukuran Kebolegunaan (UMI) untuk laman web institut pengajian tinggi (IPT) adalah satu instrumen untuk mengukur kebolegunaan laman web pengajian tinggi dengan menggunakan sistem berasaskan wajaran mata. Ia telah dicadangkan untuk mengatasi kelemahan Webometrics, yang mana ranking Webometrics hanya berdasarkan kriteria tertentu yang tidak berkaitan dengan kebolegunaan laman web IPT. Ujian UMI yang telah dilakukan sebelum ini menunjukkan bahawa ia boleh digunakan untuk mengukur kebolegunaan laman web IPT. Walau bagaimanapun, ini adalah berdasarkan satu kajian kecil yang melibatkan dua laman web IPT dan 40 responden. Oleh itu, matlamat kajian ini adalah untuk membuat validasi terhadap instrumen yang digunakan. Untuk membuat validasi dengan berjaya, rating telah diberikan kepada kategori dan faktor yang telah ditentukan. Kemudian, jumlah skor diberikan berdasarkan pemberat dan rating. Selain itu, kaedah *Think-Aloud* telah digunakan sebagai penambahan yang sesuai kepada instrumen indeks ukuran kebolegunaan bagi meningkatkan kesahihannya. Di dalam kajian ini, dua laman web IPT dari Webometrics telah digunakan dan jumlah responden yang lebih tinggi iaitu 60 responden telah terlibat. Hasil keputusan dari kajian ini dibandingkan dengan kedudukan kedua-dua laman web tersebut di Webometrics. Keputusan menunjukkan bahawa jurang antara kedua-dua laman web IPT tersebut tidak begitu besar seperti yang ditunjukkan dalam ke ranking Webometrics. Ranking Webometrics tidak menggambarkan keadaan sebenar kebolegunaan laman web itu sendiri. UMI telah divalidasikan kerana instrumen telah ditambah nilai dengan menggunakan kaedah *Think-Aloud* dan jumlah responden yang lebih tinggi terlibat dalam kajian ini.

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## **CHAPTER 1**

### **PROJECT OVERVIEW**

#### **1.1 Introduction**

Nowadays, almost every people use the Internet to connect to others or share information about them. That is why websites are important aspects need to be address and properly constructed. It helps people to connect and understand better what information that you want to send to them. This matter brought up the importance of the websites usability. Based on the definition from (Eason's, 1988), usability is an ease-of-use oriented that is "the degree to which users are able to use the system with the skills, knowledge, stereotypes and experience they can bring to bear". There were many different method and techniques that were used by past researchers to evaluate the usability of websites. One of the methods that were frequently used is by using questionnaire.

In today's world, many Higher Education Institute (HEI) are expanding their influence to the rest of the world, not just around their geographic location. What better way to do that than using their websites. So, the race for HEI websites supremacy is going on until now. That is why websites are important for HEI to be successful and to be recognized all over the world. The main objective for this research is to validate the proposed websites usability measurement index instrument. The assessment of the method that can be used to evaluate websites

measurement index will also be done because it is an integral part when validating the usability measurement index instrument. In order to get the right selection in the target group and ultimately valid results, a suitable sampling method must be identified. This will ensure all the input data correctly support the evaluation method. Suitable add-on value for the instrument will be assessed in order to increase its validity. Finally, the results of satisfaction will be compared with the websites rank listed in Webometrics. This is done to see whether the results are reflected to Webometrics rank or not. Why Webometrics? It will be explain in the background of problem section.

## **1.2 Background of Problem**

Websites are an important asset to all HEI because it can give so many information to all people all over the world regardless of their geographic location. It is crucial to promote the HEI and give a first impression to the potential customer to choose them. In order to navigate and determine how usable the HEI websites, two Malaysian's HEI websites according to Webometrics rank, will be chosen as part of the process. These chosen HEI websites will be compared using the proposed research based usability measurement index (UMI) that has been developed by previous researcher (Chrispin, 2010).

Why choose HEI websites from Webometrics? Webometrics is a leading initiative from Cybermetrics Lab that focuses on ranking of worldwide universities. It is widely used by HEI all over the world to measure their website presence compared to other HEI. So it is suitable to choose HEI websites from Webometrics rank because it is widely used. In order to rank HEI websites, Webometrics are using design and weighting of indicators as their methodology. There are four indicators that are considered that are size, visibility, rich files and scholar. Size is the number

of pages recovered from search engine such as Google, Yahoo and Bing Search. Visibility is the total number of external links received by a site according to Yahoo Site Explorer. Rich files is data about file format that were extracted using Google, Yahoo and Bing such as pdf, doc or docx, ppt or pptx and ps or eps. Meanwhile scholar is a combination of items published between 2006 and 2010 in Google Scholar and the global output (2004 – 2008) obtained from Scimago SIR.

On the other hand, research based usability measurement index are different than Webometrics. It use questionnaire to get the usability performance of the websites. Based on (Chrispin, 2010), the Weighted-Point based usability evaluation methodology was used. It consists of five main components that are categories, factors, weights, ratings and total score. Categories are the broad areas to be investigated. Factors are the specific elements comprising each category. Weights are the importance placed on each category and factor. Ratings are the scores assigned to each category and factor. Meanwhile total score is an overall compilation based on both weights and ratings. The only problem for this usability measurement index is the instrument in this methodology is not yet proven its validation because it is only tested on a small scale. Thus, suitable method of validation must be made to the usability measurement index instrument on a larger scale.

As we can see, Webometrics and research based usability measurement index is using different methodology. From the HEI websites usability point of view, the rank in Webometrics may not provide the true reflection because of the methodology used by Webometrics. That is why two Malaysian's HEI websites from the Webometrics is chosen to be used with the reseach based usability measurement index. The outcome of the result from the research based usability measurement index then will be compared to the Webometrics rank to see whether the websites usability result reflect the rank listed in the Webometrics.

In order to validate the research based usability measurement index instrument, suitable add-on value need to be added to the instrument itself. One of

the suitable add-on value is by using the Think-Aloud method. Think-Aloud is a method that involves the user speaks when performing a task, that is the questionnaire in this research. By thinking aloud while attempting to complete the task, users explain their approach of attempting to perform the task; hence illuminating the difficulties they encounter to complete it. This can be done by using Think-Aloud to pilot test the questionnaire before using it. The main problem is to use the Think-Aloud efficiently in order for it to align with this research.

Sampling type also must be choose carefully. This is because there are many type of sampling to choose from that can be suitable or not for this research. There are also many type of student background in Universiti Teknologi Malaysia (UTM). Different student background can have different effect on student satisfaction level. So, the criteria for student selection must be watch properly in order to get high validity of the result. Furthermore, selecting students to evaluate their own university, that is UTM, can create a bias result. This will significantly reduce the quality of the result of the Think-Aloud and the research itself. Based from the explanation above, these three criteria is very important and need to be considered as it can influence the outcome of this research.



### **1.3 Problem Statement**

This project aims at responding to questions posed on the validation of websites usability measurement index instrument. The main research question is how to validate the proposed websites usability measurement index instrument. Other research questions for this project are:

1. What method can be used to evaluate websites usability measurement index?
2. What add-on value can be applied to increase instrument validity?
3. How does the result of satisfaction in this project reflect the rank listed in Webometrics?

### **1.4 Project Objectives**

The main objective for this project is to validate the proposed websites usability measurement index instrument. Other objective are as stated below:

1. To assess the method that used to evaluate the websites usability measurement index.
2. To assess the suitable add-on value that can be applied to increase instrument validity.
3. To compare the results of satisfaction with the rank of the HEI websites listed in Webometrics to see whether the result reflected the rank listed.

## **1.5 Project Scope**

Assessing the usability of highest-ranking Malaysia's HEI website according to Webometrics rank would require the utilization of requirement techniques and data analysis methods. These include qualitative and quantitative data collection techniques and basic statistical analysis procedure. The research target group is limited to present undergraduate and postgraduate UTM students except student from the Faculty of Computing. Purposive sampling will be used to select sample nonrandomly using a set of important characteristics. Simple random sampling is used to assign randomly the two website that needed to be evaluated across all participants.

## **1.6 Importance of the Project**

The main motive of the research is to validate the proposed websites usability measurement index instrument. In order to successfully validate it, the method used to evaluate the websites usability measurement index need to be assessed. Then, suitable add-on value to be added to the instrument used in this research will also be assess to increase the instrument validity. Besides that, a suitable sampling method must be identified. Then, the results of satisfaction from the proposed websites usability measurement index will be compared with the rank of the HEI websites listed in Webometrics to see whether the result reflected the rank listed.

## 1.7 Motivation of Study

There is a lack of study in the usability measurement index of Higher Education Institute website compared to other website. Table 1.1 below provides an example of usability measurement index from other type of websites.

**Table 1.1:** Other Type of Website UMI

Title	Type of Websites
Usability Metrics for Measuring Usability of Business-to-Consumer (B2C) E-Commerce Sites (Isaac J. Gabriel, 2007).	Business-to-Consumer (B2C)
Usability Evaluation of Web Services by Structural Equation Modeling (Alexander Nikov, Selim Zaim and Asil Oztekin, 2006).	Web Services
A Task-oriented Approach to Search Engine Usability Studies (Isak Taksa, Amanda Spink, and Robert Goldberg, 2008).	Search Engine

The study about usability measurement index of Higher Education Institute websites is limited and not generally to be used to rank every HEI websites around the world. Table 1.2 below provides an example of usability measurement index that available for HEI websites.

**Table 1.2:** Available Higher Education Institute UMI

Title	Type of HEI Websites
Assessing the Usability of University Websites: An Empirical Study on Namik Kemal University (S. Ahmet Mentés and Aykut H. Turan, 2012).	Namik Kemal University only

A Web Usability Evaluation Model for Higher Education Providing Universities of Asia (Mirfa Manzoor and Walayat Hussain, 2012).	Higher Education Institute in Asia only
Usability of the Academic Websites of Jordan's Universities An Evaluation Study (Suleiman H. Mustafa and Loai F. Al-Zoua'bi, 2008).	Jordan's Universities only

There are many type of rank of HEI available nowadays. But the methodology that was used by the ranking that make it different from each other. There are rank for the excellence of the HEI itself and also its website. In this research, we focus on the HEI website only. Even to rank the HEI website, there are many type of methodology. There are ranking that is based on keyword, category, country, popularity, traffic and many more.

Among many of the ranking, Webometrics ranking is chosen because it is one of the popular choice when it comes to measuring HEI website rank. It uses design and weighting of indicators as its methodology. The four indicators that are considered are size, visibility, rich files and scholar. This research is focusing on the usability of HEI websites and the methodology used by Webometrics did not reflect the website usability performance. Therefore, the research based usability measurement index (Chrispin, 2010) is needed to provide a ranking that present the HEI website usability performance. It will be valuable to HEI all around the world because they can use this rank to determine the usability of their website.

Based on the past research on usability measurement index of HEI, the framework is far more comprehensive compared to other research. The framework had been carefully design to make sure that it covers all the aspects that are important in HEI websites. Besides that, it is not solid enough to use because the instrument is only tested in small scale before. This research can improve its validation because it will be tested on a bigger scale. This will make it more solid for use in the future.

## **1.8 Chapter Summary**

This chapter explained about the what is this research is really about. The background of the problem is throughly explained in order to give better understanding of the problem. Then, the problem statement and this research objective is stated. This is important to this research because it provide a clear goal on what this research need to achieve at the end of it. The project scope and the importance of the project were also discussed in this chapter. Furthermore, the motivation of study were explained in order to provide the reason why this study was valuable to HEI around the world.

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