# SENTIMENT BASED INFORMATION RETRIEVAL FRAMEWORK FOR CULTURAL PSYCHOLOGY

BY

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# ABSTRACT

People share their opinion and information through social networks platforms such as Twitter, You Tube, and Facebook. Their shared opinions towards certain issues are sentiments that could be productive, constructive, or possibly controversial. These opinions are positive or negative sentiments. Sentiment analysis are done mainly on marketing and political issues. They focused on trends to improve their services to achieve their targeted audiences and customers. However, there is yet a need to conduct sentiment analysis on cultural psychology issues. Thus, this research aimed to analyse and categorize the sentiments people shared on a social network pertaining to the selected issues on topics in cultural psychology. The Zheng and Fang model was adapted for sentiment analysis. Three social networks were selected; You Tube, Facebook, and Twitter that offer search capability enabling the retrieval of posted comments and opinions. A sample of 100 cases based on the selected topics have been collected and formulated as queries. The queries retrieved the sentiments. The identified sentiments were analysed and classified as positive and negative and topically categorized based on a value system using WordStat8 and LightSIDE toolkit. The Prabowo and Thelwall combined model of sentiment analysis was referred to for categorization. The outcomes included a pool of positive and negative sentiments; and topic categorization developed based on sentiment analysis. Kappa, recall, precision and F-Scores were reported to range from -0.01 to 0.23, 0.06 to 1.00, 0.14 to 0.96, and 0.04 to 0.86 correspondingly. Overall, Kappa, precision, and F-scores ranged from very low to high ratios, except for the perfect recall.

# خلاصة البحث

يشارك الناس آرآءهم ومعلوماتهم عبر مواقع التواصل الاجتماعيّ مثل Twitter و You Tube Facebook. وفي الحقيقة إنّ تلك الآراء المشتركة مجرّد مشاعر شخصيّة يمكن أن تكون مثمرة أوبناءة أو مثيرة للنقاش كما أن تكون إيجابيّة أو سلبيّة. فتلك الآراء المشتركة بشكل رئيسيّ تهدف إلى ترويج المنتجات أو تمسّ القضايا السياسيّة. وهؤلاء الناس يركّزون على عدّة وسائل لتحسين خدماتهم من أجل الحصول على الجماهير والعملاء المستهدفة. رغم ذلك، هناك ضرورة في التحكّم على عمليّة تحليل المشاعر في القضايا المتعلقة بالسيكولوجيّة الثقافية. لذلك هذا البحث يهدف إلى تحليل وتصنيف المشاعر التي يشارك الناس في مواقع التواصل الاجتماعي، خاصة في القضايا المعيّنة المتعلّقة بالسيكولوجية الثقافية. إنّ نموذج Zheng و Fang قد تمّ تكييفه لتحليل المشاعر. وقد اختيرثلاث مواقع التواصل الاجتماعيّ وهي؛ You Tube و Facebook و Twitter التي تقدم إمكانية البحث التي تتيح استرداد التعليقات والآراء المنشورة. وتمّ جمع عينات البحث من 100 حالة بناءً على الموضوعات المختارة وصيغت كاستفسارات البحث. وتلك الاستفسارات تسترجع المشاعر. وقد حللت وصنّفت المشاعر التي تمّ تحديدها على أنّها إيجابية وسلبيّة فضلا عن تصنيفها بشكل موضوعي استنادا على نظام القيمة و LightSIDE toolkit. وقد تمت الإشارة إلى تصنيف Prabowo و Thelwall المشترك لتحليل المشاعر من أجل التصنيف.فإن نتائج البحث عبارة عن مجموعة من المشاعر الإيجابية والسلبية وتصنيف الموضوع وتمّ تطويره على أساس تحليل المشاعر. وذكر عن Kappa ، recall ، precision و F-Scores تتراوح من -0.01 إلى 0.23 ، 0.06 إلى 1.00 ، 0.14 إلى 0.96 ، و 0.04 إلى 0.86 بالمقابل. وعموما، اكتشفت النتائج أن الترتيب من نسبة منخفضة جدا إلى نسبة عالية، باستثناء الاسترجاع التام

# APPROVAL PAGE

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# DECLARATION

I hereby declare that this dissertation is the result of my own investigations, except where otherwise stated. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at IIUM or other institutions.

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Signature …… Date …….

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# TABLE OF CONTENTS

Abstract ..... ii
Abstract Arabic ..... iii
Approval Page ..... iv
Declaration ..... v
Copyright Page ..... vi
Acknowledgement ..... vii
List of Tables ..... xi
List of Figures ..... xii
List of Abbreviations ..... xv

**CHAPTER ONE: INTRODUCTION ..... 1**
1.1 Background of Research ..... 1
1.2 Statement of Problem ..... 11
1.3 Research Objectives ..... 12
1.4 Research Questions ..... 13
1.5 Operational Definition of Terms ..... 14
1.6 Research Design ..... 21
1.7 Scope of Research ..... 24
1.8 Delimitation of Research ..... 24
1.9 Research Contributions ..... 26
1.10 List of Tools and Toolkits in This Research ..... 26
1.11 Conceptual Framework ..... 28
1.12 Assumptions for This Research ..... 31
1.13 Significance of Research ..... 31
1.14 Summary ..... 31

**CHAPTER TWO: LITERATURE REVIEW ..... 34**
2.1 Introduction ..... 34
2.2.1 Social Media Networks and Information Retrieval ..... 35
2.2.1.1 Social Media Networks and Retrieval System ..... 35
2.2.1.2 Theories Applied in Social Media Networks Research ..... 36
2.2.1.3 Models Applied in Social Media Networks Researches ..... 36
2.3.1 Sentiment Analysis Frameworks and Models ..... 39
2.3.1.1Overview of Sentiment Analysis ..... 39
2.3.1.2 Corpus-Based Frameworks and Models for Sentiment Analysis ..... 39
2.3.1.3 Lexicon-Based Frameworks and Models for Sentiment Analysis ..... 40
2.4.1 Sentiment Analysis and Social Media Networks ..... 41
2.5.1 Cultural Psychology and Muslims ..... 48
2.2 Gaps in Previous Research Works ..... 48

2.3 Summary ..... 53

**CHAPTER THREE: METHODOLOGY……54**
3.1 Introduction ..... 54
3.2 Population of the Social Media Networks ..... 54
3.3 Sampling of the Social Media Networks ..... 55
3.4 Data Collection for Sentiments ..... 56
3.4.1 Advantages of Lightside Toolkit System ..... 57
3.4.2 Advantages of QDA Miner And Wordstat 8 Toolkit System ..... 60
3.5 Data Analysis ..... 64
3.5.1 Pilot Study ..... 73
3.5.2 Samples of Search Results ..... 87

**CHAPTER FOUR: DATA COLLECTION AND RESULTS……96**
4.1 Introduction……96
4.2 Data Collection ..... 94
4.2.1 Classification for the Sentiments ..... 94
4.2.2 Extraction of Topic Categorization ..... 96
4.2.3 Evaluation on the Proposed Framework System ..... 97
4.3 Collections of the Sentiments on Cultural Psychology ..... 104
4.3.2 Topics Categorization on Cultural Psychology ..... 106
4.3.3 Measurements of the Sentiments ..... 111
4.3.4 Performance of the Proposed Framework Retrieval System ..... 118

**CHAPTER FIVE: DISCUSSIONS……127**
5.1 Introduction ..... 125
5.1.1 Overviews ..... 125
5.2 Framework Adopted ..... 127
5.2.1 Significance of the Framework Models ..... 128
5.3 Captured Sentiments ..... 129
5.3.1 Corpus of the Sentiments on Cultural Psychology ..... 131
5.4 Classification of the Sentiments ..... 132
5.4.1 Classification Adapted from Model ..... 132
5.5 Topic Categorization for Retrieval Framework ..... 132
5.5.1List of Topics on Cultural Psychology ..... 132
5.6 Scores of the Sentiments ..... 134
5.6.1Evaluation of the Scores ..... 134
5.6.2 Evaluation on the Framework Performance ..... 136
5.7 Summary ..... 141

**CHAPTER SIX: CONCLUSIONS……144**
6.1 Introduction ..... 144
6.2 Overview of the Research ..... 144
6.3 Highlights of the Research ..... 145
6.4 Recommendations for Future Research ..... 149

6.6.1 Theoretical Contribution ..... 149
6.6.2 Practical Contribution ..... 149

**BIBLIGRAPHY……156**

APPENDIX I: QUERIES FOR SEARCH……..169
APPENDIX II: LIST OF JOURNALS FOR SEARCH TERMS ……..172
APPENDIX III: RESULTS FOR SENTIMENTS BASED ON THE MEASUREMENTS……182

# LIST OF TABLES


| Table No. | | Page No. |
|---|---|---|
| 1.1 | Overview of the research framework | 26 |
| 1.2 | Conceptual framework | 28 |
| 3.1 | Ranking of top 16 social media based on the monthly active users | 55 |
| 3.2 | Evaluation metrics for accuracy | 83 |
| 3.3 | Pilot study been measured based on the statistical measurement for sentiments classifications | 84 |
| 3.4 | Results of topics extraction processed by WordStat8 | 91 |
| 4.1 | Statistical description of the captured sentiments | 96 |
| 4.2 | Sample values of metrices obtained from machine learning tool (LightSIDE) | 99 |
| 4.3 | Range of precision, recall, f-score, and accuracy values | 101 |
| 4.4 | Guideline for interpreting kappa- statistic | 101 |
| 4.5 | Common topics in cultural psychology references based on keywords analysis by case | 108 |
| 4.6 | Achieved values for precision, recall, f-score and kappa | 112 |
| 4.7 | Confusion matrix predicted and recall precision labels | 118 |
| 4.8 | Sample of the precision, recall based on ten queries | 121 |
| 4.9 | Value scores for questionnaire | 122 |
| 5.1 | Explains how the confusion Matrix table works | 136 |
| 6.1 | Review of the research results | 147 |

# LIST OF FIGURES


| Figure No. | | Page No. |
|---|---|---|
| 1.1 | The architecture of the system developed by Zheng & Fang | 19 |
| 1.2 | The combined approach for experiment proposed by Prabowo and Thelwall | 20 |
| 1.3 | Flow chart process to collect data from social media networks | 23 |
| 1.4 | Diagram for research scope | 24 |
| 1.5 | Proposed Framework for Social Network-Based Retrieval System Framework for Sentiment Analysis | 30 |
| 3.1 | Coding Retrieval tool lists all text segments associated with Framework for Sentiment Analysis some codes or with specific patterns of codes | 61 |
| 3.2 | Text Retrieval tool searches for specific text patterns in documents | 62 |
| 3.3 | Features for text mining platforming Wordstat | 63 |
| 3.4 | Topic extraction for topic modeling | 64 |
| 3.5 | Samples for documents retrieved from the selected social media in CSV | 67 |
| 3.6 | Documents imported from the csv file and extracted to LightSIDE system | 68 |
| 3.7 | Basic features statistic for sentiment analysis | 69 |
| 3.8 | Process to build model for sentiments classification training data set | 70 |
| 3.9 | System tool analyzed the sentiments | 71 |

| | | |
|---|---|---|
| 3.10 | Systems tool explore the result of the classification | 71 |
| 3.11 | Prediction of labels of the training set | 72 |
| 3.12 | Sample of the captured comments classified | 74 |
| 3.13 | Text processing in WordStat for topic categorization model | 76 |
| 3.14 | Extraction for Topics shows the process of the topic's Extraction | 76 |
| 3.15 | Precision and recall measurements (Caraciolo, 2011) | 78 |
| 3.16 | Formula for precision and recall | 79 |
| 3.17 | Statistical Measurements Calculated | 80 |
| 3.18 | Explained on high recall, low precision. | 81 |
| 3.19 | Explained on low recall, high precision | 82 |
| 3.20 | Explained on high recall, high precision | 82 |
| 3.21 | Interpretation of the Cohen's kappa for interrater agreement | 84 |
| 3.22 | Agreement level for kappa value | 85 |
| 3.23 | Amount of correct data by % agreement or squared kappa value | 85 |
| 3.24 | Sample of results retrieved from twitter using the "Muslim acculturation" keyword | 87 |
| 3.25 | Sample of results from YouTube based on the "Islamophobia" keyword | 88 |
| 3.26 | Sample of results from Facebook, searched using "*Muslims cultures"* keyword | 89 |
| 4.1 | Title of publication contained search term "Acculturative" | 104 |
| 4.2 | Search result attained from Twitter with the search term ***"Acculturative stress*** | 105 |
| 4.3 | Search results were labelled into two columns; text and class with the search term ***"acculturative stress"*** | 105 |

| | | |
|---|---|---|
| 4.4 | Result shows the data extracted by the tool system | 111 |
| 4.5 | Build models for the train data set | 112 |
| 4.6 | Explore results for the training data after the build model | 113 |
| 4.7 | Compare models feature used to train data | 114 |
| 4.8 | Accuracy value based on the Naïve Bayes classifier | 115 |
| 4.9 | Comparison of two models | 116 |
| 4.10 | Predict label for the test data | 117 |
| 5.1 | Mutual constitution of psychology and culture | 127 |
| 5.2 | Zheng and Fang (2010) model | 128 |
| 5.3 | Prabowo and Thelwall, (2009) model | 128 |
| 5.4 | Distribution of phrases based on frequency | 134 |
| 5.5 | Indri lemur retrieval interface | 140 |
| 5.6 | Sample of result from indri lemur | 140 |
| 5.7 | Sample of result from indri lemur in html file | 141 |

## LIST OF ABBREVIATION

| | |
|---|---|
| CSV | Comma-Separated Values |
| GIBC | General Inquirer Based Classifier |
| oneR classifier | One Rule Classifier |
| QDA Miner | Qualitative Data Analysis Software |
| RBC | Rule Based Classification |
| RO | Research Objective |
| RQ | Research Question |
| SBC | Statistics Based Classifier |
| SVM | Support Vector Machines |
| Weka | Waikato Environment for Knowledge Analysis |

# CHAPTER ONE

# INTRODUCTION

## 1.1 BACKGROUND OF RESEARCH

Information technology emerges and affects the social world. People express their emotions to the public through a social media network, for example, Facebook and Twitter positively or negatively in responding to a particular issue.

Social media networks are being popular among people nowadays. People communicate through social media in two ways of communication; where the receiver of the information can react back to the informer. In addition, the system enables people to convey information in one-to-many, or many-to-many; which one informer can share information to others and also various informers can share with other people concurrently.

According to Brown (n.d.), social networking refers to making a group of individuals into specific groups, like small rural communities or a neighborhood subdivision. Online social networking has taken place at workplaces, universities, and high schools. Social networks connect an online community of internet users; whose members share common interests. Kardara et al. (2015) suggested that among the social networks' users, there was a person known as influencer, who had the ability to influence and attract the other person such as followers to approve particular activity or any issue. Influencer carries scientific and marketing background.

Social network has various purposes, where users can develop a mutual relationship. They can interact, share knowledge, experience, and interest using social

networks (Lea et al., 2006). Their reaction replicated their cognitive and behavior styles (Yoon & Tourassi, 2014). Shared information among group members on the sensitive issue should be among the group circle only to avoid any controversial issues occurred. Ranjbar and Maheswaran (2011), had proposed an algorithm to avoid the risk of information leaking beyond the group. It enables a controlled sharing of information and reduces the risk of leaking. Besides, sharing their status through social networking services openly create harm and risk to the users (Haynes and Robinson, 2015).

The use of social network has been improved as a mainstream to do online business among the sellers and their targeted and potential customers. According to Klein et al., (2015), they have shared personal activities within their circles and have a significant impact to influence the closeness among the network members. Emotional reaction and professional concern embedded in sentiments can predict the stock market. Nguyen et al., (2015), proposed a model that significantly improved the big data and performed better compared to the non-topic.

Terms or words used among the social media users can be ambiguous or carrying deep meaning beyond the normal meaning. For example, the terms used for expressing emotions such as happy or sad. Reyes et al., (2010) claimed that the use of words for humorous and irony in social media should be studied in depth because they are carrying information for the others.

Besides, people use social media networks as their medium to share enhancement business services. However, because of the huge volume of information, people have difficulty in retrieve their preferred information; where they have to linked as a friend and also need to be active. Thus, the information shared should categorized into topics which carried similar terms or words in terms of frequency (Papadakis et al., 2012).

Social media features function today, enabling their users to post and share comments, photos, videos, and microblogging on their preferred issue. However, the huge information, which is unorganized in wisdom way. Thus, implementing the information retrieval shoul done to assist the users of social media to gain relevant and organized information needed (Boughanem, 2013).

Twitter is one of the social media networks used by people to share opinions and information. However, compared to the traditional media, new medium, information on twitter are unsupervised. Therefore, based on topic modeling, the information on twitter has supervised by topics (Zhao, et al., 2011).

Facebook

One of the most common and popular online social networks is Facebook. A. Pereira et al., (2013) mentioned that companies used Facebook as one of their marketing tools to create awareness, improve their decision making, gather feedback based on "share" or "like". However, there is a user whom have a high tendency to compare themselves with other users (social comparison orientation) affected their psychology wellbeing side in the negative way (Vogel et al., 2015). We can observe personal characteristics of a Facebook user based on theirs "like" status on a particular post (Yamane and Hagiwara, 2013). For example, a person who click "like" on the post of a certain product, it showed that he or she interested.

Social presence is the strongest impacts of Facebook use among students for rapid communication and interaction. A group that shared norm values in similar also have a tendency to join the communication (Cheung et al., 2011). Meanwhile. According to Back et al., (2010), Facebook profile reflected the real personality of that user, such as the facial image, self-profile. An interesting study is done on the narcissism

and self-esteem of an individual on Facebook usage. They found it that person with high narcissism with low self-esteem occasionally and spending more time checking on Facebook (Mehdizadeh,2010). Yet, Facebook also have a negative side impact on learning and academic performance. Overly usage of Facebook significantly affects the lowly CGPA for students compared to nonusers (Kirschner and Karpinski, 2010).

More than a billion pieces of content to Facebook every day. Facebook Search enables journalists to filter through that content to find sources and story ideas on the platform. For journalists, Facebook is a Rolodex of more than 500 million potential sources. Using tools like the People Search and Group Search, journalists can find relevant sources for a story they are working on. Similarly, during breaking news situations, journalists can use Facebook's Open Search to find out how people are reacting to the news on Facebook. Here's an outline of how you can use Facebook Search as a journalist:

1. Open Search: Use Facebook Search to find public “posts by everyone” that are relevant to a news story user are covering. Use keywords from their story to filter results. They can put quotation marks around words (i.e. “word here”) for exact phrase searches.

2. People Search: The people search enables user to find sources that they are looking to contact on Facebook. They can filter by location, education and workplace. If the user finds someone who they may want to use as a source, they can go to their profile and message them privately through Facebook Messages without being their friend.

3. Facebook Groups: User can also search Facebook Groups to find sources who are members of specific groups. This can be useful for finding sources affiliated with political organizations, local organizations, etc.

4. Events: The Events search enables user to search through open Events being posted by people or organizations. If user covering an event, they can usually find the event organizers based on who created the event on Facebook.

5. Pages: Similarly, to Groups, Pages are often used for organizational and distribution purposes and can garner useful information around an organization or event. User can search for Pages by keywords.

Twitter

Twitter is popular among the social media users. However, the information shared might be overloaded and doubtful (alRubain et al., 2015). As the time progressed, the role of twitter is to share and discussed among friends. Hence, the role of twitter evolved as a base to share and viral information on current issues and events (Gupta et al., 2012).

Twitter is popular to share thoughts which available to followers to read, and also can be retweet as spreading to the other. It is known as microblogging, where 140 words can be put as text (Wang et al., 2015).

According to Kim et al., (2012), twitter is good and popular resources to study social behavior, focusing on sentiments and emotions. Certain reactions and responses from others on a particular issue could harm or encourage the others. Besides, twitter also known as microblogging, which is attracted various organizations as information repositories and extracted related information accordingly (Arias et al., 2013).

There are many ways to use the search on Twitter. User can find Tweets from yourself, friends, local businesses, and everyone from well-known entertainers to global political leaders. By searching for topic keywords or hashtags, users can follow ongoing conversations about breaking news or personal interests. Twitter gives users control over what users see in their search results through safe search mode. These filters

exclude potentially sensitive content, along with accounts users have muted or blocked from their search results.

You Tube

Another popular social media network is YouTube. It enables the users to share videos, preferably to their title and descriptions manually without assisting of an automatic machine (Kennedy, 2013).

Besides, YouTube also enabling the users giving rate to comments to improve the related opinions and avoiding negative contents in particular videos (Seirsdorfer et al., 2010).

YouTube covers various types of subject area, namely economic, political, religious, health, and many more. However, the content of videos cannot be accepted as reliable information. Keelan et al., (2007) focused the study on the benefits of immunization in YouTube videos based on content analysis. The result showed that the information shared conveyed more negative responses compared to positive, where could lead to false information.

Hence the ability to retrieve and watch any video that users expected, You Tube system limited the availability of videos because of copyrights and legal issues, and also inappropriate videos been block for those under 13 years old, while 13 until17 years old must approve by their parents (Lange, 2007).

By default, YouTube search results sorted by “relevance” and include all result types (videos, playlists, channels, etc). There can also “Featured” videos forced on top of search results, which are popular Spotlight picks or videos coming from YouTube partners.

According to Liu (2012), sentiment analysis defined as opinion mining that analyses opinions, sentiments, evaluations, appraisals, attitudes, and emotions. They

define sentiment analysis as finding the opinions of authors about specific entities. The decision-making process of people affected by the opinions (Feldman, 2013). According to Prabowo and Thelwall (2009), sentiment also defined as comments, feedback or critiques which provided useful indicators for different purposes. We can categorize these sentiments into two categories: positive and negative; or into an n-point scale, e.g., very good, good, satisfactory, bad, very bad. We can transfer information into knowledge from a big data of information (Beyer & Laney, 2012).

Posting the sentiments and emotions through social media is popular among the users such as an issue of elections has studied by Mohammad et al., (2014). They proposed an automatic classifier enable to predict the unnoticed tweets. However, it cannot distinguish different emotion that belong to same emotion. Research on sentiments is popular for the political issues. Maks and Vossen (2012) proposed a lexicon model for the description of the subjectivity of the verbs, nouns, and adjective use in political speech or text. These elements have been used to classified sentiments analysis in positive or negative.

Besides, sentiment analysis also enables people to gain new knowledge in certain crucial issues. For example, a study by Gaspar et al. (2012) on how people share their thoughts towards food crisis in Spain. They suggested that, based on the shared opinions, and sentiment analysis, it helps and encourage the affected people to cope with the disaster.

People put sentiments on social media in a way to show their feelings or emotions towards something that attracted. The sentiments encompass against or agree, meaning in that sentence or paragraph put on the social media. Social media play an important role in knowledge and information sharing. The operating features that

offered by social media such as like, share, tagging, and retweet, enabled the users to have their opinion sharing with others whom they linked. This lead to affect the other.

Culture and psychology one of the important issues today. There are positive issues that can be relate to; such as Islamic banking and finance, food, travel, fashion. Yet negative issues also emerged; for example, terrorist, immigrants, wars, etc.

Cultural psychology is one subject of psychology which related to the culture and human. It is a contrast with the other area in psychology because the finding of this area of study is cultural variables in terms of findings and theories. It is a set of ideas that relate to the whole process in human life including institutions, thoughts, feelings, beliefs that reflected to culture's values and beliefs (Snibbe, 2003).

Recently, in April 2018, London launched a Muslims' festival for culture, literature, and idea. That program held at British Library to give the opportunity for Muslims and non-Muslims to intermingling and to learn about the others culture (The Muslim Vibe, 2018). Such a program would bring the positivity ambiance for Muslims among non-Muslims, for negative propaganda promoted by the irresponsible persons.

Appearance of culture cannot seem by sight. It can carry elements such as actions, thoughts, rituals, traditions in a human being. Foods also have an influence in human life. For Muslims, halal food is very crucial for them because of the Islam rule of life. As for Muslim, confirmation on the halal food is important before consummation. Non- Muslims shared positive perception towards this issue because the only issue they concerned is the quality of the products (Ayyub,2015).

Other than foods issue, sports also able to bring the spirit of community between Muslims and non-Muslims. A study by Yassim, (2013) on how the popularity of the cricket sports bring the Muslims and non-Muslims in United Kingdom together. The

engagement with the community through the community service wider the scope the British society.

The September 11, 2001, had a huge impact on the west world. They have generalized Muslims as a terrorist. They called this situation as “Islamophobia”. Western set Islamophobia as an excuse to promote hatred towards Muslims and Islam itself. Muslims immigration to non-Muslims country also known as a minority group. This affect their psychological well-being.

Adjusting own culture in a foreign country which is not share similar cultural, has faced by the minority group. As Muslims, there are difficulties to face this situation, where the majority group has showed lack of understanding and prejudice. Chen et al. (2015) suggested that there was an awkward moment when Indonesian Muslims students in Taiwan being captured by the non-Muslims when they praying. Suggested later that the university should considerate and provide prayer’s room for them as their religious privacy. The impact of the tolerance among the non-Muslim from a different culture have a positive significance on the psychological and Muslims able to adapt the cross culture with no stress (Stuart et al., 2016).

Tummala-Nara and Claudius (2013), graduate Muslims students in United States need to coping and adapt the current culture they living. Some of them believe they need to educate their non-Muslims colleagues about Islam to avoid discrimination threat. Muslims women appear in public triggered the sense of discrimination from non-Muslims. They felt threatened by their appearance (Jasperse et al., 2011), which contradicted with pride and belongingness, and culturally related among Muslims. The appearance of Muslims whose wearing turban or hijab had stimulates the anger and