Information-Seeking Behaviour Model of International Students' Use of Social Media

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ABSTRACT

The purpose of this paper is to propose a model of information-seeking behaviour (ISB) of international students when they are using social media. A netnography is conducted on Facebook and we evaluated the both posts/comments. A thematic coding was performed on the both posts/comments and we have identified two main themes as information needs and information source, which were divided into sub-themes. Information needs are the information that international students required in a new environment. On the other hand, information source provides the solutions to fulfil the information needs. With the help of netnography and extant literature, this paper proposes the model of ISB of international students' use of social media. This study enhances the previous models of ISB and offers future research direction in validating the new model.

Keywords: Social media, social network analysis, information-seeking behaviour, international students.

I INTRODUCTION

In the last few decades, researchers in developed countries have conducted studies in different disciplines about the needs and information-seeking behaviour (ISB) of individuals and user groups (Anwar, Al-Ansari, & Abdullah, 2004). They have covered different perspectives of ISB in social sciences (Msagati, 2014), humanities (Mostofa, 2013) and science and technology (Sarkhel, 2014). Studies that determined the information needs and ISB of scholars and students in interdisciplinary fields were lacking (Bates, 1996). Since 1996, studies on ISB began to focus on students' information seeking (Bates, 1996). Numerous studies addressed the ISB of students in the library context but ISB studies in the social media context remain limited (Leeder & Shah, 2016).

The ISB and information needs of the international students are different from the local students' (Ishimura & Bartlett, 2014). International students come from various countries with different backgrounds, therefore they required a different set of information not typically required by the local students. In some instances, physical libraries were unable to provide the desired information to the international students (Hamid, Bukhari, Ravana, Norman, & Ijab, 2016; Liu, 2009). The trend of information-seeking has shifted from using libraries to adopting advanced technologies such as web/search engines and now to social media. However, the information derived from the Internet are basically general information and massive in number (Junyi & Min, 2013). To obtain a more relevant and useful information on social media, a person has to connect with another person (Quinn, 2016). This connection among people provides a specific type of information, opinion, advice and recommendation (Khoo, 2014; Morrison, 2015). Information exchange among people builds relationships within social media which provides the patterns of connection (Haythornthwaite, 1996). Thus, the ISB displayed by people using search engines and the ISB exhibited through the connection among people differ and need further research (Balakrishnan & Gan, 2016). In terms of ISB models, previous ISB models (e.g., Krikelas 1983; Leckie et al. 1996; Wilson 1997) are based on the information-seeking in the libraries or conventional document searching. Therefore, there is the need to reformulate a new model of ISB based on a more advance technology such as the Internet, particularly social media. Hence, this study aims to propose the model of ISB of the international students' use of social media. For this purpose, netnography approach was used as adopted from (Quinton & Wilson, 2016). The netnography is an approach and set of techniques used to exchange resources among individuals, groups or organisations.

Information exchange among actors or vertices builds relationship within a social network that provide connection patterns (Haythornthwaite, 1996). Relationships built on social media provide specific types of information, opinion, advice and recommendation (Morrison, 2015). The rest of the paper is organised as follows. Section 2 presents the literature review. Section 3 describes the methodology used in the study. Section 4 discusses the results. Section 5 provides the discussion and Section 6 provides the conclusion.

II LITERATURE REVIEW

The relevant literature is divided into three categories. The first category is concerned with the ISB models in order to understand the concept of ISB. The second category deals with the information needs of the international students that are required to fulfil the needs of the international students. The third category involves the social media platform used by the international students to seek information and their motivations to use the social media.

A. Information-Seeking Behaviour Models

Bukhari et al. (2016) reviewed the five popular ISB models. However, this research used the Ellis (1989) model as a theoretical lens for proposed the model, which lead to the useful design as compared to other models (Makri, Blandford, & Cox, 2008).

- **Krikelas (1983)** model provide an option for the seeker to gain information not only from system but also from human. So on this basis human is an important source for providing the information. Hence, in model most of the information for problems, already exists in individual memory. So, on this basis an individual memory is more helpful as compared to the system. It has thirteen components. Information giving and information gathering both create the environment need that has deferred needs and immediate needs. Immediate needs fulfil by internal and external source. For deferred needs memory and personal files are best option. Krikelas (1982) model is widely cited. Importance of this model is that it is very simple model and flow of a model is only in one direction. Limitation of this model is that it is based on past studies for a source i.e. recorded literature. Also interpersonal contact can be face-to face conversation but now social media environment blurs such boundaries.

- **Ellis (1989)** model is not based on diagram instead it is based on process which Ellis called features. He also mentions that the sequences of the features varied and they can iterate. Ellis model consist of six features later he added two more features. User begins to start the search from relevant source (Starting). Follow the citation or references in material (Chaining). Then semi-direct search the material (Browsing). Filter the relevant information from material (Differentiating). Keep up-to-date about material (Monitoring). Extract relevant information from new material (Extracting). Check the accuracy

(Verifying) and end the project (Ending). Ellis model is one of the popular model which is used in multiple studies such as for the scholar studies e.g. physicists and chemists engineers and scientist. Limitation of this model is that Ellis makes no claims that different behaviour can be a single set of stages and did not mention any source through which a person seek information or get any help.

- **Leckie et al. (1996)** model begins with the work roles and associate with task that generate the information needs. Characteristics of information needs and factors that influence are demographic, context of internally or externally needs, frequency of needs (new or existing), predictability needs, importance and complexity. Factors that affect the information seeking are the source of information and awareness of information. Source of the information can be categorised as type of channels like formal (conference or journal), informal (conversation), internal and external source of organization, oral or written in the form of paper or electronic text, person knowledge and experience. All arrows are the unidirectional except one arrow that connect information needs and outcomes to each other and they influence each other. Leckie et al., model proposed from the review of other studies. It build for professional rather than scholar or scientist because they think that information-seeking behaviour of professional is different from scholar and scientist and lack of understanding.
  One of the limitation of this model is lack of factors in models which Leckie et al. extract from the review studies and said them as a variables. Some of the terms does not fully explained (Case, 2012).

- **Wilson (1997)** model is a great version of the 1981 model. However, basic things of the 1981 model remain the same i.e., information needs and barriers. Wilson model is a complex model and have nineteen components. Activating mechanism called as a motivator factor that motivates the person to search the information at some extent. However, intervening variables affect the motivator factor and categories them into six types called psychological, demographic, role-related interpersonal, environmental and source characteristics. Wilson model is not based on only information science. It includes theories of different research field like psychological, decision making, innovation,

and consumer research and health communication. Niedzwiedzka (2003) criticise on Wilson (1996) model and proposed several changes i.e. about intervening variables, information source, activating mechanism and no need of theories.

- **Robson and Robinson (2013)** built the information-seeking and communication model that is combination of models from information-seeking behaviour and models from the communication models. This model has main nine components which are further divided into main sub-components. It include (1) context, (2) demographics, (3) expertise, (4) psychological factors, (5) an information user needs, wants and goals (6) an information provider's needs, wants and goals (7) motivating and inhibiting factors (8) features of information-seeking process and (9) Characteristics of information and sources. However, this model is not literal combination of models, it is new synthesis of elements founds in the various models. This model is in the flow chart, however, some of the terms are not fully defined.

B. Information Needs Of The International Students

Literature of ISB models showed that information need is an important factor through which a person starts to find the information. The information needs of the international students from the studies of (Alemu & Cordier, 2017; Hamid et al., 2016) are shown in Table 1.

Table 1. Information needs of international students (Alemu & Cordier, 2017; Hamid et al., 2016)

Categories of information needs	Specific information needs
Academic	Academic adjustment, academic performance, international service program, academic difficulties, adapting to academic work, future career adapting, method of teaching problems, admissions and selection, orientation services, student activities, academic life, living on or off campus, transportation, visa, courses and education.
Financial	Financial constraint, fee, financial aid, part-time job, lacks adequate research support and scholarship.
Socio-cultural	Personal adjustment, social adjustment, religion differences, cultural adjustment, relationship of international students and teachers, food, lifestyle, language barrier, English difficulties, loneliness, acculturation stress, friendship, interaction with the foreign students and understanding the language, culture sphere, difficulties at public services.
Health	Health insurance, climate, health services, living services.

Hamid et al. (2016) conducted the systematic literature review and identified the broad information needs which categorized into four main information needs as summarised into Table 1. Whereas, to fulfil the information need a platform such as search engines, social media and face-to-face interactions needed through which a person get the information, which is explained in the next section.

C. Information-Seeking Platforms For The International Students

The literature review identified the three main information-seeking platforms commonly used by the international students to get the information (Chung & Yoon, 2015; Hamid & Bukhari, 2015; Jungwon Yoon & Chung, 2017). They are: search engines, social media, and face-to-face interactions.

a) Search engines

Search engines like Google, and electronic libraries are helpful to find the general information (Purcell, Brenner, & Rainie, 2012). International students searched the health, academic, country and university information through the search engines (Cerretani, Iturrioz, & Garay, 2016; Sin, 2015; JungWon Yoon & Kim, 2014). However, the main difficulties of search engine is it hard to find accurate information due to information overload information and at times, out-of-date information (Lee & Oh, 2013). According to Yoon and Chung (2017), international students faced barriers in the use of the search engine such as lack of multiple language interfaces, poor searching skills and limited vocabulary, information clutter and low relevance of results. Moreover, people first go to the search engine to search the general information, but for specific opinions or recommendations, they tend to use the social media (Morris, Teevan, & Panovich, 2010). This shows that for the general information, search engine is the best information-seeking medium but for a more specific type of information, international students would turn to social media (Morrison, 2015; Quinn, 2016).

b) Social media

Social media is an instantaneous source and important part of modern lifestyle (N. B. Ellison, Steinfield, & Lampe, 2011). It helps the students to enhance learning during the interaction with the others (Tess, 2013). Social network sites (SNSs) like Facebook, Instagram or Twitter help the international students to seek health, culture, country and academic information (Cerretani et al., 2016; Nicole B. Ellison, Steinfield, & Lampe, 2007; Reaves & Bianchi, 2013). International students used the social m-edia in addressing everyday challenges (Vrocharidou & Efthymiou, 2012).

However, Sin (2015) argued that it is harder for international students to find legal, financial, personal and cultural based information on social media compared to academic-related information (Sin 2015). On social media, international students interact with the international students, local students, faculty, and also their family and friends to get the information, to develop confidence and overcome home sickness (Bae, 2018; Garrett & Cutting, 2012; Jungwon Yoon & Chung, 2017). In this aspect, social media is seen as a more important and personal platform for the international students as compared to search engines (Hamid et al. 2016).

c) Face-to-face interaction

Face-to-face interaction is another way used by the international students to interact with the local students, faculty and other international students (Hamid & Bukhari, 2015; Leask, 2009). When international students interact with the local students then they learn culture of each other and build relationship (Rienties & Nolan, 2013). In addition, those international students that have more local friends adjust better compared to those who do not have local friends (Hendrickson, Rosen, & Aune, 2011). This shows that interaction with the local friends helped the international students to overcome the challenges and better their understanding of the host country in terms of language, culture and customs (Yeh & Inose, 2003). However, there limitation of face-to-face is that it requires physical interaction to make it more effective.

III METHODOLOGY

In information-seeking activities, when a person interact with the formal or informal sources is called ISB (Wilson, 1997). Literature showed that search engine has a limitation to provide the updated, specific and opinion-based information. Face-to-face interaction has a limitation to get the information as it requires physical interaction which is impossible when students are not immersing well with the local people. Hence, the most useful source of information for the international students is social media. However, we need to understand the activities performed by international students when they interact with the other students to fulfil the information needs on social media (Hamid et al., 2016). For this, we employ netnography approach as it is able to determine the information being exchanged between two or more individuals (Quinton & Wilson, 2016) and literature review to propose the model.

For netnography, after considering several network sites, the "*main discussion group of international students from the public university of Malaysia*" has

been selected to conduct the netnography. While, the researcher joined the Facebook Group and communicate with the admin on Facebook to get permission, cooperation from group members, and to ensure the research objectives are met.

The data was downloaded on 5 September 2015 using NodeXL tool and get the posts, comments and likes based on the relationship between international students. Reason of using the NodeXL because it provides more user friendly built-in function of Microsoft Excel as compared to other tools (Hansen, Shneiderman, & Marc.A, 2011; Love, Himelboim, Holton, & Stewart, 2013) . Out of 3622 international students (also called stakeholders) in 2015, a total 1327 vertices got from the downloaded data. However, after cleaning the data (removed unnecessary attributes and incomplete data) remained vertices were 1210. This shows user rare actively used the Facebook, but data (posts and comments) fulfil the research objectives. For ethics purpose, we used the anonymous names of Facebook group and named of all vertices.

Vertex represents one person (international student/stakeholder) and when two or more vertices communicate based on the comment or post, then made the edge. From the data (posts and their comments) identified the information that international students exchanged during the communication. To analyse the posts and comments a thematic coding was applied. Thematic coding is used to identify key topics across textual data, and this process is flexible to use (Braun & Clarke, 2006; Creswell, 2013). The analytic process of coding generally includes a careful reading of transcripts (posts and their comments), noting and comparing themes for coding and transforming the identified codes into categories (Braun & Clarke, 2006).

Thematic coding was performed by (SB) and then reviewed and refined by (SH, SD) following the main guidelines in (Creswell, 2013) and (Denzin & Lincoln, 2011). All posts and comments were printed and read multiple times. Notes were also taken. Text segments were provided with codes, and the same codes were grouped under a main theme. Coding was performed on the data until data saturation was achieved, and no new post or comment presented new coding. After identifying the themes, the analysts went back to the posts and comments and selected the best example for each theme. Moreover, further analysis clarified the specific nature of each theme, which changed from initial descriptive themes to conceptual ones. Two main themes were defined as information needs and information source, which have sub-themes on

Facebook Groups and explained in the results section.

IV RESULT

The downloaded data contain vertices and edges (i.e. connection between vertices) in MS Excel sheets. While from the Excel sheet (of both posts and comments) found the information need and information source that international students used on Facebook groups.

A. Information Needs

Posts or comments contain words such as 'can', 'help', 'anybody' and 'urgent'. The data found three main types of information needs: 1) education, 2) university, and 3) accommodation. These information needs have the same concept as found from the literature review. While to fulfil the information needs, other international students provide the source.

B. Information Source

A stakeholder (international students) provides answers to information needs or important information about the education, university and accommodation for international students in a post or comment.

Some of the examples of the post/comments related to the information needs and information source are as follow.

Table 2. Example Of Posts/Comments For Information Need And Information Source.

Main theme	Sub-themes	Example of posts/comments
Information needs	Education	*Hi everyone, anyone knows the Bahasa Malaya subject code? Thanks (1)* *Hello, my dear friends. I need help from all of you. Please help me complete this questionnaire. It takes 5 minutes at most and it's beneficial for all international students. The objective of this survey is to explore international students' perception on costs of living in UM. Your help means a lot. I need at least 300 samples because UM has 3,284 international students, including 847 international undergraduates and 2,387 postgraduates. Thank you!(2)*
	University	*Dear friends. I am currently studying bachelor of marketing management at Universiti Teknologi Malaysia in English. I would like to know if I apply for a master's degree at UM, do I still need IELTS?(3)* *Hello everyone! I'm an engineering student from Canada. I will take part of the student exchange program during Session 2 (intake in February 2016).(4)*
	Accommodation	*"Hi everyone, I am coming this February to the University Malaya. Please suggest a good place for me to stay on-campus or off-campus. I do not have any idea how the university hostels on campus are. Thanks!(5)*
Information source	Education	*Bahasa Malaysia As as Course (TXGZ6102).(6)* *Dear friends, thanks for your help. I got 100 samples already, but I still need 200 samples. Please help me publicise my survey on your Facebook page. I wish to thank you again! (7)*
	University	*Yes... you can also take the course here, but better to sit IELTS or TOEFL.(8)* For the student exchange query, one stakeholder responded: *I guess you can refer to Ms. Wang Sok Wai.(9)* Another answered, *May be the limited quota is full! (10)*
	Accommodation	*Talk to this guy Aslam... he is looking for a housemate. (11)*

V DISCUSSION

The netnography found that the international students interact with other international students on social media to ask the queries (information needs) related to education, university and accommodation. Which is further divided into sub-category. Whereas, for information needs of education, university and accommodation, other international students provide the website/link, suggestions and contact of person (information source). This shows that on social media, international students get the specific opinion and information to fulfil the information needs. However, literature review showed international students need the search engine to get the general information about academic, health and country information called the informal searching (Choo & Marton, 2003).

Netnography showed for the specific information, international students need the other international students that have the experience of living abroad and know the process (registration, visa) in university. This activity is called interacting. Interaction can be done by face-to-face but it needs physical interaction. This finding matched with Morris et al. (2010) that for initial search tasks, people may want to take the first step on the search engine, and then move to the social network, particularly when opinions or recommendations are required. In addition, international students followed

the websites and links of universities and countries to get the up-to-date information called following. Interacting and following are bi-directional because sometimes international students interact then follow and sometimes they follow and then interact. In interacting and following, international students not only need the information but also verified the lots of the information such as visa, registration and so on that cannot get from the search engines. This activity called verifying. On this basis, evaluate the information-seeking activities as informal searching, interacting, following, and verifying using platform as summarized in Table 3. Findings of the netnography data and literature review proposed the model of ISB of the international students using social media and shown in Figure 1. Social media is dominant as compared to other platforms (search engine and face-to-face). In future, we will conduct interviews with the international students as to understand the underlying information-seeking activities using social media and eventually validate the proposed model.

Table 3. Information-Seeking Behaviour Of The International Students From Netnography And Literature Review

| Activity	Platform	Purpose
Informal searching	Search engine	International students search the general information on search engine.
Interacting	Social media/ Face-to-face	International students interact with other international students to ask the queries.
Following	Social media	International students like the pages of social media and joined the group to get the information.
Verifying	Social media/ Face-to-Face	International students verify the information from the other international students.
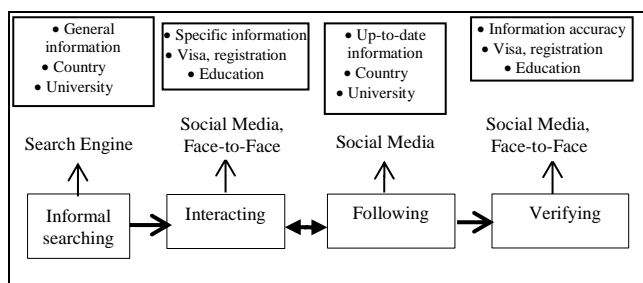
Figure 1. Proposed Model Of Information-Seeking Behaviour Of The International Students Using Social Media

VI   CONCLUSION

This paper describes the need of ISB model for the international student's use of social media. As previous literature of ISB models focused on the physical libraries (which has limitation in providing the information) to the international students in new environment, there is a need to conduct the study of ISB of international students in their use of social media and Internet for information seeking. As ISB derived from the information needs, so found the information needs of the international students from the literature review, which later helped to categorize the Facebook data (posts and comments). While, to fulfil the information need, international students needed a platform through which a person get the information. The literature identified the three platforms for international students as search engines, social media and face-to-face interaction to get the information. We conducted the netnography and evaluated the information-seeking activities that international students performed on social media, and proposed the model of ISB of international students using social media as shown in Figure 1. Most of the previous models are based on libraries and cover subjects other than the information needs of international students. This research theoretically enhances the previous model of ISB by adding the role of social media. By identifying the information needs of international students and examining the role of social media in supporting ISB, this work provides comprehensive services and references for international students, universities and higher-education institutions.

Else this implication, this study has some limitation. As lack of empirical study with the international students to validate the model. Future research will consider these limitations.

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