Exploring Student Learning of Information Skills in Malaysian Higher Education

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ATTESTATION OF AUTHORSHIP

"I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning."

Aidah Abdul Karim: *Aidah*

Date: 26/03/2015

ABSTRACT

In line with the Malaysian Qualification Framework, student learning of information skills in Malaysian higher education is currently integrated into classroom learning as opposed to previous stand-alone programmes run by the university library. However, Malaysian research indicates that there is an on-going ambiguity with regard to the outcomes of the student learning of information skills in Malaysian universities that seems to suggest there is a conflict between the student learning run in the universities and the western standards for information skills in higher education. Moreover, previous Malaysian studies revealed that the Malaysian cultural context had led to different social roles of teachers, librarians and students which adversely influenced student learning. On the other hand, previous studies indicated that student learning of information skills is influenced by the various personal attributes of university teachers, librarians and students. Therefore, in order to understand student learning of information skills in the context of Malaysian higher education, there is a need to examine the interplay of social and personal factors in the outcomes of student learning of information skills in the light of the unique social and personal influencing factors in Malaysian higher education rather than assuming that western information skills standards are effective and desirable in every context.

Thus, the purpose of this study is to examine student learning of information skills as experienced and perceived by Malaysian university teachers, librarians and students engaged in student information skills programmes. Using the lens of communities of practice to guide the design of the study, this study explores: (1) features of student learning of information skills; (2) the interplay of social factor in student learning of information; and (3) the interplay of personal and interpersonal factors in student learning of information skills. This study employed a qualitative research design that involved five teachers, four librarians and 22 students in a Malaysian public university and incorporated several methods of data collection: observation of student information skills programmes; examination of documents related to the programmes; and semi-

structured interviews with the teachers, librarians and students involved in the programmes.

The major findings of the study are: (1) Student learning of information skills was about engaging students in knowledge-building activity instead of student learning about information-related skills as was originally assumed; (2) The outcome of the knowledge-building activity was students' creation of new public knowledge and its mediating artefacts instead of their acquisition of a set of predetermined information-related skills as assumed at the beginning of the study; (3) Classroom learning emerged as the immediate context for the knowledge-building activity instead of the community of student learning of information skills as was assumed at the study's inception; (4) Through participating in the activity of student learning with information, students engaged in the processes for becoming knowledge creators rather than in a socialization process (becoming full members of the community of student learning of information skills) as was initially assumed; (5) There were multiple influencing factors for students' engagement in the development processes that were interrelated reciprocally with each other—personal, immediate and multiple external contexts, indicating that the proximal development processes operated within a nested or ecological learning system. In this sense, the findings differed from the original framework that assumed an independent interrelationship between personal, interpersonal and social influencing factors for student learning of information skills.

The findings of my research result in an understanding of the processes for developing students into knowledge creators within a nested or ecological system of higher learning and further locating student learning of information skills in the development processes from the viewpoints of Malaysian university teachers, librarians and students who engaged in student information skills programmes, distinguishing the student learning of information skills in other regional or institutional contexts. The research generates possible significant insights for other institutions of learning in Asian countries into developing and integrating student learning of information skills across classroom learning in order to support the processes for developing students

into knowledge creators. The findings of this study suggest various communities in higher education—teachers, librarians and students—should be more aware of the role of knowledge-building activities in classroom learning for developing students into knowledge creators. Moreover, they should consider the reciprocal interaction between the multiple layers of higher learning systems in which the development processes operate in order to collaboratively and dialogically create classroom learning that facilitates these development processes.

CHAPTER 1: INTRODUCTION

1.1 Overview

Numerous studies have examined the individual perspectives of university teachers, librarians or students with regard to their experiences and perceptions of student learning of information skills. However, there is a lack of empirical studies that explain how student learning of information skills takes place when a group of teachers, librarians and students engage in student information skills programmes. Guided by the communities of practice lens, this study examined student learning of information skills as experienced and perceived by this group of people who engaged in student information skills programmes in Malaysia. Following the theoretical framework, this study employed a qualitative research design to investigate both the experiences and perceptions of student learning of information skills of this group who engaged in student information skills programmes in a Malaysian public university. Data were collected via observing student information skills programmes, examining course-related materials, and interviewing classroom teachers, librarians, and students involved in the programmes. This chapter explains the background origin, a statement of the problem, the purpose, research questions, theoretical framework and approach of the study, as well as the structure of the thesis report.

1.2 Background of the Study

Information skills have been generally defined as the set of abilities that enable students to identify the need to engage with information sources; to search, evaluate, analyze and synthesize information from multiple sources; to use the synthesis to accomplish specific goals; and to communicate the accomplishment of the goals and the process involved (American Library Association, 1989; Association of College and Research Libraries, 2000; Bundy, 2004; Society of College National & University Libraries, 1999). UNESCO (2006) further identified the skills as an extension to the reading and arithmetic abilities necessary for individuals and their communities to function and progress, while others (e.g., Amstutz & Whitson, 1997; Andretta, 2005; Bundy, 2004)

associated the skills with the attributes of 21st century higher education students and as a foundation for lifelong learning.

In Malaysia, student information skills programmes have been operating in higher education since the 1990s when the government called for higher education institutions to develop knowledge workers for the local knowledge economy. Defined as those who are able to use information technology fluently, knowledge workers must be able to access, use, synthesize and construct information (Economic Planning Unit, 2006). Following this requirement, the institutions' academic libraries offered information skills programs to students in order to transform university graduates into knowledge workers. The introduction of the Malaysian Qualification Framework (Malaysian Qualifications Agency, 2007) into the national education system in the mid-2000s further reinforced students' acquisition of information skills in higher education. The framework highlighted that information skills constitute a series of desirable learning outcomes that higher education students should acquire and demonstrate before they are able to graduate from their institution of learning. The framework also shifted student learning of information skills beyond the boundary of academic libraries and into classroom learning.

1.3 Origin of the Study

I was trained as a professional librarian in the discipline of librarianship and information science, and had worked in a library for the blind before joining a Malaysian university as an instructor in the field of educational technology. Following my professional training, I considered that librarians play a major role in facilitating higher education students to become information literate. In that light, I believed that Information Literacy Standards for Higher Education (Association of College and Research Libraries, 2000) and its derivatives (e.g., Bundy, 2004; Council of Australian University Librarians, 2001) provided a framework for librarians to identify information-related skills that are needed by higher education students, and develop suitable information skills programmes to help students acquire those skills. Accordingly, I assumed that, after students participated in information skills programmes run by librarians, they would acquire, and later demonstrate, information skills across their classroom learning.

With that in mind, I worked collaboratively with librarians in the university to integrate information skills programmes within my classroom learning. Following Harris and

Millet (2006), Larkin and Pines (2005) and C. Bruce (2001b) who say an independent learning approach would help students to apply and demonstrate their information skills, I designed classroom assignments that require students to independently search, read, analyze and synthesize information from multiple sources related to their classroom topics. By doing that, I expected students would produce classroom assignments that demonstrated their information-related skills. However, that expectation was not fulfilled; most of my students were still unable and unwilling to search information from multiple and recent sources for their assignments, while a few others copied their seniors' work. Disturbed and disappointed by this observation, my colleagues and I conducted an exploratory survey on information skills' usage among undergraduate students in our department (Karim, Din, & Osman, 2004).

The survey findings reinforced my earlier observation and led me to develop a few questions about student learning of information skills such as: "What actually is student learning of information skills?"; "What is involved in the student learning; and "What facilitates and inhibits the student learning?" Based on my experience as a student, librarian and teacher, I further assumed that students' difficulty might not have much to do with the learning but more with applying information skills because the latter requires them to perform a series of information-related behaviors that might challenge their current ways of accessing and using information and its sources. Moreover, there may be various social factors that directly or indirectly inhibit students to demonstrate information skills across their classroom learning. With these questions and assumptions, I began my journey of investigating students' learning information skills in the place where it all began, at my own university, one of the public universities in Malaysia.

1.4 Statement of the Problem

Although Malaysian public universities have been conducting various types of student information skills programmes, a review of the literature (e.g., Chan, 2003; Edzan & Mohd Saad, 2005; Mohd Saad & Awang Ngah, 2002) found that these programmes focused on limited aspects of information skills: namely searching information and its sources. Similarly, Karelse (1998) and Reid (1998) were of the view that student information skills programmes in Malaysian higher education generally emphasized computer use to search and access information and its sources, and overlooked other aspects of information skills, namely information analysis and synthesis. Such views

suggested that, in terms of student learning outcomes there is a discrepancy between student information skills programmes run by higher education institution in Malaysia and the established information skills standards for higher education (e.g., Association of College and Research Libraries, 2000; Bundy, 2004; Joint Information Systems Committee, 2002). Although a few studies had examined student learning of information skills in Malaysian higher education (e.g., S. Abdullah, Ahmad Kassim, Mohd Saad, Tarmuchi, & Aripin, 2006; Edzan, 2007), most of the studies had focused on quantifying the level of students' information skills. While these findings were helpful to estimate the level of information skills acquired by Malaysian university students, they were insufficient to explain the discrepancy observed within student information skills programmes.

Existing literature further suggested that student learning of information skills is a social phenomenon (e.g., Simmons, 2007). Likewise, a few studies had found that student learning of information skills in Malaysian universities was influenced by classroom practice (Chan, 2003) and social culture (Badger & Roberts, 2005). On the other hand, literature also identified that personal and interpersonal factors such as personal conception and experience of, and interaction between higher education teachers, librarians, and students could influence student learning of information skills (e.g., Boon, Johnston, & Webber, 2007; C. Bruce, 1997; Floyd, Colvin, & Bodur, 2008; Kearns & Rinehart, 2011; Kuhlthau, 2004; Lupton, 2003; Yoon, 2007). While social, personal and interpersonal influencing factors for student learning of information skills are still undergoing investigation in Malaysia and worldwide, studies that examine the interaction between the social, personal and interpersonal factors and its interplay in the student learning of information skills have yet to be thoroughly researched.

The purpose of the study is to examine student learning of information skills as experienced and perceived by university teachers, librarians and students in Malaysia. This study explored the interaction of social, personal and interpersonal factors in student learning of information skills in higher education by examining the experiences and perceptions of student learning of information skills of university teachers, librarians and students in Malaysia. While this study is vital for opening another door for researchers and practitioners to deepen their understanding and improve their practice with regard to student learning of information skills in higher education

respectively, this study also corresponds very well with the requirements of the Malaysian Qualification Framework (2007) that shift the student learning of information skills from the library to the classroom context.

1.5 Theoretical Framework and Approach of the Study

I used the lens of communities of practice (Wenger, 1998) to inform the research approach and design of the study. Wenger (1998) described communities of practice as "a group of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis" (Wenger, McDermott, & Synder, 2002, p. 4). Using this perspective, I assumed that student learning of information skills in universities is located within a community of practice for student learning of information skills that would be developed when a group of university teachers, librarians and students consciously and collaboratively participate in student information skills programmes. Aided by the expert members of the community (i.e., the university teachers and librarians), the university students would participate in the community, and thus developing a progressive movement from peripheral to full participation and from novice to expert in information skills within the community.

Additionally, through the notion of nexus membership within the communities of practice, I also assumed that this group are existing members of various communities within their institutions of learning. In this sense, an investigation of the interplay of multiple memberships within the community of student learning of information skills would provide a new insight of student learning of information skills in the university context. On the other hand, members of the community of student learning of information skills are also human beings with unique ways of thinking, feeling and doing. In this regard, the lens of communities of practice suggested that, in addition to social and interpersonal factors, an examination of the interplay of personal factors on student learning of information skills might lead to a deeper and holistic understanding of student learning of information skills in higher education.

Following the lens of communities of practice approach, I identified that the unit analysis of the study is student information skills programmes that involve university teachers, librarians and students. Accordingly, to investigate student learning of information skills as experienced by these people who had engaged in student

information skills programmes in Malaysia, I employed interpretive and constructivist positions to understand and gain knowledge about the reality under study. Following these positions, I employed a qualitative research design to investigate the reality of student learning of information skills in a public university in Malaysia.

1.6 Research Questions

Guided by the lens of communities of practice, I developed five research questions to assist my investigation and understanding of student learning of information skills in a public university in Malaysia. The questions were:

1. How do university teachers, librarians and students who engage in student information skills programmes in a Malaysian public university experience and perceive student learning of information skills?

2. What is the immediate context for student learning of information skills as experienced and perceived by the university teachers, librarians and students?

3. How do the university teachers, librarians and students experience and perceive the interplay of interpersonal factors in student learning of information skills?

4. How do the university teachers, librarians and students experience and perceive the interplay of social factors in student learning of information skills?

5. How do the university teachers, librarians and students experience and perceive the interplay of personal factors in student learning of information skills?

1.7 Structure of the Thesis

This thesis consists of eleven chapters:

- Chapter 1, 'Introduction', explains the research background, origin, statement of the problem, purpose, theoretical framework and question of the study, as well as providing an outline for the thesis report.

- Chapter 2, 'The Context of the Study', provides the space, temporal and cultural context of the study. The chapter explains the geography and history, population and politics, economy, culture, and higher learning orientation in Malaysia. The chapter also discusses the development and types of public universities in Malaysia, and their graduate employability and student information skills programs.

- Chapter 3, 'Student Learning of Information Skills in Higher Education', reviews related literature on the development and definition of information skills, and outcomes, enablers, learning theories, approaches, assessment, social factors and personal factors for student learning of information skills in higher education.

- Chapter 4, 'Research Theoretical Framework', locates the study within information skills studies and explains the theoretical framework of the study that guided the development of the study's research questions and design.

- Chapter 5, 'Research Design and Implementation', explains the theoretical and practical components of the research design and implementation that have been employed by the study to answer the research questions including the research philosophy, approach, design, setting, participants, methods, data analysis and quality of the study.

- Chapter 6, 'The Activity of Student Learning with Information', discusses features of student learning of information skills as experienced and perceived by university teachers, librarians and students who engaged in student information skills programmes in a Malaysian public university and how they engaged with the features.

- Chapter 7, 'Immediate and Interpersonal Contexts for the Activity of Student Learning with Information', discusses three features of the classroom context that emerged in the study as the immediate context for the activity of student learning with information. Also discussed are the multiple interpersonal contexts that influenced the activity of student learning with information as experienced and perceived by the group under study.

- Chapter 8, 'Social Contexts for the Activity of Student Learning with Information', discusses multiple social contexts that both formed and informed the features of the activity of student learning with information as experienced and perceived by university teachers, librarians and students who engaged in student information skills programmes in a Malaysian public university.

- Chapter 9, 'Personal Contexts for the Activity of Student Learning with Information', discusses the multiple personal contexts that influenced student engagement in the activity of student learning with information as experienced and perceived by university teachers, librarians and students who engaged in student information skills programmes in a Malaysian public university.

- Chapter 10, 'Summary, Conclusion, Implications and Future Research', summarizes the key findings of this study and explains how these confirm and extend the literature on student learning of information skills. This chapter also discusses the implications and limitations of the study, and provides suggestions for future research.

CHAPTER 2: THE CONTEXT OF THE STUDY

2.1 Overview

This chapter provides information on the space, temporal and cultural context of the study which includes the geography, history and politics, and economy in Malaysia. The chapter also explains the development and types of public universities in Malaysia and the graduate employability of the universities. This chapter also discusses information skills programmes within the universities and highlights cultural and learning orientation in Malaysia that might influence student learning of information skills within the universities.

2.2 Geography of Malaysia

Malaysia is geographically located just north of the equator in Southern Asia and shares maritime boundaries with Indonesia, Singapore and the Philippines. As can be seen in Figure 1, the country consists of West Malaysia (Peninsula of Malaysia) that encompasses an area of 131,794 square km, and East Malaysia that covers an area of 198,000 square km. Both Peninsular and East Malaysia consist of rugged forested mountainous interiors descending to coastal plains, with the highest peak, Mount Kinabalu at 4,100 m, located in East Malaysia. The capital city is Kuala Lumpur which is situated at the heart of Peninsular Malaysia. Malaysia enjoys a hot tropical climate (up to 34°C) and humid weather (2 to 4 m of rain) annually that come with southwest (April to October) and northeast (October to February) monsoon winds respectively.

Malaysia's population reached 28.25 million as of July 2010, consisting of Malays (55 per cent), Chinese (24.4 per cent), indigenous groups (11.9 per cent), Indians (7.4 per cent), and other ethnicities (1.3 per cent). Sunni Islam is the predominant religion in Malaysia, but a wide range of religions is also practised, including Christianity, Buddhism, Hinduism, and others. The official language of Malaysia is the Malaysian language but English is widely used, and there is a range of Chinese and Tamil dialects that are used within their respective communities. As each ethnic group in Malaysia has

its own culture and language, I expected in this study that students' learning in Malaysian higher education could be identified with their ethnic group.

Figure 1: A map of Malaysia that shows the country's location, neighbouring countries and major cities. Source: Nationsonline.org (1998-2014).

2.3 History and Politics of Malaysia

Originally known as Tanah Melayu (The Malay Soil), Malaysia was occupied by the Dutch, Portuguese, and Great Britain during the late 18th and 19th centuries. During its occupation, the British brought Chinese and Indian people from Mainland China and India to work in the iron and tin mines, and rubber plantations respectively in Tanah Melayu. The country was also occupied by Japan from 1942 to 1945 during the Second World War while a colony of Great Britain. In 1948, the British-ruled territories on the Malay Peninsula formed the Federation of Malaya, which became independent in 1957. Politically, the Federation of Malaya was established on the 16th September 1963 when the Federation was joined by the states of Singapore, Sabah (formerly British North Borneo), and Sarawak and the name 'Malaysia' was adopted from that date. The first several years of the country's history observed Indonesia making an attempt to control Malaysia, the Philippines claiming Sabah as their territory, and Singapore leaving Malaysia in 1965.

Malaysia is a federal constitutional monarchy and a parliamentary democracy. The Malaysian Constitution provides that Islam is the religion of the federation but all other religions may be practiced in peace and harmony. The Head of State is the Yang di-

Pertuan Agong (King) while the Head of Government is the Prime Minister, who is also the head of the Cabinet. Malaysia consists of 13 states: Johor, Kedah, Kelantan, Melaka, Negeri Sembilan, Pahang, Perak, Perlis, Pulau Pinang, Sabah, Sarawak, Selangor, and Terengganu. There are also three Federal Territories: Labuan, Putrajaya and the country's capital city, Kuala Lumpur. Nine of the 13 states have hereditary rulers (eight Sultans and one Rajah) who share the position of 'King' on a five-year rotating basis. Malaysia's legislative power is divided between federal and state legislatures. The Federal Parliament comprises the House of Representatives (Dewan Rakyat) and the Senate (Dewan Negara). The House of Representatives has 222 members elected for five-year terms in single-seat constituencies. The Senate consists of 26 members who are elected by State Legislative Assemblies, and 44 members who are appointed by the King on the advice of the Prime Minister. The tenure of office is a three-year term for a maximum of two terms. States have their own elected Legislative Assemblies. Federal and state elections are held concurrently, with the exception of state elections in Sarawak which are held separately.

Presently, the governing Barisan Nasional (National Front) coalition comprises the United Malays National Organisation (UMNO), the Malaysian Chinese Association, the Malaysian Indian Congress, plus a number of other parties including some based in East Malaysia. This coalition, in which UMNO is the dominant voice, has been in power at the federal level in one form or another since the first elected government in 1955. However, current opposition parties in Malaysia such as PKR (Justice for People Party) and PAS (Islamic Movement Party) hold state legislative power in the states of Selangor, Kelantan, and Perlis. Due to slow changes in the Malaysian political landscape, I expected that slow changes also to be seen in teaching and learning practices in Malaysian higher education—particularly at the older universities in the country.

2.4 Economy of Malaysia

Malaysia is a middle-income country that has transformed itself from what it was in the year 1971 through the late 1990s, from being a producer of raw materials such as rubber and palm oil, into an emerging multi-sector economy. It is only recently that Malaysia has refocused on the agricultural sector due to the economic recession that hit the industrial and manufacturing sectors. The economic transformation is designed to sustain the economic growth essential to transform Malaysia into a fully developed

nation by the year 2020. A brainchild of the former Prime Minister Malaysia, Tan Sri Dato' Dr Mahathir Mohamad, the Vision 2020 defines the term 'a fully developed nation' as follows:

> *By the year 2020, Malaysia can be a united nation, with a confident Malaysian society, infused by strong moral and ethical values, living in a society that is democratic, liberal and tolerant, caring, economically just and equitable, progressive, and prosperous, and in full possession of an economy that is competitive, dynamic, robust and resilient.*
> (Mohamad, 1991, p. 2)

Mahathir Mohamad further outlined nine challenges that Malaysians as a nation must overcome in order to become a fully developed nation as identified by Vision 2020 by the year 2020. These nine challenges are listed below:

1) Establishing a united Malaysian nation with a sense of common and shared destiny. This must be a nation at peace with itself, territorially and ethnically integrated, living in harmony, full and fair partnership, made up of one 'Bangsa Malaysia' with political loyalty, and dedication to the nation.

2) Creating a psychologically liberated, secure, and developed Malaysian Society with faith and confidence in itself, justifiably proud of what it is, of what it has accomplished, robust enough to face all manner of diversity. This Malaysian society must be distinguished by the pursuit of excellence, fully aware of all its potentials, psychologically subservient to none, and respected by people of other nations.

3) Fostering and developing a mature, democratic society, practising a form of mature consensual, community-oriented Malaysian democracy that can be a model for many developing countries.

4) Establishing a fully moral and ethical society, whose citizens are strong in religious and spiritual values and imbued with the highest of ethical standards.

5) Establishing a mature, liberal, and tolerant society in which Malaysians of all colours and creeds are free to practise and profess their custom, cultures, and religious beliefs, yet feeling that they belong to one nation.

6) Establishing a scientific and progressive society, a society that is innovative and forward-looking, one that is not only a consumer of technology but also a contributor to the scientific and technological civilization of the future.

7) Establishing a fully caring society and a caring culture, a social system in which society will come before self, in which the welfare of the people will revolve not

around the state or the individual but around a strong and resilient family system.

8) Ensuring an economically just society in which there is fair and equitable distribution of the wealth of the nation, and there is a full partnership in economic progress. Such a society cannot be in place so long as there is the identification of race with economic function, and the identification of economic backwardness with race.

9) Establishing a prosperous society, with an economy that is fully competitive, dynamic, robust, and resilient. (Sources: Mohamad, 1991, pp. 1-2)

To overcome all the nine challenges outlined by Vision 2020, Mohamad (1991) urged the nation to transform the activities-based economy into a knowledge-based economy. The new economy, which is underpinned by the generation and utilization of knowledge, requires special types of workers, known as knowledge workers, who are able to create, innovate, generate, and exploit new ideas by applying technology and exercise superior entrepreneurial skills, and acquiring, applying, synthesizing, and creating knowledge (Economic Planning Unit, 2001, 2002, 2006). Based on the Knowledge-Based Economy Master Plan (2002), the Multimedia Development Corporation (MDeC), a corporation established by the government to manage projects in Malaysian Multimedia Super Corridor (MSC Malaysia)—a special economic zone in Malaysia, defined "a knowledge worker" as:

> *"...an individual who possesses one of these qualifications: five or more years' professional experience in multimedia/information and communication technology (ICT) business or in a field that is a heavy user of multimedia; a university degree (in any discipline) or a graduate diploma (multimedia/ICT) from a professional experience in multimedia, and a master degree or higher in any discipline".* (Knowledge-Based Economy Master Plan, KEMP, 2002, p. 43)

While information technology is assumed as the primary enabler for the development and running of the knowledge economy as reflected in the development of the Malaysian National Information Technology Agenda (NITA) and Malaysian Multimedia Super Corridor (MSC Malaysia), the development of knowledge workers is considered the key to running the economy. Once the terms of reference for the Malaysian knowledge economy were in place, the Eighth Malaysian Plan (Economic Planning Unit, 2001) and the Ninth Malaysian Plan (Economic Planning Unit, 2006) focused heavily on the development of information technology infrastructure and the

training of human capital to develop knowledge workers. Accordingly, during the Third Outline Perspective Plan (OPP3) period), the government placed high importance on the areas of 1) human resource development (HRD), 2) science and technology (S&T), 3) research and development (R&D), and 4) information structure and financing (Economic Planning Unit, 2006).

The current government still uses Vision 2020 as the yardstick to benchmark Malaysian economic and social performance. Within the current unstable global economy, Malaysia continues to face the nine challenges outlined in Vision 2020 via developing the four key areas identified earlier. As 2020 is approaching, I expected in this study that student learning in Malaysian higher education would support the development of these four key areas, such as assisting university students to become knowledge workers, to use information communication and technology, and conduct quality research in order to generate new knowledge, innovation and wealth as required by the knowledge economy.

2.5 The Development of Public Universities in Malaysia

The public universities' missions and policies are designed to support the national education philosophy that aims to develop Malaysia as a fully developed country in every aspect—economic, politics, social, spiritual, physical. This is reflected in the philosophy described below:

> *Education in Malaysia is an ongoing effort towards further developing the potential of individuals in a holistic and integrated manner so as to produce individuals who are intellectually, spiritually, emotionally, and physically balanced and harmonious, based on a firm belief in and devotion to God. Such an effort is designed to produce Malaysian citizens who are knowledgeable and competent, who possess high moral standards, and who are responsible and capable of achieving a high level of personal well-being as well as being able to contribute to the betterment of the family, the society and the nation at large.*
> (The Commissioner of Law Revision Malaysia, 2006, p. 11)

In support of Vision 2020, the Malaysian Education Act 1996 (The Commissioner of Law Revision Malaysia, 2006) made a requirement for education institutions in Malaysia, including public universities, to acknowledge that "knowledge is the key determinant of the destiny and survival of the nation" and "education plays a vital role in achieving the country's vision of attaining the status of a fully developed nation in terms of economic development, social justice, and spiritual, moral and ethical strength, towards creating a society that is united, democratic, liberal and dynamic" (p. 11). As a

result, universities are now required to offer education that "enables the Malaysian society to have a command of knowledge, skills, and values necessary in a world that is highly competitive and globalised, arising from the impact of rapid development in science, technology, and information" in order to "develop a world-class quality education system which will realize the full potential of the individual and fulfill the aspiration of the Malaysian nation" (The Commissioner of Law Revision Malaysia, 2006, p. 11).

The public universities' missions and policies are also designed to support the national education philosophy that aims to develop Malaysia as a fully developed country in every aspect—economic, politics, social, spiritual, physical. This is reflected in the philosophy described below:

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> (The Commissioner of Law Revision Malaysia, 2006, p. 11)

Historically, the development of Malaysian public universities began after Malaysia gained independence from the British in 1957 when a branch of the University of Malaya in Singapore was established in Kuala Lumpur in 1958. In 1961, the branch was upgraded to become the first public university of Malaysia known as the University of Malaya (Ministry of Higher Education, 2011e), while its former parent-university became known as The University of Singapore. Subsequently, more public universities were established in Malaysia, starting with Universiti Sains Malaysia (Science University of Malaysia) which was established in Penang in 1969. Later, the University Kebangsaan Malaysia (National University of Malaysia) was established in 1970 to bridge the education and economy divide among Malays and Chinese after Malaysian independence. During this time, Universiti Kebangsaan Malaysia has become the first university in the country to use the Malay language as its medium of instruction.

After that, Universiti Pertanian Malaysia (Agricultural University of Malaysia) was established in 1971 when it was upgraded from an agricultural college, followed by the development of University Teknologi Malaysia (The Technology University of

Malaysia) in 1975. Later on, Universiti Islam Antarabangsa Malaysia (International Islamic University of Malaysia) was established in 1983; it became the first university in Malaysia to provide an international learning experience to Malaysian and foreign students. This was closely followed by the development of Universiti Utara Malaysia (North University of Malaysia) in 1984. In the 1990s, the number of public universities in Malaysia increased tremendously with the establishment of Universiti of Sarawak (University of Sarawak) in 1992, Universiti Malaysia Sabah (Sabah University of Malaysia) in 1994, and Universiti Pendidikan Sultan Idris (Education University of Sultan Idris) in 1997. Beginning as the Rural Industrial Development Authority (RIDA) training centre in 1956, and later upgraded to Maktab Majlis Amanah Rakyat (MARA) or College of Malay for Indigenous People's Trust Council (MARA) in 1965 and Institut Teknologi Mara (MARA Institute of Technology) in 1967 respectively, Universiti Teknologi MARA (University of MARA of Technology) was finally established in 1999.

Presently, the Malaysian Ministry of Higher Education (2011d) currently lists about 20 public universities in Malaysia that provide certificate, diploma, bachelor degree, master degree, and doctorate programs to 437,420 Malaysian students (Ministry of Higher Education, 2011g) and 22,458 foreign students from Iran, Indonesia, China, Nigeria, Libya, Yemen, Sudan, Saudi Arabia, Iraq, Thailand, India, Maldives, Somalia and other countries (Ministry of Higher Education, 2011f). Supporting the Malaysian public universities are 390 private higher education institutions which consist of private universities, university colleges, foreign university branch campuses, and colleges (Ministry of Higher Education, 2011d) that offer certificate, diploma, bachelor degree, master degree, and doctorate programs to 484,377 Malaysian students (Ministry of Higher Education, 2011g) and 58,294 foreign students (Ministry of Higher Education, 2011f). Among foreign university branch campuses in Malaysia are Xiamen University Malaysia Campus, Raffles University Iskandar, Swinburne University of Technology Sarawak, Heriot-Watt University Malaysia Campus, University of Reading Malaysia, University of Southampton Malaysia Campus, University of Nottingham Malaysia Campus, Monash University Sunway Campus, Newcastle University Medicine Malaysia, and Curtin University Sarawak.

2. 6 Types of Public Universities in Malaysia

To develop a world-class quality higher education system in Malaysia, beginning 2007 onward, the Ministry of Higher Education has categorized Malaysian public universities into three main categories: research, comprehensive and focus universities (Ministry of Higher Education, 2011c) based on the focus and strength of the public universities. Table 1 shows that Malaysian public universities comprise five research universities, four comprehensive universities, and 11 focus universities (Ministry of Higher Education, 2011b).

Research universities

Starting in 11th October 2006, the government identified several public universities as research universities which would become the leading research and educational hub in the country (Ministry of Higher Education, 2011b). The objectives of research universities are to increase and strengthen the following areas:

- research and development and commercialization activities
- the intake of postgraduates and postdoctorate fellows
- the number of academic staff with PhD qualifications
- the intake of foreign students
- the international ranking of Malaysian universities' new and existing Centres of Excellence.

To assist in the attainment of the objectives, research universities focus on research-based fields of study, competitive entry requirements, quality lecturers, and a ratio of 50:50 of undergraduate to postgraduate student intakes. The selection of research universities is reviewed every five years, based on quantity and quality of researchers and research, postgraduate quantity and quality, innovation, professional services and awards, network and links, support facilities, as well as the universities' positions at the international level. Research universities must strive harder towards improving their ranking amongst the leading universities of the world as set out in the *Times Higher Education Supplement* (THES). This is also in line with the aim of the National Higher Education Strategic Plan to have at least three higher education institutions listed within the top 100 universities, and one among the top 50 universities in the world by 2020.

Table 1: Categories of public universities in Malaysia

Types of institutions	List of Public Higher Education Institutions	Number of Public Higher Education Institutions
Research University	Universiti Malaya (UM) Universiti Sains Malaysia (USM) Universiti Kebangsaan Malaysia (UKM) Universiti Putra Malaysia (UPM) Universiti Teknologi Malaysia (UTM)	5
Comprehensive University	Universiti Teknologi MARA (UiTM) Universiti Islam Antarabangsa Malaysia (UIAM) Universiti Malaysia Sabah (UMS) Universiti Malaysia Sarawak (UNIMAS)	4
Focus University	Universiti Utara Malaysia (UUM) Universiti Pendidikan Sultan Idris (UPSI) Universiti Tun Hussein Onn Malaysia (UTHM) Universiti Teknikal Malaysia Melaka (UTeM) Universiti Malaysia Perlis (UNIMAP) Universiti Malaysia Terengganu (UMT) Universiti Malaysia Pahang (UMP) Universiti Sains Islam Malaysia (USIM) Universiti Darul Iman Malaysia (UDM) Universiti Malaysia Kelantan (UMK) Universiti Pertahanan Nasional Malaysia (UPNM)	11

Sources: The Ministry of Higher Education, Malaysia (2011b, 2011d)

With a high volume of research fund given by the government and national acknowledgement awaiting the research universities, public universities in Malaysia compete with each other to become the best research university in the country and ranked highest in the world. At present, the 2013/2014 QS Asia University Rankings and World University Rankings (Top Universities.com, 2014) reported that Universiti Malaya was placed 33rd (Asia) and 167th (world), while Universiti Kebangsaan Malaysia was ranked 57th (Asia) and 269th (world). In the meantime, Universiti Sains Malaysia was placed 61st (Asia) and 355th (world), Universiti Teknologi Malaysia was ranked 68th (Asia) and 355th (world) and Universiti Putra Malaysia was placed 72nd (Asia) and 411th-420th (world). Quantity and quality of university research and publication have become the major criteria for becoming a research university in Malaysia. Hence, this study expected that there will be a high volume of undergraduate and postgraduate students' research and publication activities generated within public universities in Malaysia which would significantly increase the demand for student information skills programmes in the universities.

Comprehensive universities

Comprehensive universities are educational centres for pre-undergraduate, undergraduate, and postgraduate programs in various fields without focusing on any specific area. The government characterized comprehensive universities as universities

which have various areas of study, competitive intake, quality lecturers, and a ratio of 30:70 for undergraduate to postgraduate student enrolment (Ministry of Higher Education, 2011c).

Focus universities

The third category is focus universities, which refers to public universities which focus on specific fields, such as technical, education, management, and defense. The government characterizes focus universities as public universities with focused fields of study, competitive intakes, quality lecturers, and a ratio of 50:50 for undergraduate and postgraduate intakes (Ministry of Higher Education, 2011c).

2.7 The Graduate Employability of Malaysian Public Universities

To support the knowledge economy and higher education policy, and national education philosophy in Malaysia, government expects public universities to produce graduates across academic programs who are able to think critically, and who have excellent communication skills, fluency in English and also proficiency in computer technology (Ministry of Higher Education, 2011a). Such expectation is outlined in the Malaysian Qualification Framework (Malaysian Qualifications Agency, 2007) developed by the Ministry of Education that requires local graduates to increase their content knowledge and generic skills in order to boost their employability rates. According to the Malaysian Qualifications Agency (2007), the framework develops and classifies higher education qualifications based on a set of criteria that are approved nationally and benchmarked against international best practices. These criteria clarify the earned academic levels, learning outcomes of study areas and credit systems based on student academic load, and are accepted and used for all qualifications awarded by recognized higher education providers. By doing so, the framework provides educational pathways through which it links and unifies qualifications systematically, and in the context of lifelong learning, enables individuals to progress through credit transfers and accreditation of prior experiential learning.

As illustrated in Table 2, the framework requires students to, among other things, acquire and demonstrate a series of desirable learning outcomes across their university studies that encompass generic or soft skills. The Ministry believed that student demonstration of these skills would help local university graduates to become

competitive in the national and international job markets. These skills are aligned with knowledge workers' attributes i.e., fluency in information technology and the ability to generate innovation via accessing, using, synthesizing, and creating new knowledge (Economic Planning Unit, 2001, 2002, 2006).

Table 2: Student learning outcomes for various degrees in Malaysian higher education

Degrees	Students' outcomes/attributes
Bachelors degree	*Demonstrate knowledge and comprehension of fundamental principles of a field of study, acquired from advanced textbooks*; *Use the knowledge and comprehension* through methods that indicate professionalism in employment; *Argue and solve problems in their field of study;* *Show techniques and capabilities to search and use data to make decisions having considered social, scientific, and relevant ethical issues;* *Communicate effectively and convey information, ideas, problems, and solutions to experts and non-experts;* - Apply team and interpersonal skills which are suitable to employment; and - Possess independent study skills to continue studying at a higher level with a high degree of autonomy.
Masters degree	*Demonstrate continuing and additional knowledge and comprehension above that of the bachelors degree and have capabilities to develop or use ideas, usually in the context of research;* *Use the knowledge and comprehension to solve problems related to the field of study in new situations and multi-disciplinary contexts;* *Integrate knowledge* and manage complex matters; - Evaluate and make decisions in situations without or with limited information by considering social responsibilities and related ethics; *Deliver clearly conclusions, knowledge and the rationale to experts and non-experts;* and - Demonstrate study skills to continuously progress on their own with a high degree of autonomy to do so.
Doctoral degree	*Show a systematic comprehension and in-depth understanding of a discipline, and mastery of skills and research methods related to the field of study;* *Show capabilities to generate, design, implement, and adopt the integral part of research process with scholarly strength;* *Contribute to the original research that has broadened the boundary of knowledge through an in-depth dissertation, which has been presented and defended according to the international standards including writing in internationally refereed publications;* *Make critical analysis, evaluation, and synthesis of new and complex ideas;* *Communicate with peers, scholarly communities, and society at large concerning the field of expertise;* and - Promote technological, social, and cultural progress in a knowledge based society in academic and professional contexts.

Source: Malaysian Qualifications Agency (2007, pp. 9-11)

Despite the government's expectations, existing literature suggests that local public university graduates have issues with employability, as compared to graduates from local private universities. Although employers who have had the experience of hiring graduates from local public universities were satisfied with the quality of the graduates (Singh & Singh, 2008), Ram (2009) claimed that 70 per cent of local public university graduates were jobless. With a significantly low unemployment rate in Malaysia, i.e., 2.7 per cent (Department of Statistics Malaysia, 2014), the percentage indicated that local public university graduates in Malaysia have a relatively low employability rate.

The study was supported by findings from Shafie and Nayan (2010) who reported that local graduates from Multimedia University (MMU), a well-known private university in Malaysia, has the highest employability rate; public universities did not fare well. The study was conducted in nine different local universities and also one category comprising overseas franchise universities operating in Malaysia. Each of these universities was represented by 100 graduates. The results of the study show the numbers of graduates from each university/category, out of the 100 graduate participants, who successfully gained employment.

The results are as follows: 77 from University Teknologi MARA (UiTM); 74 from Universiti Sains Malaysia (USM); 71 from Universiti Islam Antarabangsa (UIA); 65 from other overseas franchise universities; 63 from Universiti Malaya (UM); 61 from Universiti Putra Malaysia (USM); 38 from Universiti Kebangsaan Malaysia (UKM); 35 from Universiti Teknologi Malaysia (UTM); 34 from Universiti Malaysia Sarawak (Unimas); and an average of one graduate from Kolej Teknologi Tun Hussein Onn (KUITTHO). A study, by Ismail (2011), further examined characteristics of local university graduates who were unemployed and found that, on average, these graduates lacked a good command of English and other soft skills such as analytical thinking, intelligence, independence, leadership, communication and computer skills, and work experience. In this situation, the study assumed that student information skills programmes in public universities would help public university graduates in Malaysia to increase their employability rate through graduates' acquisition and application of information-related skills as advocated by the national education framework.

2.8 Student Information Skills Programmes in Malaysian Public Universities
Information skills programmes have been introduced in Malaysian public universities to transform students into knowledge workers (Chan, 2003; Edzan & Mohd Saad, 2005; Mohd Saad & Awang Ngah, 2002) who are characterized by their ability to "acquire, apply, synthesize and create knowledge" (EPU, 2001, p. 112). Although the first link between higher education and information skills programmes in Malaysia appeared in Lah (1998), the programmes might have been introduced in Malaysian public universities earlier as they are part of the Malaysian National Information Technology Agenda (NITA) established in 1996. The agenda aimed to facilitate the development of a knowledge society by ensuring that national human capital becomes information literate by the year 2020 (Chan, 2003).

The introduction of the Malaysian Qualification Framework (Malaysian Qualifications Agency, 2007) into the national education system in late 2006 further reinforced students' acquisition of information skills in Malaysian public universities. Italics shown in Table 2 indicate that information skills are parts of desirable learning outcomes for Malaysian higher education students. The framework implies that student acquisition and application of information skills is no longer located within the library premises, but must be integrated within classroom learning. In this respect, librarian–teacher collaboration is the way forward in helping students to demonstrate a series of information skills across their university learning.

Findings by Mohd Sharif Mohd Saad and Zainab (2002) indicated that librarians in Malaysian public universities believed that student information skills programmes were important in facilitating student learning, and thus enhancing the universities' library's image in the eyes of students and teachers. The study also found that the librarians conducted the programmes via a combination of delivery methods such as library orientations, on-demand workshops, lectures, and hand-on exercises. However, only a few of them used short tests and quizzes to assess students' acquisition of information skills. Moreover, the study showed that most of the librarians were unsure if their existing programmes qualified as information skills programmes because they covered only the following components of information skills:

- Locate information resources within the university library
- Search and retrieve information from various sources using a variety of information systems
- Differentiate primary and secondary sources
- Evaluate validity and reliability of the search results.

Similarly, Edzan and Mohd Sharif Mohd Saad (2005) found that student information skills programmes in Malaysian public universities were conducted via several means; orientation, miscellaneous, research student and credit hour programmes which may cover different status, audience, duration, content, teaching methods, and assessment methods. As illustrated in Table 3, orientation and miscellaneous types of programmes were conducted in isolation from classroom learning and focused on students' searching and retrieving of information sources. On the other hand, Table 9 shows that student research and credit hour types of programmes were integrated across classroom

learning. Table 3 and Table 4 show that, except for recording information available in research student and credit hour types of programmes, all information skills programmes in Malaysia focused heavily on information search and access.

Table 3: Summary of orientation and miscellaneous information skills programmes in Malaysian public universities (taken from Edzan & Mohd Saad, 2005, p. 99)

PROGRAMME	Orientation	Miscellaneous
STATUS	Compulsory	Optional
AUDIENCE	New students	All students
DURATION	1-2 hours	1-2 hours
PROGRAMME CONTENT	• Basic Library Skills • Library Skills Course • Library Orientation / Instruction Programme • Basic Library Skill Classes • Library Orientation Programmes • Introduction to Library Use • Library Usage Workshop • Skills in Using Academic Resources • Orientation Programmes For New Students	• Information literacy skills classes/ workshop • Information search skills training sessions/ workshops • Information search skills • Information search strategy • Library catalogue • Library usage workshop • Navigating the Internet • CD-ROM databases searching skills • Online databases searching skills • Research information service • Using in-house database
DELIVERY METHOD	• Lecture • Guided tour • Instructional session • Video presentation • Exercises • Multimedia presentation	• Lecture • Instructional sessions • Exercises
ASSESSMENT METHOD	• Evaluation sheet	• Evaluation sheet

Table 4: Summary of research student and credit hour information skills programmes in Malaysian public universities (taken from Edzan & Mohd Saad, 2005, p. 99)

PROGRAM	Final year/Research Student	Credit Hours
STATUS	Optional	Compulsory
AUDIENCE	Final year students and postgraduates	First year or others
DURATION	A few periods from the class time table	1 semester (14 weeks)
PROGRAMME CONTENT	• Advanced information skills programs • Advanced library skills classes • Library research skills • Online databases searching skills • Research guidance services • Workshop on information skills	• Bibliographic databases and information skills (I credit) • Information skills course (1 credit) • Information literacy (2 credits) • Managing resource centres (1 credit)
DELIVERY METHOD	• Lecture • Instructional sessions • Exercises	• Lecture • Instructional sessions • Exercises
ASSESSMENT METHOD	• Evaluation sheet	• Assignment • Test • Project • Final Examination

Such findings are consistent with Karelse (1998) and Reid (1998) who argued that information skills programmes in Malaysian higher education emphasized students using computer-based applications to search and access information sources, and lacked emphases on students analyzing and synthesizing information, and developing understanding. Chan (2003) found further that information skills programmes that were run in Malaysian public universities were ineffective in assisting student learning if classroom teachers did not design and implement classroom learning activities or assignments that require students to apply information skills.

Similarly, Badger and Roberts (2005) found that the lack of exposure in conducting independent research may lead to a low acquisition and application of information skills among students in Malaysia. The lack of exposure could be associated with the employment of more traditional teacher-centred learning methods and low student fluency in English. Similarly Gorman and Dorner (2006) argued that local culture in Asian countries that employ teacher-centred learning or traditional learning that passes knowledge from one generation to the next does not encourage an independent process of knowledge construction, and thus could hinder student acquisition and application of information skills in these countries. In this light, how teachers, librarians, and students perceived their social role in the context of learning could influence student acquisition and application of information skills (Badger & Roberts, 2005, p. 11). For example, if librarians viewed their social role as the custodians of library collections and facilities, they could inhibit the open communication and environment necessary for students to learn about, experience and use the collection and facilities. Such a view also creates an uneasy teacher–librarian relationship that hinders collaboration between them necessary for student acquisition and application of information skills.

Although numerous studies have been conducted to research student learning of information skills in Malaysian higher education, most of them focused on quantifying students' perceived or measured performance in information skills (e.g., Abang Ismail & Pui, 2006; Abdullah et al., 2006; Edzan, 2007). While these studies were helpful to estimate the level of student information skills in Malaysian higher education, they were unable to explain or refute the view that student information skills programmes in Malaysian public universities expose students to only selected components of information skills; namely searching and accessing information from multiple sources,

while neglecting components that dealt with the creation of new knowledge—a top priority in the Malaysian education and economic framework. Such findings would be significant in the light of the current development in Malaysian higher education that prescribed information skills as series of learning outcomes for higher education students. Accordingly, unlike practice in the past that locates student acquisition and application of information skills within the boundary of the library, studies that examine aspects of collaboration between multiple higher learning communities; teachers, librarians and students would help researchers and practitioners alike to understand and implement student learning of information that suits local and international information skills, educational and economic standards.

2. 9 Cultural and Learning Orientation in Malaysia

The literature suggests that, to some extent, there is a correlation between the Malaysian cultural orientation identified by Hofstede (2001) and Hofstede and Hofstede (2005) and teaching and learning orientation in Malaysia. Among others, Wilhelm (1995) employed the dimensions of power distance to explain the differences in communication and decision-making behaviours among Malaysian and American teachers during a field testing and evaluation process of a new curriculum model. According to Hofstede (2001) and Hofstede and Hofstede (2005), large power distance societies, such as Malaysia, accept that power is distributed unequally, and thus are more accepting of a hierarchical order. Members are expected to respect and honour parents, teachers and superiors and never openly argue with them in order to preserve face. Instead of a direct confrontation, large power distance societies use indirect communication channels to express complaints or dislikes, such as the use of a third person as an intermediary, body language, and withdrawal of favours. In contrast, small power distance societies such as the American, promote power equalization and thus are more flexible in terms of the hierarchical order, and expect members to practise two-way communication and directness, and have relatively independent relationships between subordinates and superiors.

In Wilhelm's (1995) study, it was found that the Malaysian teachers were relatively quiet during meetings; only giving opinions and criticisms when they were asked to do so. In contrast, the American teachers were more direct in terms of their criticism

toward the curriculum developer, while the Malaysian teachers used indirect language in their criticism and and paired the criticism with praise as if it were impolite and disrespectful to express their opinion directly to the developer. The Malaysian teachers were also found to be uncomfortable in taking control of the curriculum prototype, and preferred the developer to give detailed instruction on what they needed to do. Except for the younger teachers, the majority of the Malaysian teachers were uncomfortable with their role as a facilitator in classroom learning, saying that they would be questioned by parents as to why they allowed the children to learn on their own. Wilhelm (1995) found, further, that the Malaysian teachers emphasized formal testing of the curriculum to the extent that they wanted to know test questions and answers in advance in order to help students to answer the questions correctly. Lastly, Wilhelm (1995) observed that, while the American teachers in general were more concerned with student progress over time, student motivation and recognition of their learning needs, and daily attendance and participation, the Malaysian teachers were more concerned with student performance on the final exam and were less concerned about daily participation, weekly quizzes, or homework scores.

Wilhelm's (1995) study suggested that Malaysian teachers are comfortable with teacher-centred learning and were oriented towards student examination. Such an approach is the oppposite of student learning of information skills that requires teachers to provide various opportunities to students to search and use relevant information from multiple sources before constructing their understanding independently from teachers. The approach also inhibits student acquisition and application of creative and critical thinking in searching, evaluating and using information from multiple sources because there is no need for students to construct their own undrestanding. Interestingly, the study suggested further, that teachers' preference for teaching and learning approaches is influenced by their social role.

A similar trend was also found among Malaysian higher education students when Ziguras (2001) investigated why students in transnational higher education institutions from large power-distance countries, such as Singapore, Malaysia, and Vietnam, were initially uncomfortable using online learning systems. Ziguras (2001 found that Malaysians' preference for a traditional teacher-centred learning was evident from Malaysian parents' expectations of Malaysian transnational universities. Malaysian

parents expect these universities to offer extensive face-to-face teacher–student contact which actually minimizes independent student learning and the application of higher order thinking skills that are required to undertake such learning. Given the situation, it is no surprise that Malaysian parents, teachers, and students might feel uncomfortable when they are asked to independently and individually explore, experience, use, or evaluate new learning topics, models or systems that they are not familiar with. Similarly, coming from a society with a centralized and structured education system that practises traditional teacher-centred learning in primary and secondary education, Malaysian higher education students are used to being dependent on their teachers' lectures, notes, and assistance, as reported by Ziguras (2001). He reported that, in comparison to Australian students, "Malaysian students expect more direction, closer supervision, and have a greater regard for lecturers" (p. 8).

Other studies, such as the ones done by Smith (2001) and Badger and Roberts (2005) also suggested that Malaysia and other Asian countries employ teacher-centred learning, characterized by a low level of student ability to learn, think critically, and search, evaluate, use, create and communicate information independently from their teachers. This claim was supported by Bing and Ai-Ping (2008) who conducted a study on students in two distance higher education institutions in Malaysia and China and found that students in both institutions engaged less in asynchronous interactions that are associated with higher order thinking. Yong (2010) also found that Malaysian high school and university students tend to engage in surface rote learning, also known as learning by memorization, merely to pass examinations and thus, were not familiar with deep or intrinsic learning approaches that are underpinned by higher thinking skills.

However, in the context of Malaysia and other Asian countries that practise rote learning, the rote and deep learning dichotomy is still debated. For example, Tan (2011) argued that Eastern learners categorized memorization into mechanical memorization (rote learning without understanding), and memorization to attain understanding. Tan (2011) further posited that the memorization and understanding is a learning continuum that begins with "memorise with little understanding," "memorise to understand," and "understand and memorise." In her study, Tan (2011) found that memorisation is a culturally ingrained approach in non-Western countries that could lead to deep understanding. A relationship between rote and deep learning is also observed in student

learning of information skills. For example, it is expected at the beginning of information skills learning that students have a sufficient basic knowledge of their discipline—which students attained through rote learning. Through students' application of information skills that they have acquired during information skills programmes, students will refine, expand and add value to their basic knowledge.

There are also existing studies that examine learning orientations between different races of Malaysian students in higher education institutions. For example, although Reid (1987), Hofstede (2001), Hofstede and Hofstede (2005), and Badger and Roberts (2005) suggested that on the general Malaysian higher education students are more comfortable with group learning, Ahmad (2005) found that Malay undergraduate students favoured individual over group learning approaches. Similarly, Ahmad and Majid (2010) found that Malay adult learners are also inclined toward individualistic and long-term orientations. In another study, Tan and Pillay (2008) found that Chinese adult students who were oriented towards developing meaning or understanding out of their learning materials were inclined to adopt 'deep approach learning' and used understand and memorizing strategies, while Malay students with a similar orientation were less likely to do so. The study also found that Chinese students with an orientation towards 'reproductive learning' were likely to adopt the surface approach but were unlikely to adopt memorizing skills, while Malay students with a similar orientation were likely to adopt characteristics aligned with achievement and career motives, and memorizing approaches. Due to these patterns of learning behaviours, Tan and Pillay (2008) further argued that Chinese adult students were more likely to be successful students compared with Malay adult students because Chinese students have a stronger inclination to use a memorizing approach to understanding (which is more likely to lead to deep learning) while Malay students' adoption of the memorizing approach is more likely to lead to surface learning. While some studies supported that Chinese students perform better than Malay and Indian students in higher education institutions in Malaysia (e.g., Alfan & Othman, 2005; Tan, 2005), others said that they did not have enough evidence to support the proposition (e.g., Isa, 1995).

The literature also suggested that Malaysian students' orientation might be related to their gender groups. In this respect, existing studies reported that female students in schools and higher education institutions perform better than male students (Alfan &

Othman, 2005; Dahlan, Noor, Mustafa, Hashim, & Zulkifli, 2010). Among others, Dahlan et al. (2010) attributed the differences to gender differences in academic achievement at the school level. Existing studies also suggested that the differences could be influenced by various factors. For example female students have also been reported to have different learning orientations in the areas of self-regulation (Saad, Tek, & Baharom, 2009), motivation (Isa, 1995), and approaches to learning (Ahmad & Majid, 2010). However, despite the findings that support evidence of female students performing better than male students in Malaysian higher education institutions, Ismail (2011) reported that female graduates are less likely to be employed in comparison to male graduates.

2.10 Summary

This chapter has provided some background to my study to enable the reader to locate my findings in their context. Among other things, the chapter provided geographical, historical and political, and economic information about Malaysia. Also discussed were the development and types of public universities in Malaysia and it highlighted the graduate employability rates of the universities. This chapter also covered student information skills programmes in the context of Malaysian public universities that provided background information for this study and highlighted cultural and learning orientation in Malaysia that might influence student learning of information skills in the universities. This complements the review of relevant literature on student learning of information skills in Western higher education presented in the next chapter.

CHAPTER 3: STUDENT LEARNING OF INFORMATION SKILLS IN HIGHER EDUCATION AROUND THE WORLD

3.1 Overview

This chapter gives a review of literature that relates to student learning of information skills which mostly comes from the west due to a lack of related studies from non-Western countries. The literature covers the development and definition of information skills, as well as outcomes, enablers, learning theories, approaches, assessment, social factors and personal factors for student learning of information skills in higher education. However, some caution needs to be used in applying the information to Malaysia due to the different contexts and settings in which these studies were undertaken.

3.2 The Development of Information Skills

'Information literacy' is a term which was first introduced by Paul G. Zurowski in 1974 when he made a recommendation to the United States to develop a national programme that could assist the development of information literate workforces (Bawden, 2001; C. Bruce, 1997). Zurowski said that the information literate workforces "…had learned to use a wide range of information sources in order to solve problems at work and in his or her daily life" (as cited in Kerns, 2002, p. 351). Using the term 'information skills', Marland (1981), Irving (1985) and Herring (1996) introduced the information literacy concept in the United Kingdom and promoted information skills as a set of learning skills among school children which assists the children to use, transform, re-package, and communicate information. Simultaneously, during the 1980s, the information literacy movement was started in the United States when the American Library Association (1989) published a white paper on information literacy that underpinned the development of information literacy standards in primary, secondary, and higher education in the country (e.g., American Association of School Librarians & Association for Educational Communications and Technology, 1998; Association of

College and Research Libraries, 2000; Society of College National & University Libraries, 1999). In return the standards were used to develop information literacy standards for higher education such as those developed by the Council of Australian University Librarians (2001) and the Australian and New Zealand Institute for Information Literacy (Bundy, 2002).

3.3. The Definition of Information Skills

The terms 'information skills' and 'information literacy' are used in the literature interchangeably; information literacy is a term more commonly used in the United States, whereas information skills is more often used in Great Britain, Australia, and New Zealand (Joint Information Systems Committee, 2002). However, both the Society of College National & University Libraries (1999) and the Chartered Institute of Library and Information Professionals (2004) suggested that information literacy is the goal of information-literate individuals, while information skills are the means to achieve the goal. For example, the Chartered Institute of Library and Information Professionals (2004) stated that information literacy is an understanding of: "A need for information, the resources available for finding information, the need to evaluate results, how to work with or exploit results, ethics and responsibility of use, how to communicate or share your findings, and how to manage your findings" (Chartered Institute of Library and Information Professionals, 2012, p. 1), that requires individuals to master several information-related skills such as abilities to identify the need for information and resources available, and find, evaluate, use or exploit, communicate and manage information in an ethical and responsible manner.

In this study I agreed with the statements made by the Society of College National & University Libraries (1999) and the Chartered Institute of Library and Information Professionals (2004). However, after reviewing both the information skills and information literacy literature, I found that there is a fine line between the usage of these terms as both sources discussed perspectives, skills, behaviours or ways of thinking and doing, and processes that involved in any purposeful human–information interaction. Using this definition, I use the terms 'information skills' and 'information literacy' interchangeably throughout the writing of this thesis as advocated by the Joint Information Systems Committee (2002).

The interchangeability of definitions for information skills and information literacy is illustrated by Herring (2004) who defined information skills as "the skills which pupils use to identify the purpose of, locate, process and communicate information concepts and ideas and then reflect upon the effective application of these skills" (p. 74) and the Society of College, National & University Libraries (1999) that identified information literacy as a set of abilities:

> *to recognize a need for information, distinguish ways in which the information gap may be addressed, construct strategies for locating information, locate and access information, compare and evaluate information obtained from different sources, organise, apply and communicate information, and synthesize and build upon existing information, contributing to the creation of new knowledge* (p. 6)

On the other hand, instead of providing definition for information literacy, certain literature offered a list of attributes or indicators for information-literate individuals. For example, the American Library Association (1989, p. 1) stated that information literate people are those "who have learned how to learn—they know how knowledge is organized, how to find information and how to use information in a way that others can learn from them—they are people prepared for lifelong learning". Similarly, the Association of College and Research Libraries (2000) identified information-literate individuals as those who are able to "recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information" (p. 2).

Following the definitions of information skills and information literacy as well as indicators for information-literate individuals, I have defined information skills in this study as a set of abilities that enables individuals to identify needs or goals to engage with information sources; to search, evaluate, analyze and synthesize information sources; to use synthesis to accomplish those goals; and to communicate those goals and the process that lead to accomplishment of those goals.

However, abilities-based definitions of information skills have been criticized because they focus on information processing skills, particularly information retrieval and consumption skills, while overlooking the process of learning or knowledge construction which involves the process of transformation of information into knowledge or understanding (Marcum, 2002; Ward, 2006; Williams, 2001). Marcum (2002) and Kapitzke (2003) also argued that the abilities-driven definitions are underpinned by communication and cognitive psychology theories that view information literacy as information processing in which users receive information and

process the information into concepts. Using an ecological perspective, Marcum (2002) critiqued such definitions because, unlike computer information process, "individuals do not receive signals [information] from the environment but reciprocally participate in its creation" (p. 5).

Kapitzke (2003) highlighted that using cognitive psychological perspective, information literacy would become a set of processes, concepts, behaviours, frameworks, attitudes, and skills that is located "inside [an] individual student's head" (p. 45) which advocated a positivist view of understanding information literacy. As a result, information skills would thus be seen as a value-free 'operational' process of information consumption which ignores the "sociocultural, historical, and ideological processes of knowledge construction and justification" (p. 46). On a similar note, Williams (2001) and Harris (2008b) stated that the literature also ignores issues of uncertainty and risk-taking in student information consumption, production, and dissemination in the context of existing power and values within various socio-cultural dimensions. Similarly, Harris (2008b) asserted that students construct information literacy as they engage in the practice of communities in which they are members, which highlights the role of values underpinning the formation of those communities and their practice in understanding information literacy. Specifically, using a critical perspective, Harris (2008b) defined information literacy as a "discursive practice in information use" (Harris, 2008b, p. 431), an idea developed by, among others, Talja and McKenzie (2007) who posited that "information needs, seeking, and use as part of or as embedded in cultural, social, or organizational practice" (p. 101).

Other researchers also located information literacy as a set of knowledge, processes or behaviors within certain social contexts. For example, Shapiro and Hughes (1996) proposed information literacy as "a new liberal art that extends from knowing how to use computers and access information to critical reflection on the nature of information itself, its technical infrastructure, and its social, cultural, and even philosophical context and impact" (p. 1). UNESCO (2006, c. 2008) and Catts and Lau (2008) viewed information literacy as an extension of reading and arithmetic abilities or skills that enable individuals to participate in their communities' intellectual activities, necessary for individuals and their communities to function and progress in the context of society, work, well-being, and education. As a process, Abilock (2004, p. 10) stated that

information literacy is a "transformational process in which the learner needs to find, understand, evaluate, and use information in various forms…for personal, social, or global purposes" (p. 10). And, as a set of behaviours, Webber and Johnston (2006, p. 1) identified information literacy as "the adoption of appropriate information behavior to identify, through whatever channel or medium, information well fitted to information needs, leading to wise and ethical use of information in society" (p. 1).

Besides its definitions, the term 'information literacy' has also been criticized because it misleadingly conveys the meaning of basic reading and writing literacy of printed materials (e.g., Harris & Millet, 2006; Marcum, 2002) as well as the technology or environment for accessing and retrieving information and its sources (e.g., Bundy, 2002; Fryer, 2005). Alternative terms such as 'information fluency', 'sociotechnical fluency', 'digital literacy', and 'e-literacy' were introduced in literature to replace information literacy. For example, Harris and Millet (2006) advocated for information fluency because 'fluency' fits the requirement of learning outcomes, objectives, and assessment in education. On the other hand, Marcum (2002) suggested the term information literacy be replaced by 'sociotechnical fluency' which conveys a concept of compounded skills that cover "the visual, the interactive, and the cultural domains" of knowledge construction process that better reflect the current social and psychological aspects of learning (Marcum, 2002).

Likewise, to reflect the growing usage of information communication and technology as mediums of teaching and learning, various terms such as 'digital literacy' (e.g., Bundy, 2002; Fryer, 2005) and 'e-literacy' (e.g., Aberton, 2006; Badger & Roberts, 2005) were introduced into literature to differentiate information access, use, and communication within digital/electronic/wireless and conventional learning environments. In this regard, Fryer (2005) defined digital literacy as a set of "abilities to appropriately access, validate, synthesize, and utilize both analog and digital information sources to achieve a defined purpose", which "includes the abilities to communicate and collaborate effectively with information, transforming it into knowledge through a process of authentic and contextual utilization" (pp. 7-8). On the other hand, e-literacy is considered to be "information technology literacy [that] underpins information literacy attainment" (Badger & Roberts, 2005, p. 28) and better suits "information literacy in an age of digital information" (Beeson, 2006, p. 210).

Based on the literature, I assumed that information skills are ways of thinking and doing that enable individuals to participate in any purposeful human–information interaction such as identifying, accessing, evaluating, transforming, creating, communicating, and negotiating information from multiple sources. Similar to Bawden (2001), Marcum (2002), UNESCO (2006) and Harris (2008b), I also posit that, in the context of higher education, information skills can be constructed, reconstructed, or even deconstructed at personal and social levels as students individually and collaboratively engage in personal practice and the practice of multiple communities in higher education.

3.4 Outcomes for Student Learning of Information Skills

In this study I considered several lists of information literacy standards for higher education and identified the desired student learning outcomes for this study. These standards included those developed by the Australian and New Zealand Institute for Information Literacy (Bundy, 2004), the Association of College and Research Libraries (2000), and the Society of College National & University Libraries (1999). My analysis indicated that the outcomes of student learning of information require higher education students to acquire and demonstrate the ability to:

1. Define information need;
2. Identify and select information sources;
3. Retrieve information and its sources;
4. Evaluate information and its sources;
5. Record, analyse and organize information and its sources;
6. Synthesize information to construct understanding;
7. Use the understanding to attain a specific goal;
8. Communicate and validate the understanding and goal;
9. Understand ethical, personal, and social issues of accessing and using information.

My analysis indicated that the learning outcomes for student learning of information skills as sequential information-related thinking and behaviours. The linear way of conceptualizing the learning outcomes showed the influence of cognitive information processing which is typical in information skills studies (Kapitzke, 2003; Marcum, 2002). However, as we often experience, the process of developing and using understanding to accomplish a specific goal is complex and recursive in nature. For

example, as our understanding becomes crystallized, we often change the way we make sense of the available information; as a result, we might retrieve more information or re-evaluate the information that we have discovered or used. Respectively, by assuming that the acquisition and demonstration of information skills learning outcomes is linear in nature, we tend to oversimplify the complex process of knowledge construction.

Additionally, my analysis suggested that the information skills learning outcomes are being developed as one model that fits all, and thus, are value-, emotion- or context-free in nature. In contrast, Kuhlthau (1994, 2004, 2008) confirmed that students experienced and performed a series of thoughts, feelings, actions, and strategies while engaging in information skills-related activities. Based on this finding, Kuhlthau (1994) developed an information search process model that suggested student engagement in information skills learning is a holistic process that involves student cognitive, affective, and action/psychomotor domains as illustrated in Table 5. However, Kuhlthau focused only on the process of identifying information need and information search, and did not explain dimensions that were involved in student attainment of other outcomes of information skills learning in higher education.

Following my analysis that suggested the developed learning outcomes are context-free, it is also expected that student acquisition and demonstration of information-related thinking processes and behaviors are solely dependent on students' own abilities or other personal factors, and independent of the students' context, environment, and culture. However, in reality there are various social and interpersonal factors that may impact on the information-related thinking and behaviours of higher education students. For example, Chan (2003) and Badger and Roberts (2005) challenged the radical constructivist view by saying that classroom teachers' expectations, classroom learning approaches and other socio-cultural influences, such as teacher, librarian and student social roles, may impact on the way students perform information-related behaviours and thinking, thus highlighting the interplay of context and other socio-cultural dimensions in student learning of information skills in higher education.

On a similar note, C. Bruce (1997) also argued that existing information skills standards for higher education are "views of experts" (p. 40) which might not necessarily reflect experience and perception of those engaged in student learning of information skills.

Using a relative subjectivity perspective, Bruce examined further the relations of person and information literacy as conceived by higher educators in Australia and developed her Seven Faces of Information Literacy which categorized information literacy into seven categories:

Table 5: Dimensions of thoughts, feelings, actions and strategies in the Information Search Process Model (summarized from Kuhlthau, 2008)

Task	Thoughts	Feelings	Actions	Strategies
Task Initiation: To prepare for the decision of selecting a topic **(Stage 1)**	**C**ontemplating assignment **C**omprehending Task **R**elating prior experience and learning **C**onsidering possible topics	**A**pprehension at work ahead **U**ncertainty	**T**alking with others **B**rowsing the Library	**B**rainstorming **D**iscussing **C**ontemplating possible topics **T**olerating uncertainty
Topic Selection: To decide on topic for research **(Stage 2)**	**W**eighing topics against criteria of personal interest, project requirements, information available, and time allotted **P**redicting outcome of possible choices **C**hoosing topic with potential for success	**C**onfusion **S**ometimes Anxiety **B**rief elation after selection **A**nticipation of prospective task	**C**onsulting with informal mediators **M**aking preliminary search of library **U**sing reference collection	**D**iscussing possible topics **P**redicting outcome of choices **U**sing general sources for overview of possible topics
Prefocus Exploration: To investigate information with the intent of finding a focus **(Stage 3)**	**B**ecoming informed about general topic **S**eeking focus in information on general topic **I**dentifying several possible focuses **I**nability to express precise information needed	**C**onfusion **D**oubt **S**ometimes threat **U**ncertainty	**L**ocating relevant information **R**eading to become informed **T**aking notes on facts and ideas **M**aking bibliographic citations	**R**eading to learn about topic **T**olerating inconsistency and incompatibility of information encountered **I**ntentionally seeking possible focuses **L**isting descriptors
Focus Formulation: To formulate a focus from the information encountered **(Stage 4)**	**P**redicting outcome of possible foci **U**sing criteria of personal interest, requirements of assignment, availability of materials, and time allotted **I**dentifying ideas in information from which to formulate focus **S**ometimes characterized by a sudden moment of insight	**O**ptimism **C**onfidence in ability to complete task	**R**eading notes for themes	**M**aking a survey of notes **L**isting possible foci **C**hoosing a particular focus while discarding others, or **C**ombining several themes to form one focus
Information Collection: To gather information that defines, extends and supports the focus **(Stage 5)**	**S**eeking information to support focus **D**efining and extending focus through information **G**athering pertinent information **O**rganizing information in notes	**R**ealization of extensive work to be done **C**onfidence in ability to complete task **I**ncreased interest	**U**sing library collect pertinent information **R**equesting specific sources from librarian **T**aking detailed notes with bibliographic citations	**U**sing descriptors to search out pertinent information **M**aking comprehensive search of various types of materials, i.e., reference, periodicals, nonfiction, and biography **U**sing indexes **R**equesting assistance of librarian
Search Closure: To conclude search for information **(Stage 6)**	**I**dentifying need for any additional information **C**onsidering time limit **D**iminishing relevance **I**ncreasing redundancy **E**xhausting resources	**S**ense of relief **S**ometimes satisfaction **S**ometimes disappointment	**R**echecking sources for information initially overlooked **C**onfirming information and bibliographic citations	**R**eturning to library to make summary search **K**eeping books until completion of writing to recheck information

1) Information literacy is seen as using information technology for information retrieval and communication (category 1);

2) Information literacy is seen as finding information located in information sources (category 2);

3) Information literacy is seen as executing a process (category 3);

4) Information literacy is seen as controlling information (category 4);

5) Information literacy is seen as building up a personal knowledge base in a new area of interest (category 5);

6) Information literacy is seen as working with knowledge and personal perspectives adopted in such a way that novel insights are gained (category 6);

7) Information literacy is seen as using information wisely for the benefit of others (category 7).

These categories imply that information literacy is not an end but a purposeful and executing process (category 3) which is underpinned by the application of information technology (category 1). Additionally, Bruce's categories are found to be parallel to outcomes of student learning of information. For example Bruce's second, fourth, fifth, sixth, and seventh categories are equivalent to the third (retrieve information sources), fifth (record, analyze, organize information and its sources), seventh and eighth (use information to construct understanding and apply the understanding for a specific goal), and ninth (understand ethical, personal and cultural issues of accessing and using information) outcomes for student learning of information skills in higher education.

Interestingly, reviewing existing competing perspectives in information skills studies, (i.e., cognitive information-processing, radical constructivist, relative subjectivity, and social constructivist), actually contributed towards my understanding of student learning of information skills learning in higher education. For example, although outcomes for student learning of information skills have been conceptualized in the literature as student acquisition and demonstration of a set of sequential information-related thinking, feeling and behaviours, at one end, the process of acquisition and demonstration is viewed to be influenced by individual student personal factors, while at the other end, the process is seen to be influenced by student social factors. Therefore, the current study posits that an examination of the interaction between personal and social factors in student learning of information skills could fill in the gap left by the studies and by doing so offers an holistic understanding of student learning of information skills in higher education.

3.5 Enablers for Student Learning of Information Skills

The available literature often associates information skills with information technology, library, and critical thinking skills, with the context of lifelong learning and the knowledge society. For example, Harris and Millet (2006) asserted that a combination of "technological literacy, information literacy, and critical thinking" (p. 533) could promote lifelong learning that sustains a knowledge society. Likewise, Catts and Lau (2008) argued that a combination of information, media, basic oral communication, and reasoning literacy could lead to the development and running of such a society. On the other hand, Bundy (2004) suggested that information skills are made up of interrelated skills identified as critical thinking, computer, library, and learning skills, which was also posited by Humes (1999) and Marcum (2002). Similarly Bruce's (1997) conception of information literacy was underpinned by the use of information technology, library, and critical thinking skills.

Based on this literature, my study also considers that library, computers, and critical thinking skills are enablers for students to obtain positive outcomes for information skills learning. Although only a few studies associated information skills with creative thinking skills, due to the significant role of creative thinking in the knowledge construction and communication process, this study also includes creative thinking skills as one of the enablers assisting student acquisition and demonstration of information skills learning outcomes. A cross-analysis between student learning of information skills outcomes and enablers is illustrated in Table 6 and suggests the interwoven application of the enablers by students brings about student learning of information skills. Based on the cross-analysis, my study found that critical thinking skills application appears across all student information skills learning outcomes because the skills assist students to regulate a systematic, logical, transparent, and reflective way of thinking and behaving related to information-skills-related tasks. Likewise, the application of creative thinking skills helps students to succeed on personal levels by allowing them to identify information need, the needed information and its sources, and construct and communicate understanding and its artifacts. Additionally, student application of library and computer skills are concerned with a repeated or automatic process of using library cataloging and computer applications that enable students to retrieve, organize, and record information and its sources. The

relationship between student learning of information skills and enablers is further discussed below.

Library skills

C. Bruce (1997) defined library skills as individuals' ability to locate, evaluate, and use information. Following this definition, library skills may assist students to access, retrieve, evaluate, and use information to construct personal understanding, as well as requiring students to apply various levels of cognitive skills (C. Bruce, 1997; Moore, 1995), and computer skills (Eisenberg, Lowe, & Spitzer, 2004). Similarly, Balas (2006) stated that librarians must equip students with library skills to ensure that students are both computer- and information-literate. Following on from this, the current study views library skills as the application of cognitive, computer, and interpersonal skills in library-related activities such as using a library's cataloguing system; browsing, accessing, and evaluating conventional and online sources that are freely available and also those subscribed to by a library; and also consulting librarians on both activities. Due to the fact that library skills assist students in accessing relevant information and its sources in order to help in constructing personal understanding, the current study views library skills as parts of the skills which enable students to perform information skills learning outcomes in higher education. This position is similar to the one taken by the Society of College National and University Libraries (1999).

Table 6: A cross-analysis of enablers and outcomes for student learning of information skills

Outcomes of information skills learning	Library skills	Computer skills	Critical thinking skills	Creative thinking skills
Define information need(s)			√	√
Identify and select information sources	√		√	√
Retrieve information sources	√	√	√	√
Evaluate information and its sources			√	
Record, analyze, and organize information and its sources	√	√	√	√
Synthesize information or construct understanding			√	√
Assign meaning to understanding or apply understanding			√	√
Communicate and negotiate understanding and its meaning		√	√	√
Understand ethical, personal, and cultural issues of accessing and using information and its sources		√	√	

Computer skills

The essence of the relationship between computer skills and information skills as discussed in the literature could be summarized as "[c]omputer and information literacy go together like the old-fashioned horse and carriage" (Balas, 2006, p. 29). Computer skills are regarded as the basic skills in using computer hardware and operating systems, and standard software and network applications (Society of College National & University Libraries, 1999) which influence the ways in which students search, access, store, retrieve, record, organize, use, create, and communicate information. Due to its importance, the literature highlights computer skills as an enabler of information literacy (e.g., Association of College and Research Libraries, 2000; Council of Australian University Librarians, 2001). As a result, Balas (2006) urged librarians to assist students in becoming both computer- and information-literate, as the former would help the latter.

However, Godwin (2006) argued that being computer literate does not necessarily mean students will become *information*-literate. Although students in the information age are from the 'Y Generation' and are fluent in computer applications and technology, they lack the abilities to search, evaluate, analyze, and synthesize information and its sources in a critical and reflexive manner (Balas, 2006; Beeson, 2006; Godwin, 2006). Therefore, the current study views computer skills as parts of the skills which enable students to perform certain information skills learning outcomes (i.e., searching, retrieving, storing, creating, and communicating information and sources) that are underpinned by various applications and tools of information technology. However, the current study asserts that information technology skills alone are not sufficient in helping students to evaluate, analyze, and transform the information and its sources which they have retrieved into personal understanding, or in negotiating understanding. This is similar to the view taken by Hart (2001) who claimed that the knowledge construction process does not equate with computer fluency.

Critical thinking skills

Kurfiss (1988) defined critical thinking as "an investigation whose purpose is to explore a situation, phenomenon, question, or problem to arrive at a hypothesis or conclusion about it that integrates all available information and that can therefore be convincingly justified" (p. 2). A statement by Michael Scriven and Richard Paul in the 8th Annual

International Conference on Critical Thinking and Education Reform in 1987 for the National Council for Excellence in Critical Thinking (The Critical Thinking Community, 2011) described critical thinking as "the intellectually disciplined process of actively and skilfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action" which is based on intellectual values of "clarity, accuracy, precision, consistency, relevance, sound evidence, good reasons, depth, breadth, and fairness" (p. 1). The underpinning idea of critical thinking is "the examination of those structures or elements of thought implicit in all reasoning: purpose, problem, or question-at-issue; assumptions; concepts; empirical grounding; reasoning leading to conclusions; implications and consequences; objections from alternative viewpoints; and frame of reference" (The Critical Thinking Community, 2011, p. 1).

Following these definitions, critical thinking can be seen as a thinking approach that assists students in the construction of personal understanding by examining the way they treat information and its sources and the process of arriving at the understanding. Likewise, existing information skills learning outcomes for higher education students outline information skills as information-related behaviours and the thinking processes of students identifying, accessing, evaluating, organizing, and transforming information into personal understanding, and creating, communicating and negotiating the understanding and its artifacts. A comparison of critical thinking skills and information skills shows that there exists a close relationship between the two, which is evident in the literature. For example, Albitz (2007) and Loertscher and Woolls (1997) claimed that critical thinking is the 'end' for information skills, while the Association of College and Research Libraries (2000) and Bundy (2004) posited critical thinking as both the means and the end of information skills.

Similarly, Ward (2006), who questioned the predominant role of critical thinking in information literacy, while the Society of College National & University Libraries (1999) and Carey (1998) considered critical thinking skills as an enabler for students to perform information skills learning outcomes. For example, critical thinking skills assist students to identify the problems and the needed information; search, access, evaluate, and organize it; and use the identified information to construct personal knowledge or

understanding. In this respect, critical thinking is akin to an individual cognitive programme that monitors the operation of information skills which must be conducted in a logical, systematic, and transparent way. Although very important, the current study is of the view that students' mastery of critical thinking skills alone may be inadequate for enabling students to perform the required information skills learning outcomes, particularly in transforming existing information and its sources into a personal, unique or meaningful understanding. By limiting information skills to critical thinking, the process of transforming information into personal and meaningful understanding may be deterred as this often requires a prolonged engagement in the process, as well as the ability to think outside the box, as proposed by Ward (2006), the Society of College National & University Libraries (1999), and Carey (1998).

Creative thinking skills

Although Owusu-Ansah (2003) viewed both information and knowledge as the goals of information literacy, this study views the above statement as inadequate in describing the learning process in higher education which aims to develop students who are able to independently develop and apply personal understanding in the context of their knowledge discipline. Although the available literature suggested that knowledge construction is one of the features of information skills (e.g., Bundy, 2004; Humes, 1999; Marcum, 2002), some of them viewed knowledge as a mechanical output of the information retrieval and collection process (Marcum, 2002). Underpinned by the cognitive information-processing perspective, these studies viewed information literacy as a sequential process of changing raw data (noise), to perceived data, to information, and then to knowledge; this suggests that knowledge is the automatic and ultimate product of information (Marcum, 2002). However, viewed from constructivist perspectives, information and knowledge are not transferred from an environment to individuals; rather, they are interpreted and constructed by individuals within a specific context. Consequently, Marcum (2002) suggested that there must be a new way to highlight the complexity of the knowledge-construction process, a view which is also supported by Budd (2004), Riddle (2003), and Ward (2006).

Ward (2006) made a particular argument about the need for librarians and teachers to prepare students with the necessary skills to construct personal understanding from, or assign meaning to, the information that they have critically evaluated, analyzed, and

synthesized. Awang and Ramly (2008) found that creative thinking skills enable students to think and perform information-related thinking and behaviours, particularly in the areas that call for "search for alternatives" (p. 19), in which students explore the challenge of defining and articulating information need(s), generate ideas (analyzing and synthesizing or transforming information into personal understanding or developing understanding) and prepare for action (communicating the understanding, creating artifacts of understanding, and negotiating the understanding and artifacts of the understanding). This is not surprising as the literature stated that individuals with creative thinking skills would "[look] at things differently; musing, testing, experimenting, and challenging existing thought patterns" (Industry Skills Council, 2011, p. 2) which enable the individuals to "[have] unusual ideas and innovative thoughts, able to put things together in new and imaginative ways" (Ford, Knight, & McDonald-Littleton, 2001, p. 166). Such traits would help students to better perform information skills learning outcomes, particularly while they analyze, construct, apply, communicate and negotiate their personal understanding and its artifacts.

3.6 Learning Theories for Student Learning of Information Skills

Learning is a process that occurs when experience causes a relatively permanent change in an individual's knowledge or behaviour (Woolfolk, 1990). Learning theories explain perspectives or ways of thinking about learning which are used by learning theorists to design a variety of techniques or strategies to help students learn (Tarpy, 1997). In the context of student learning of information skills, the research literature suggests that information skills studies in schools (e.g., Eisenberg & Berkowitz, 1990; J.E. Herring, 1996; Irving, 1985) and in higher education institutes (e.g., Association of College and Research Libraries, 2000; Bundy, 2004; Kuhlthau, 1994, 2004, 2008) are often underpinned by constructivist learning theories. These theories are based on the assumption that "learning is an active, contextualized process of constructing knowledge rather than acquiring it" (Knowledgebase, 2011, n.p.). This perspective views knowledge as being constructed via personal experiences and social interaction, and highlights the role of past experiences and context of learning in constructing student understanding.

From a constructivist perspective, information skills learning is conducted in a multi-stage curricular or classroom unit that integrates students' previous learning experience and engages them in an authentic problem-solving process that prepares students for the

next learning experience (Thomas, 2004). The application of constructivist learning theory also posits that the key focus of information skills learning is to enhance students' understanding on the subject or content knowledge, not to acquire information skills for their own sake (Roger & Brown in Herring, 1996). Additionally, information skills learning can be conducted using behaviourism learning theory and Maslow's hierarchy need theory to reinforce and retain students' efforts and readiness to engage in information skills learning outcomes across stages of their learning process (Thomas, 2004).

Although the application of constructivist learning theory in information skills learning is embraced by literature, in reality it challenges the conventional way of student learning in higher education, particularly with regard to the roles of students, teachers, and librarians (Association of College and Research Libraries, 2000; Bundy, 2004; Kuhlthau, 1994, 2004, 2008). For example, there is a need for students to transform their role from passive learners to knowledge creators who not only collect information, but also use the information to develop a personal and deep understanding independently from their teachers. Badger and Roberts (2005) found that such independent student roles might be problematic among students who come from social groups that practise teacher-centred approaches of learning. Likewise, the constructivist theory requires librarians to transform their role from custodians of the library to collaborators of learning, acting as information activists—bridging students to information sources and higher learning. Teachers would also need to change their role from *sources* of learning to *collaborators* of learning. However, such transformation might be difficult in non-Western higher education institutions. For example, Karelse (1996) found that teachers and librarians in a South African university were unwilling to change their conventional roles due to their historical and cultural conceptions of, and roles in, learning.

The constructivist perspective also requires a comprehensive integration between information skills and classroom learning. This requirement demands librarians play a leadership role in addition to their existing 'multi-roles' of information-related organizers, tutors, and counselor (Kuhlthau, 1994). In addition to a higher workload, Chan (2003) found that, by undertaking a leadership role in student information skills programmes, academic librarians in one public university in Malaysia had to get out of

their comfort zones. For example, teachers could question the leadership role of librarians in helping students acquire information skills across classroom learning and challenge the authority of librarians as collaborators of learning in higher education. However, if teachers and librarians could acknowledge that they are all collaborators in learning, they would see that collaborative efforts between them are inevitable in order to further facilitate student acquisition of information skills in higher education.

3.7 Approaches for Student Learning of Information Skills

Thomas (2004) identified three approaches for student information skills programmes commonly employed by librarians across education institutions, known as 'source', 'pathfinder', and 'process' approaches. The source approach introduces students to the organization of a particular library collection and how students could use the collection in their study. Although the approach helps students to become familiar with the collection, it limits students' information skills to artificial, limited, and shallow access and use of information sources within a certain library collection.

The pathfinder approach assists students in searching and using broad and specific information sources within a particular subject. Although the approach assists students to identify various types of information resources relevant to their classroom subject, the approach was criticized for not allowing students to incorporate their existing knowledge, cognitive level, information needs, and information-seeking preference in searching and using information sources. Similar to the first approach, the pathfinder approach does not include certain components of information skills, particularly the skills of using and transforming information into understanding.

The process approach focuses on students' formulating authentic problems or questions; searching, collecting, and using information and its sources to develop understanding; and applying the understanding to answer or solve questions or problems across classroom subjects. Underpinned by the constructivist perspective, the process approach promotes contextual and in-depth learning among students by incorporating students' information needs, information-seeking preference, and cognitive ability in the process of developing understanding. Thomas (2004) further identified that the process approach is often implemented across educational settings, and is characterized by the following features:

1) The integration of students' prior knowledge in a research assignment to help students grasp new ideas and prepare for the next learning experience.

2) The goals and objectives of the research assignment are stated clearly to students. These include the level, depth, scope, approaches, and the learning outcomes required from the students' research assignment.

3) The incorporation of students' abilities to analyse and synthesize information that is underpinned by critical thinking.

4) The integration of the evaluation process that covers critical review on the relevance of information sources and the assessment of individuals during every stage of the research assignment.

5) The employment of a research assignment that motivates and provides meaning for students.

6) The incorporation of enablers for information-related skills such as information handling, critical thinking skills, IT skills, and library skills during the design and planning of the research assignment. These include reading, writing, speaking, and communication skills via the use of various learning techniques such as concept mapping, questioning, tutoring, oral recitation, group discussion, and writing exercises.

The popularity of the process approach in assisting student learning of information skills is due to its ability to assist students in acquiring and applying information skills in comprehending the depth and breadth of their subject content (Herring, 1996; Irving, 1985; Marland, 1981). For example, although Irving (1985) realized that the integration of information skills across curricula may challenge the way teachers teach in school, he urged information skills to be strategically programmed into the curriculum via classroom assignments that require students to use information-handling and library skills. Similarly, Herring (1996, 2006, 2004) posited that information skills are not the goal, but the means of assisting students in school to obtain in-depth understanding of their classroom subjects in an active and independent way.

In the context of higher education, the literature from western countries endorses the process approach that seems to underline most works done in higher education institutions (e.g., C. Bruce, 2001b; Bundy, 1999; Harris & Millet, 2006; Larkin & Pines, 2005). For example, Bundy (2004) reported that student information skills programmes in higher education were often conducted via generic, parallel, integrated, and

embedded approaches illustrated in Table 7. However, he claimed that the embedded approach, an application of the process approach, is by far the most effective in assisting student learning of information skills because it provides opportunities for students to experience (learning) information skills, reflect on the experience (being aware of the learning), and apply the experience to novel contexts (transfer of learning) in the context of classroom subjects. Respectively, the embedded approach focuses the key issue of higher learning that is student construction of new knowledge and using the knowledge to answer specific questions or solve specific problems in order to broaden the frontier of their knowledge discipline.

Table 7: Approaches of information skills programmes in higher education (Bundy, 2004, p. 6)

Approaches	Nature of approaches
Generic	Extracurricular classes and/or self-paced packages
Parallel	Extracurricular classes and/or self-paced packages that complement the curriculum
Integrated	Classes and packages that are part of the curriculum
Embedded	Curriculum design where students have ongoing interaction and reflection with information

Underpinning the embedded approach is the establishment of collaborative efforts between teachers, librarians and other instructional designers that transforms the design and delivery of both classroom learning and student information skills programmes. This view was echoed by the Society of College National and University Libraries (1999) that stated that information skills learning in higher education "requires a collaborative and integrated approach to curriculum design and delivery based on close co-operation between academic, library and staff development colleagues" (p. 1). Similarly, Iannuzzi (1999), the Association of College and Research Libraries (2000) and the Council of Australian University Librarians (2001) proposed that higher education incorporate "information literacy across curricula, and in all programs and services, [that] requires the collaborative efforts of academics, staff developers, learning advisors, librarians and administrators" (p. 3) to undertake "a comprehensive curriculum infusion…" in higher learning (Bundy, 2004, p. 29). Likewise, the Association of College and Research Libraries (2000) posited that the embedded approach calls for the transformation of "curriculum's content, structure, and sequence" (p. 5).

3.8 Embedded Models for Student Learning of Information Skills

Once the collaboration of teacher–librarian is established, Curzon (2004) proposed nine information skills learning models for the implementation of an embedded approach in higher education. These learning models are much used in Western higher education and provide strategies for librarians and teachers to work together in assisting student learning of information skills. These models, explained below, provide some flexibility for librarians and classroom teachers to better suit their personal preference and the context of classroom learning and their institution of learning; the nature of the curriculum; commitment of teachers, librarians, and students towards the learning. In all the models, the relationships between librarians and teachers are identified as factors that could affect the design and implementation of the learning as well as the attainment of the learning outcomes.

Introduction model

This model introduces information skills to freshmen via student orientation programmes, seminars, and other faculty courses or programmes. It teaches freshmen the basic concepts of information skills, explores core resources, and gives assignments that develop the freshmen's information skills in the context of classroom learning. Although the model promotes information skills to a bigger number of students, in reality, it is simply impossible for students to master and apply information-related behaviours and thinking processes within the one or two hours of an introductory session.

General education model

This model incorporates information skills in the certification of education goals of learning institutions. Librarians need to articulate information skills goals into the certification of learning courses and deliver information skills presentation based on the demand of the courses. In return, faculty members will support students' application of information skills by introducing information-skills-based assignments to students. However, by spreading information skills across university courses, the achievement of information skills may vary between courses unless a working committee continuously monitors progress.

Learning outcomes model

In this model, librarians work with a particular department or school to articulate information skills in the learning outcomes of the department or school. Later, the faculty members will articulate the learning outcomes in their curriculum development. This model promotes a strong commitment from the faculty members and provides a more effective means of assessment of student information skills. However, as the information skills integration is left solely to the faculty members, the achievement of information skills may vary across faculty members in terms of occurrence and levels of attainment.

Information literacy course model

In this model, a full information skills course is given to students, especially to freshmen graduates. The implementation of this model depends on the approval of the faculty curriculum committee. Additionally, librarians and faculty members would have to decide on the mode of the information skills course; either via stand-alone classes or attachment to a particular course. In this model, high commitment from librarians and classroom teachers ensures its workability in the context of higher education. Besides that, both teachers and librarians need to resolve costing issues related to sources employed during the information skills programmes.

Demonstration of mastery model

This model is closely related to a graduation or course requirement test, in which students are required to take a manual or online test to demonstrate their level of information skills. The test would provide quick feedback to students and the university, and if necessary, students may repeat the test. Although this model is the least resource-intensive and guarantees a complete student reach, there is a possibility that students' information skills remain minimal. Besides that, as students view information skills as another prerequisite competency test for their graduation or course, they may not necessarily apply the information skills in their learning processes. Due to these disadvantages, Curzon (2004) posited that this model is best used with other models.

Faculty focus model

In this model, librarians assist faculty members in teaching information skills during classroom learning. Librarians may provide various ranges of assistance and tools, such

as providing guidelines for faculty members to develop effective information skills-based assignments, and face-to-face or online tutorials for classroom learning. This model could reach many target students and assess students' information skills effectively as the assessment is prepared by faculty members and is directly related to the students' grades. However, since the decision to incorporate information skills in classroom learning is at the discretion of the faculty members, the application of information skills across classroom learning environments may vary.

College-readiness model

Assuming students in secondary school would be fed into higher education institutions, this model promotes a partnership between librarians and teachers in schools and higher education institutions to assist school children in developing information skills. However, issues of bureaucracies and jurisdictions may pose problems to the application of the model. Curzon (2004) suggested that librarians could assist teacher trainees at teacher training colleges in developing information skills. This can be considered as a way of helping our future generation to embrace information skills in their learning and other daily activities.

Entrance requirement model

This model shares some similarities with the demonstration of mastery model, whereby students are required to sit information skills test before entering college or university. This model requires a serious discussion between librarians, the university, and schools on the feasibility of the test, minimal levels of information skills, and follow-up actions for students who fail the test because a failure in the test should not prevent students from entering university.

On-demand model

This model is the typical information skills programme in higher education institutions. In this model, faculty members can request librarians to conduct information skills programmes or sessions for their classes at their own discretion. In addition to this, the model provides a platform for continuing discussion between librarians and faculty members on student learning of information skills. However, since each session often lasts for only one or two hours, some students might not be able to digest and perform all information skills learning outcomes during the session.

The literature also suggested that teacher–librarian collaboration is not without its pitfalls. For example, although librarians were urged to undertake a leadership role in initiating the collaborative efforts (e.g., Iannuzzi, 1998; Wright & McGurk, 2000), Julien and Boon (2002) and Chan (2003) found that librarians lacked confidence, knowledge, and teaching, learning and interpersonal skills to do so. The integration of student learning of information skills across classroom learning is not easy as the project takes more of librarians' time, planning and effort. Yet, Julien and Boon (2002) and Chan (2003) found that librarians lack support from classroom teachers and administrators; also they were not given sufficient resources or rewards for their efforts by their respective universities. Julien and Boon (2002) and Chan (2003) also highlighted teachers' perceptions that students could access information and its sources via the internet, and therefore underrated librarians' role in the process of student knowledge construction; which does not help towards the development and maintenance of teacher–librarian collaboration.

In my study, I viewed collaborative and embedded information skills programmes as requiring awareness and commitment from both teachers and librarians, as well as structured and tangible mechanisms in support of this. Failing to do that, in an age where information sources are widely, easily, and quickly accessible, the role of librarians in higher education might be understated, thus rendering them as obsolete in the eyes of teachers and students. On the other hand, teachers must acknowledge that they are not sole sources of knowledge; knowledge of experts and practitioners in student knowledge discipline are precious sources to facilitate student construction of authentic and meaningful knowledge. Similarly, although librarians might not be the experts in student knowledge discipline; however, by the nature of their training and work, they are experts in accessing, cataloguing, and organising public knowledge that were developed by experts and practitioners that are available in multiple sources and forms. Accordingly, without teacher–librarian collaboration, teachers would have to bear sole responsibility for assisting students in constructing new knowledge as well as accessing existing knowledge from multiple sources and in many forms.

3.9 Assessment for Student Learning of Information Skills
Learning assessment helps teachers to observe and adjust learning processes to suit individual students or a group of students, evaluate students' attainment of learning

outcomes, and assign grades to students (Anderson & Krathwohl, 2001). Therefore, information skills learning assessment is not only significant in determining the accountability and productivity of student information skills programmes (Iannuzzi, 1999), but also contributes towards the development and implementation of internal and external accreditation of higher education institutions (Dugan, 2002; Lopez, 2002; Ratteray, 2002).

Iannuzzi (1999) suggested four different levels of 'assessment methodology' that could access information skills learning outcomes for higher education students. The first level of assessment is within the library and is conducted independently by libraries during information skills programmes via manual or online workbooks or web-based modules, or a pre- and post-information skills competency test. The second level of assessment is within the classroom and which involves teachers in the assessment process; it focuses on the syllabus and products of courses, as well as the process of creating the products. Among the instruments that could be used in the assessment process are bibliography evaluations, reviews of assignments that reflect the process, and students' portfolios or journals. The third level of assessment is based on the campus assessment which blends information skills with the general goals of undergraduate education and student learning; it calls for "a library culture for information literacy [that is] strong enough to influence a campus culture" (Iannuzzi, 1999, p. 1). Among the assessment methods that could be employed at this level are reviews of academic and faculty development programmes, courses, and assignments that are integrated with information skills learning outcomes. Lastly, the fourth level of assessment deals with information skills assessment beyond the campus which involves the following dimensions:

1) Do students demonstrate the skills they need to pass certification or other professional testing filters?
2) Do students possess sufficient information skills to compete in the job market and secure a position within their field?
3) Do students have the technical, conceptual, and critical thinking skills of information literacy to succeed in their professions? (Iannuzzi, 1999, p. 1)

In addition, the assessment of information skills learning in higher education must be structured and guided by a recognizable conceptual framework which is systematically

and regularly updated, sustainable in term of its structures, processes, resources, as well as requires commitment from higher education institutions, and allows continuous improvement in student learning (Lopez, 2002). Some of the assessment tools currently employed by librarians are portfolios, rubrics, and performance-based instruments and methods which also include authentic assessment and competency testing (Gratch-Lindauer, 2003). However, Sonntag and Meulemans (2003) found that some librarians are reluctant to develop and use such tools because they lack the necessary knowledge and skills to undertake such tasks. Librarians are also of the perception that such tasks would increase their workload and reveal negative aspects of their programmes.

3.10 Personal Influencing Factors for Student Learning of Information Skills

Literature reported that student learning of information skills is influenced by multiple personal factors. As discussed below, among the factors that are identified in the literature are various personal factors of teachers, librarians, and students who engaged in the student learning of information skills that could directly or indirectly influence student learning of information skills in higher education.

Teacher personal factors

In order for student learning of information skills to take place, teachers must be willing and able to collaborate with librarians (Rader, 1999). However, the literature indicated that the difficulty of establishing such collaboration lies in convincing higher education teachers of the value of information skills in facilitating their classroom learning. For example, some of the teachers believed that internet or other online information databases can replace libraries, and therefore assumed that students can develop good research skills independent of the libraries (Wright & McGurk, 2000). In following this belief, teachers might underrate the benefits of information skills programmes to student learning, and thus omit the programmes from their classroom learning. Together with the teachers' misunderstanding of the role of libraries as keepers of 'containers' of knowledge, the belief minimizes librarians' chance to integrate information skills programmes into classroom learning (Julien & Boon, 2002).

Even when information skills are successfully integrated within classroom learning, Curzon (2004) and Wright and McGurk (2000) cautioned that students' attainment on the outcomes for information skills learning are still dependent on classroom teachers' knowledge, skills, and interest in information skills. For example, teachers who are

well-versed and informed in information-related skills are more likely to engage students in information skills programmes. In this light, Wright and McGurk (2000) recommended that librarians provide guidelines for teachers who are new to the integration of student learning of information skills in classroom learning. The information could help the teachers develop student learning outcomes that integrate classroom and information skills learning outcomes that lead to students' acquisition and application of information skills across classroom learning.

On the other hand, Iannuzzi (1998) suggested that librarians identify 'hot spots' within the higher education teacher community which the librarians could use as entry points to initiate the integration of student information skills programmes across classroom learning. For example, librarians can use their universities' mission statements, such as to produce graduates with certain attributes, as a starting point to develop collaborative efforts with teachers. In this respect, both the teachers and librarians are working together to serve the universities' goals. Iannuzzi (1998, 1999) also suggested that librarians be proactive by examining the classroom course syllabus, learning outcomes, and assignments and later identifying areas that could initiate the integration of the programmes within classroom learning. Such actions would be useful to teachers who are new to the universities or who never engage their students in information skills programmes.

Librarian personal factors

Librarians' personal views about information skills were identified as factors that could influence librarians' engagement in student learning of information skills in higher education (C. Bruce, 1997; Hepworth & Wema, 2006). Bruce (1997) found that librarians' views of information literacy range from acquiring mental models of information systems, a combination set of literacy, information and computer skills, to the way of learning or interacting with information (C. Bruce, 1997). These views were consistent with the way librarians define their main responsibilities in higher education, i.e., mainly to provide access to, and preserve, process, collect, and evaluate information sources for storage and retrieval (Kearns & Rinehart, 2011). Interestingly, the findings indicated that librarians ranked research consultation and management at the bottom of their list of responsibilities. These findings were incongruent with the demand for librarians to play an active and leadership role in initiating student information skills

programmes across classroom learning. Rader (1998, p. 219) further claimed that librarians need to "be flexible and diversified in order to communicate successfully with faculty and students; develop good and diverse teaching skills; prepare appropriate teaching materials and guides for students; evaluate the results of their instructions; [and] integrate library instruction programs into the curriculum" (p. 219). In reality, Julien and Boon (2002) found that academic librarians were not proactive enough in highlighting their expertise and building relationships and trust on campus because they felt self-conscious about their status as non-teaching staff. In the large power distance countries where hierarchical power relations are generally accepted, the different status of teaching and non-teaching staff could be one of the factors that inhibits teacher–librarian collaborative efforts in engaging students in information skills programmes.

Additionally, the lack of pedagogical knowledge and skills in terms of instruction design and implementation among librarians also limits their engagement in student learning of information skills in higher education (Grassian & Kaplowitz, 2001; Homann, 2001; Julien & Boon, 2002; Wright & McGurk, 2000). For example, librarians' lack of knowledge and skills in articulating information skills learning outcomes in the context of student learning outcomes would not be of any help to teachers who are new to student information skills programmes (Wright & McGurk, 2000). Such pedagogical knowledge and skills, according to Homann (2001), are essential to enable librarians to prepare integrated, valid and reliable assessment tools to assess student attainment on the outcomes for student learning of information skills across classroom learning. Since students would seriously perform tasks which they would be assessed on, the assessment tools are important as they function both as a measurement and a reinforcement of the attainment of information skills learning outcomes. In this respect, the literature recommended that librarians upgrade their knowledge and skills in pedagogical and psychological aspects of teaching and learning in higher education via informal or formal education programmes (e.g., Homann, 2001; Julien & Boon, 2002).

Student personal factors
The literature from western countries highlighted the fact that student engagement in information-related behaviours and thinking is influenced by their experience and exposure to library or other information environments (Neely, 2000), as well as their

daily tasks, needs, and interests (Gorman & Dorner, 2006; Grassian & Kaplowitz, 2001; Joint Information Systems Committee, 2002; Lantz & Brage, 2006). Since information skills learning outcomes are seen as a set of interrelated and sequential information-related behaviours and thinking processes, students' inability to perform certain information behaviours may hinder their achievement of the learning outcomes. For example Badger and Roberts (2005) and Hepworth and Wema (2006) found students' inability to independently search information and its sources affected their evaluation and use of them.

Studies also found that e-learners' perceptions of their level of information skills could be predicated by their learning strategies, critical thinking and motivation (Kilic-Cakmak, 2010). Specifically, Kilic-Cakmak (2010) reported that the use of metacognitive strategies would enable e-learners to define their information needs, develop proper searching strategies, to access information, evaluate and interpret the information, and evaluate the learning outcomes and process, while the use of critical thinking helps e-learners to organize and manage their learning processes. Kilic-Cakmak (2010) also found that an increase in student control belief will lead to an improvement in students' ability to develop searching strategies, access to information and communicating information self-efficacy. Brown (2005) found further a correlation between students' academic self-concept and information skills efficacy. Such a finding was expected because students who have a positive attitude towards learning are more likely to engage in knowledge-construction processes that involved the application of information skills.

Furthermore, Heinstrom (2003) found that students' personality traits (e.g., neuroticism, extraversion, openness to experience, competitiveness, and conscientiousness) are related to their information-seeking behaviours. Heinstrom (2003) identified the personality traits with the following preferences in information-seeking behaviours:

- *Neuroticism*: Preference for confirming information, feeling that lack of time was a barrier to information retrieval, difficulties with relevance judgements and insecurity in database searching, while an extrovert personality related to informal information retrieval as well as a preference for thought-provoking documents over documents which confirmed previous ideas.

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- *Openness to experience*: Preference for broad information seeking, incidental information acquisition, critical information judgement, preference for thought-provoking documents instead of documents which confirmed previous ideas and use of effort in information seeking.

- *Conservativeness*: Preference for documents which confirmed previous ideas instead of thought-provoking documents and were related to problems with relevance judgement.

- *Competitiveness:* Experiencing a lack of time as a barrier to information retrieval, problems with relevance judgement and competence in critical analysis of information.

- *Conscientiousness:* Preference for thought-provoking documents instead of documents which confirmed previous ideas and use of effort in information seeking. *Carelessness*, on the other hand, was related to problems with relevance judgement, feeling that lack of time was a barrier to information retrieval and preference for documents which confirmed previous ideas instead of thought-provoking documents.

The literature also highlighted the fact that students' beliefs about the nature of knowledge and sources of knowledge influence their approaches towards information-related behaviours and thinking. For example, C. Bruce, Edwards and Lupton (2006) found that students view learning as ranging from the acquisition and memorising of facts, understanding and interpreting information, to changing as a person. The diverse epistemology about the learning process and sources provides students with a range of unique, anticipated, personal, and individualized understanding of their information needs, which in turn guides their search, collection, management, analysis, and synthesis of information and information sources to develop their personal understandings (Badger & Roberts, 2005; C. Bruce et al., 2006; H. Bruce, 2005; Gorman & Dorner, 2006; Grassian & Kaplowitz, 2001).

Fitzgerald (2005) argued that the way students view knowledge (as either absolute or fluid), influences their ways of searching information sources and determining the credibility of information taken from those sources. Other studies also highlighted the role of students' beliefs in their information-related behaviours and thinking. For example, Jamali (2008) found that students' perceptions of the value of online

information sources are based on easy accessibility of the sources. Jamali (2008) also found that there is a relationship between perceived accessibility and the selection of particular information sources, which he explained using Zipf's 'least effort theory'. The theory posits that animals, people, and even well-designed machines will naturally choose the path of least resistance or effort to accomplish their goals.

The literature identified a close relationship between students' critical thinking and metacognition with their information-related behaviours and thinking processes. Fitzgerald (1999), for example, associated students' evaluation of information and its sources with the students' critical thinking and metacognition skills. While critical thinking provides dimensions such as reliability, quality, credibility, and usefulness for students to evaluate information as an object, metacognition provides knowledge and regulation about ways of thinking that help students to choose strategies or meta-strategies during the process of evaluating information and its sources.

On the other hand, Julien and Boon (2004, p. 561) found that aspects of personal situations and practices such as the nature of their information-related activities, time constraints, motivation, physical location of students and information sources, and the purpose of satisfying information needs also affected students' activities when searching, accessing, and evaluating information. They discovered that individuals are more likely to use information for decision-making when motivation was internal rather than external and mixed and to use more sources in an open or undetermined time constraint than in other time frames. When the information task is of a personal nature, individuals also use more sources of information and the most useful sources were chosen when onsite; indicating the use of familiar sources at hand rather than other sources available in the field.

3.11 Social Influencing Factors for Student Learning of Information Skills

The literature revealed that student learning of information skills could be influenced by various social factors. For example, Urena (2003) urged that, for any information skills programmes to be successful and sustainable, the development of the programmes must take into consideration the various social contexts in which the programmes would be implemented. As discussed below, national or regional, institutional and literacy contexts are among the social factors that had been identified in the literature of student learning of information skills.

National or regional contexts

Urena (2003) stated that "national and regional characteristics" (p. 5) are among factors that should be integrated into the development of successful student information skills programmes. For example, Grassian and Kaplowitz (2001) explained that national and regional characteristics, such as low- and high-context societies, influence strategies that students use to process and interpret information to develop their understanding, which, in turn, affect students' information-related behaviours and thinking. In a higher-context culture, many things are left unsaid, letting the culture explain; words and word choice become very important in higher-context communication, since a few words can communicate a complex message very effectively to an in-group (but less effectively outside that group). On the other hand, in a low-context culture, the communicator needs to be much more explicit and the value of a single word is less important.

Grassian and Kaplowitz (2001) argued further that students from a low-context culture are generally more able to acquire and information skills in comparison to students from a high-context culture because they detach themselves from objects being analysed, analyse objects in impersonal and objective ways, use directive and argumentative approaches of learning and look for faults in arguments. On the other hand, students from high-context cultures usually connect themselves to the objects being analysed, analyse objects holistically, use consensus approaches of learning, and try to understand the arguments instead of evaluating them. In comparison to students from low-context cultures, the characteristics of students from high-context cultures inhibit the use of critical thinking, which is identified as one of the enablers for students' application of information skills that could impact on the way the students identify, search, and use information and its sources to construct, communicate, and validate their understandings. In this respect student learning of information skills in high-context societies would face a greater challenge than those in low-context countries, i.e., the learning must be able to assist students to acquire critical thinking skills before helping them to acquire and use information skills.

Institutional contexts

Similar to Urena (2003) who identified institutional strategies as one of the factors that must be integrated in the development of student information skills programmes,

Iannuzzi (1998) highlighted the role of institutional culture or 'campus culture' in the design and implementation of information skills programmes. As illustrated in Table 8, Iannuzzi (1998) divided campus culture into subcultures of library, faculty, and administration that serve as indicators or 'hot spots' for librarians to initiate information courses within their institutions. Assuming further that librarians are ready to undertake the leadership role in higher education, Iannuzzi (1998) suggested that librarians clarify challenges of information literacy in the university, identify campus partners, establish a new approach to collaboration effort, develop information literacy education models, and identify multiple strategies for influencing campus culture in order to initiate or reinforce student information skills programmes within their institution of learning. Such efforts could be based on 'hot spots' or starting points for collaborative efforts identified within the university library, faculty and administration. Course syllabuses, assignments and assessments at the faculty could be starting points for librarians working with teachers to engage students in information skills programmes in higher education.

Table 8: Campus subcultures and hot spots for initiating student information skills programmes (summarized from Iannuzzi, 1998)

Campus subcultures	Hot spots for information skills programmes
Library	• Mission statement • Strategic plan • Individual goal for information literacy performance • Funding/support from institution • Rewards system for active participants of information literacy programmes
Faculty	• Faculty senate and committees • Curriculum—course syllabus, assignment, assessment
The Administration	• University's mission/goals • University's strategic planning documents • Funding

In this sense, the integration of library functions into higher learning, and the development and implementation of information skills learning and assessment across classroom learning suggests that the development and implementation of student learning of information skills are no longer a personal endeavour of certain teachers and librarians. In order for student learning of information skills to be successful, these efforts must become a conscious and collective effort at an institutional level (Bundy, 2004; Dugan & Hernon, 2002; Hepworth, 2000; Rockman, 2004; Society of College National & University Libraries, 1999; Wright & McGurk, 2000).

Furthermore, institutional top-down strategies are required to prepare students, teachers, and librarians for their new roles in student learning of information skills (Badger & Roberts, 2005; Gorman & Dorner, 2006; Grassian & Kaplowitz, 2001). Institutional culture towards engaging students in information skills learning and application could be traced to institutional missions, goals or vision documents, and strategic plans relating to the national policy and accreditation (Iannuzzi, 1998, 1999; Wright & McGurk, 2000). Such a cultural shift would help academic libraries to have a dedicated budget and librarians, and necessary equipment and technology for the running of student information skills programmes, which could reduce a 'burn out' phenomenon among librarians in academic libraries, particularly at the beginning of every university semester when student information skills programmes were at their peak (Julien & Boon, 2002). These types of support are paramount in view of existing studies that find the failure of student information skills programmes in higher education is due to faculty's lack of understanding of the importance of student information skills, as well as a lack of support from university administration (e.g., Julien & Boon, 2002; Wright & McGurk, 2000).

In line with the literature, I believe that an institutional culture that focuses on student learning of information skills would assist teachers, librarians, and students in forming a partnership that enhances interaction and collaboration between them through working with various 'hotspots' identified within the institutions. Existing literature has identified these interactions as key for success in information skills programmes in higher education (Badger & Roberts, 2005; C. Bruce, 2001a; D'Angelo & Maid, 2004; Grassian & Kaplowitz, 2001; Jackson, 2007; Saunders, 2007). Specifically, Neely (2000) found that teacher–student interaction helps students to gain exposure to the information environment which assist their acquisition and demonstration of information skills learning outcomes. Similarly, Badger and Roberts (2005) discovered that student–librarian interaction is essential in assisting students to use the available library collection and facilities for their classroom learning. Hence, the integration of student learning of information skills across classroom learning is one of the platforms in higher education that would realize and maximize the student–teacher and student–librarian interactions.

Literacy contexts

Takenouchi (2004) claimed that 'literacy fields' is one of the contexts in which information skills would be developed and applied. The literacy field could be equivalent to specific contexts in which how information and its sources are accessed and used by information users. Takenouchi (2004) gave as examples, children studying at schools, college students and scholars, business persons, information specialists, information-handicapped persons, and the general public. Without the literacy fields, the meaning of "ability to use information" (Takenouchi, p. 3) would be rendered meaningless because the types of information and their use would be specified by the positions or situations which information users belong to. Urena (2003) added that literacy fields could be expanded to student age and cohort, educational programmes, academic disciplines, and future professional employment. Others viewed knowledge discipline as an important literacy field that influences how students access and use information in meaningful, purposeful, and critical ways (e.g., Elmborg, 2006a, 2006b; 2002, 2003; Grafstein, 2002; Simmons, 2005, 2007). The development of information literacy standards for Science and Technology (2011) and Psychology (2006) by the Association of College and Research Libraries highlighted that specific knowledge discipline influences the outcomes of student learning with information in higher education. Lastly, Fields (2001) suggested that women's structure of knowledge differs from their male counterparts and therefore could influence the way students construct and validate their understanding and the process of reaching the understanding. This finding suggested that gender could be another form of literacy field for student learning of information skills.

3.12 Summary

This chapter explained the chronological development and various definitions of information skills in the West. It also identified the outcomes and various enablers for student learning of information skills in higher education as well as a few learning theories underpinning the student learning. It discussed further existing approaches and embedded models, and assessment for student learning of information skills in higher education. Finally the chapter highlighted social and personal influencing factors for student learning of information skills in higher education that became the basis for the development of theoretical framework of the study discussed in the next chapter.

CHAPTER FOUR: RESEARCH THEORETICAL FRAMEWORK

4.1 Overview

In this study I examined student learning of information skills as experienced and perceived by university teachers, librarians, and students who engaged in student information skills programmes in the context of a Malaysian public university. While the previous chapter discusses aspects of student learning of information skills in Western higher education, this chapter explains the development of the theoretical framework that guided the initial understanding of student learning of information skills and the design of my study. This chapter covers the phases of information skills studies, locating student learning of information skills in a community of practice and conceptualizing student learning of information skills within in the community of practice.

4.2 Phases of Information Skills Studies

Information skills has been studied around the world within the contexts of schools (e.g., Abdullah, Zainab, & Yu, 2006; Limberg, 1999), higher education institutions (e.g., Abdullah et al., 2006; Fisher, Landry, & Naumer, 2007; Iannuzzi, 1998), workplaces (e.g., C.Bruce, 1999; Mutch, 1997), and communities (e.g., Bundy, 2002; Dutta, 2008; Jager & Nassimbeni, 2007). However, as an evolving discipline of knowledge, information skills studies could be categorized further into four phases or periods (Bruce, 2000).

Firstly, information skills studies during the precursor period (1980s) were characterized by the seed of information skills studies that emerged in the form of the information skills and bibliographic instruction movement. The studies in this period focused on the development of information skills models for classroom learning in various educational settings, which were later followed by similar studies in workplace and community settings. Secondly, information studies during the experimental period (1990-1995) were characterized by the development of attributes and conceptions of information skills, and the relationship between information skills and student learning. Thirdly, studies during the exploratory period (1995-1999) were oriented toward re-

examining and questioning existing paradigms or perspectives that underpinned information skills studies during the precursor and experimental periods. Among others, various studies in the exploratory period criticized paradigms such as cognitivism, radical constructivism, and critical perspectives and their impact on the way how information skills was studied and understood. Fourthly, Bruce (2000) projected that, during the evolving period (post-2000), studies in information skills would focus on information skills' acquisition and application in the context of workplace and community learning using various anti-positivism perspectives.

Set in the evolving period (post-2000s), my study employed an anti-positivism perspective (i.e., communities of practice), to understand student learning of information skills from multiple perspectives within higher learning communities; namely higher education teachers, librarians and students.

4.3 Locating Student Learning of Information Skills within Communities of Practice

Although earlier studies in student learning of information skills in western higher education were predominantly underpinned by the communication and cognitive psychology theories (Kapitzke, 2003; Marcum, 2002), as alternatives to the existing abilities-based definitions of information skills, Kapitzke (2003), Marcum (2002) and Williams (2001) employed various constructivist perspectives to challenge the view of information literacy being a set of skills or abilities that could be transmitted to students via, or during, information skills programmes. Recent literature shows that a range of constructivist perspectives such as ecology (e.g., B. C. Bruce & Hogan, 1998; Marcum, 2002), critical (e.g., Harris, 2008b), learning communities (e.g., Harris, 2008a), and relative subjectivity (C. Bruce, 1997) have been used to understand the phenomenon of student learning of information skills in higher education. What these perspectives were telling us is that student learning of information skills could be located either in students' personal or social domains, or in the interplay between the two. An increasing number of studies situated further student learning of information skills within certain contexts, such as student 'information grounds' (e.g., Fisher et al., 2007), knowledge disciplines (e.g., Elmborg, 2006a, 2006b; Elmborg, 2002, 2003; Grafstein, 2002; Simmons, 2005, 2007), future workplaces (e.g., Hoyer, 2011), communities of learning (Harada, Lum, & Souza, 2003; Langford, 2001, 2003; Simons, Young, & Gibson,

2000), and communities of practice (e.g., Harris 2008a; Harris, 2008b; Talja & McKenzie, 2007).

Instead of assuming communities as settings for planning and implementing student learning of information skills, Harris (2008b) was of the opinion that the lens of communities of practice required the examination of individual students participating in a social and "discursive practice" (Harris, 2008b, p. 431) of information use and creation that are valued as meaningful by students and their communities. Using the communities of practice lens, student learning of information skills could be viewed as "a complex choreography of identity, sense of place, and participation" (Clancey, 1997, p. 7) that is experienced by teachers, librarians and students as they engaged in student information skills programmes. In this sense the lens might be valuable to investigate the collaboration efforts between teachers and librarians that facilitate student learning of information skills in higher education (e.g. Bridgland & Whitehead, 2005; Bruce, 2001a; Buchanan, Luck, & Jones, 2002; Corrall, 2008; D'Angelo & Maid, 2004; Doskatsch, 2006; Harris, 2008a, Harris, 2008b; Henri, 1999; Horton, 2006; Iannuzzi, 1998; Nutefall, 2001; Secker & Price, 2004; Simons et al., 2000; Steinerová, 2001; Wright & McGurk, 2000).

Although the lens of communities of practice has been identified and discussed in the literature as a theoretical tool that could aid a deeper understanding of information skills learning, the lens has not yet been employed fully in studying information skills learning in higher education. With the exception of a few studies (e.g., Simons et al., 2000), existing studies that employed the lens of communities of practice came from outside the higher education context, such as investigating information skills learning within communities of older people (e.g., Aberton, 2006) and youth students (e.g., Hoyer, 2011), as well as youth workers in workplace contexts (e.g., Lloyd, 2006; 2006), and children in school context (e.g., Trace, 2007).

Existing studies on student learning of information skills in higher education have employed a range of constructivist lenses such as ecology (e.g., B. C. Bruce & Hogan, 1998; Marcum, 2002), critical (e.g., Harris, 2008b), learning communities (e.g., Harris, 2008a), relative subjectivity (C. Bruce, 1997), and genre theory (e.g., Simmons, 2005). However they often focus on a single perspective of the higher education community,

such as students (Kuhlthau, 1994), educators (C. Bruce, 1997), or librarians (Julien & Boon, 2002) with only a few studies attempting to capture the dual perspectives of the teacher–librarian, teacher–student, or librarian–student communities (e.g., Iannuzzi, 1998; Scales, Matthews, & Johnson, 2005; Wright & McGurk, 2000). To extend the understanding of student learning of information skills in higher education, this study employed the lens of communities of practice (Wenger, 1998) to examine student learning of information skills from the multiple perspectives of higher education teachers, librarians, and students as they engaged in student information skills programmes. I used the lens of communities of practice in this study because the lens allows student learning of information skills in higher education to be examined using the multiple perspectives of higher education teachers, librarians, and students. Furthermore, the lens is robust enough to capture the interplay of multiple memberships within the community of student learning of information skills at social, personal and interpersonal levels which might lead to a unique, deeper and holistic understanding of student learning of information skills in the context of higher education in Malaysia.

The lens of communities of practice (Wenger, 1998) could be traced to a seminal work on situated learning by Lave and Wenger (1991). The lens views that learning is situated in communities of practice, and thus a process of participation in communities of practice through a process of 'legitimate peripheral participation'—or learning by immersion in the communities as a part of the process of transforming new members into full members of the communities. Wenger (1998) described communities of practice as "a group of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis," (p. 4). Using the lens of communities of practice, the current study assumes that when a group of higher education teachers, librarians, and students engaged in student information skills programmes, they were developing a community for student learning of information skills. While participating in the community activities, teachers, librarians, and students would interact, construct, negotiate, and reify continuously the meaning of student learning of information skills. Following the notion of "nexus membership" (Wenger, 1998, p. 158), I assumed that members of the community were teachers, librarians, and students who were existing members of classrooms, knowledge disciplines, teacher, librarian, and student communities, while the memberships might vary from full, to peripheral, across the community. Using the

lens of communities of practice I was concerned with the construction of identities and learning trajectories of individual members of the community. As unique human beings, their participation or non-participation in student learning of information skills required them to engage or disengage in the community's activities at personal levels, i.e., thinking, feeling, knowledge, and effort. Wenger (1998) stated that their participation includes the experience of living, acting and interacting in the community, as well as developing, using, maintaining the community-shared resources such as documents, instruments, focus, and forms or structures of participation as they engaged or disengaged in the community's activities.

4.4 Conceptualizing Student Learning of Information Skills within a Community of Practice

Using the lens of communities of practice, I developed five research questions to assist my investigation and understanding of student learning of information skills in a public university in Malaysia. These questions are:

6. How do university teachers, librarians and students who engage in student information skills programmes in a Malaysian public university experience and perceive student learning of information skills?

7. What is the immediate context for student learning of information skills as experienced and perceived by the university teachers, librarians and students?

8. How do the university teachers, librarians and students experience and perceive the interplay of interpersonal factors in student learning of information skills?

9. How do the university teachers, librarians and students experience and perceive the interplay of social factors in student learning of information skills?

10. How do the university teachers, librarians and students experience and perceive the interplay of personal factors in student learning of information skills?

In order to answer these five research questions, I used the lens of communities of practice to guide my data-collection process. Firstly, Wenger (1998) conceptualized that learning is participation, reification, and the interplay of the participation and reification. Following Wenger's (1998) conception of learning, the examination of experience and perception of student learning of information skills of university teachers, librarians and students who engaged in student information skills programmes (the first research question) was conducted in the following aspects of student learning of information skills:

1. Various ways higher education teachers, librarians and students participate or engage in the student learning and programmes such as their membership, action, interaction and mutuality that they had experienced and perceived during their participation in the student learning and programmes.

2. Various types of reification that were developed and used by higher education teachers, librarians and students while participating in the student learning and programmes such as forms, objectives, email, phone calls, discussion, documents, and other instruments that signified their participation.

3. The interaction between participation and reification experienced and perceived by higher education teachers, librarians and students while participating in the student learning and programmes.

Secondly, Wenger (1998) identified that there are three pillars of communities of practice: joint enterprise, mutual engagement and shared repertoire that characterised the communities of practice. Using the lens of communities of practice, this study assumes that, when a group of higher education teachers, librarians, and students engaged in student information skills programmes, they were developing a community of practice for student learning of information skills—the immediate context for student learning of information skills. This study also assumed that, while participating in the community activities the university teachers, librarians, and students would interact, construct, negotiate, and reify continuously the meaning of student learning of information skills. Respectively, to investigate the immediate context for student learning of information skills (the second research question) and the interplay of interpersonal factors in student learning of information skills (the third research question), my study examined the following aspects of student learning of information skills:

1. Joint enterprise: Various negotiated enterprise, mutual accountability, interpretations, rhythms, local response experienced and perceived by university teachers, librarians, and students while engaging in the student information skills programmes.

2. Mutual engagement: Various forms of engaged diversity, doing things together, relationships, social complexity, and community maintenance developed and maintained by higher education teachers, librarians, and students while participating in the programmes.

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3. Shared repertoire: Various stories, artifacts, styles, tools, actions, historical events, discourses, concepts created, shared and used by higher education teachers, librarians, and students taking part in student information skills programmes.

Thirdly, Wenger (1998) identified several identifiers for examining social engagement, enterprise and artifacts of learning in communities of practice. Following the social identifiers, my study examined the interplay of social factors in student learning of information skills (the fourth research question) via investigating the following aspects of student learning of information skills:

1. Various evolving forms of mutual engagement in the courses such as what helps and what hinders university teachers, librarians and students in engaging in the student learning or, as Wenger (1998) explained, "how they establish who is who, who is good at what, who knows what, who is easy or hard to get along with" (p. 95).

2. The various ways these people understand and tune their enterprise in student information skills programmes, such as how they go about "aligning their engagement with it, and learning to become and hold each other accountable to it; struggling to define the enterprise and reconciling conflicting interpretations of what the enterprise is about." (p. 95)

3. The different ways university teachers, librarians and students develop their repertoire, styles, and discourses, such as how they react to "renegotiating the meaning of various elements; producing or adopting tools, artifacts, representations; recording and recalling events; inventing new terms and redefining or abandoning old ones; telling and re-telling stories; creating and breaking routines" (p. 95).

Finally, Wenger (1998) identified several markers for discerning the personal identity construction within the communities of practice: negotiating experience, membership and learning trajectory. Using Wenger's markers for personal identity construction in the communities of practice, my study examined the interplay of personal factors in student learning of information skills (the fifth research question) by investigating the following aspects of student learning of information skills:

1. Various negotiated identity experienced and perceived by university teachers, librarians and students who engaged in student information skills programmes.

Specifically Wenger (1998) said that the identity emerges as "we encounter our effects on the world and develop our relations with others" (p. 151) which exists "in the constant work of negotiating the self" (p. 151) as we give meaning to our participation and reification such that Identity "is not an object, but a constant becoming" (p. 154).

2. Various negotiated memberships experienced and perceived by university teachers, librarians and students who engaged in student information skills programmes. Wenger (1998) said that "…our membership constitutes our identity, not just through reified markers of membership but more fundamentally through the forms of competence that it entails" (p. 152).

3. Various negotiated learning trajectories experienced and perceived by university teachers, librarians and students who engaged in student information skills programmes. Among others, Wenger (1998) explained that the learning trajectories are "not a path that can be foreseen or charted, but a continuous motion—one that has a momentum of its own in addition to a field of influences. It has coherence through time that connects the past, the present, and the future" (p. 154). Furthermore Wenger identified five types of trajectories: peripheral, inbound, insider, outbound, and boundary trajectories that guide this study to examine the learning trajectories.

4. Various nexus of multi-memberships experienced and perceived by university teachers, librarians and students who engaged in student information skills programmes. Wenger stated that nexus multi-membership was about our belonging "to many communities of practice…some as full members, some in more peripheral ways. Some may be central to our identities while others are more incidental. Whatever their nature, all these various forms of participation contribute in some way to the production of our identities" (p. 158). Wenger stated that identity entails the experience of multi-membership and the "work of reconciliation necessary to maintain one identity across boundaries" (p. 158).

5. Various senses of belonging, defined globally but experienced and perceived locally, by university teachers, librarians, and students in student information skills programmes. Wenger (1998) stated that "In the same way that a practice is not just local but connected to broader constellations, an identity—even in its aspects that are formed in a specific community of practice—is not just local to that community" (p. 162).

4.5 Summary

This chapter located the study of student learning of information skills as experienced and perceived by higher education teachers, librarians and students on the continuum of existing studies on information skills learning. This chapter also explained how the lens of communities of practice could help us to deepen our understanding about student learning of information skills in higher education. Lastly, this chapter conceptualized student learning of information skills in higher education using the lens of communities of practice which had helped the study to take appropriate theoretical and practical positions to examine the features of student learning of information skills and the interplay of social, and personal and interpersonal factors in student learning as experienced by university teachers, librarians and students in Malaysia.

CHAPTER FIVE: RESEARCH DESIGN AND IMPLEMENTATION

5.1 Overview

This study examined student learning of information skills as experienced and perceived by university teachers, librarians, and students who engaged in student information skills programmes in a Malaysian public university. This chapter explains aspects of the research design and implementation, such as its philosophy, approach, setting, participants, data-collection methods, data analysis and management and quality monitoring that were employed by the study to answer the following research questions:

1. How do Malaysian university teachers, librarians and students who engaged in student information skills programmes experience and perceive student learning of information skills?

2. What is the immediate context for student learning of information skills as experienced and perceived by the university teachers, librarians and students?

3. How do the university teachers, librarians and students experience and perceive the interplay of interpersonal factors in student learning of information skills?

4. How do the university teachers, librarians and students experience and perceive the interplay of social factors in student learning of information skills?

5. How do the university teachers, librarians and students experience and perceive the interplay of personal factors in student learning of information skills?

5.2 Research Philosophy

Crotty (1998) highlighted the need for researchers to state their epistemological position—how the would-be knower(s) (researchers) gain knowledge of the reality, as this influences their choice of research design and their research questions. My intention in this study was to gain a deeper understanding of student learning of information skills in higher education using multiple perspectives of teachers, librarians and students involved in student information skills programmes. Based on my intention, I identified my study with interpretivism and constructivism, and from this stance I approached my three research questions. Interpretivism views reality as the social "product of processes

by which social actors together negotiate the meanings for actions and situations" (Crotty, 1998, p. 10). From this position, student learning of information skills was assumed in the study as the social construction of participation, interaction, and negotiation of higher education teachers, librarians and students as they engaged in student information skills programmes.

From this interpretivist position, I employed a constructivist position as my study's epistemological stance which assumed that the reality being studied was part of the would-be knower(s) or researchers and relative to participants' individual experiences and contexts. Using this stance, I developed my knowledge of student learning of information skills based on my engagement in student information skills programmes and my interaction with the teachers, librarians and students involved in the programmes in the contexts in which the programmes were conducted. In this sense, instead of being "an expert who passed judgment" (Creswell, 1998, p. 18) on the reality constructed by the study's participants, my role was to become a "passionate participant…" who "actively engaged in facilitating the multivoice reconstruction" (Guba & Lincoln, 1994, p. 215) of student learning of information skills as experienced and perceived by the teachers, librarians and students. Accordingly, my study was concerned with "viable" knowledge about the reality being researched, and thus was not concerned with "a replica or picture of reality" (Glasersfeld, 1981, p. 5). In 1995 Von Glasersfeld explained further that viable knowledge is those "concepts, models, theories….that… prove adequate in the contexts in which they were created" (cited in Crotty, 1998, p. 7).

5.3 Research Approach

From my interpretivist and constructivist position, I assumed that the reality being studied was part of social construction of individual participants in their natural settings, and identified qualitative research as the appropriate approach for this study. Qualitative research approach was "an interpretative, naturalistic approach to its subject matter" and "…study [of] things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them" (Denzin & Lincoln, 2000, p. 3). A close relationship between my research philosophy and approach was supported by Merriam (2009) who viewed that the qualitative research approach is underpinned by an interpretivist position that assumes reality is "socially constructed" (p. 8) as well as "holistic, multidimensional, and ever-changing" (p. 213) in nature.

Merriam (1998, p. 8) also reinforced my view about how I could construct my understanding about student learning of information skills when she said that the qualitative research approach requires researchers to experience the phenomenon and environment in which the phenomenon took place, interact with social actors who participated in the phenomenon, and focus on "the process, meaning and understanding" (p. 8) that were experienced by the social actors during their engagement in the phenomenon. In this sense, instead of observing a single reality of interpretation of student learning of information skills, the researcher was required to examine the multiple realities or interpretations of those engaged in the phenomenon and, later, develop an overarching interpretation of the phenomenon.

Although the qualitative research approach and design has been widely employed to investigate student learning of information skills in higher education in the west (e.g., Boon et al., 2007; C. Bruce, 1997; Doyle, 1992; Lupton, 2003; Maybee, 2007), the research approach was uncommon in investigating student learning of information skills in Malaysia as most previous studies employed the quantitative research approach (e.g., Abang Ismail & Pui, 2006; Abdullah et al., 2006; Edzan, 2007). Additionally, the qualitative research approach has been used widely to investigate single and dual perspectives of educators and librarians (e.g., Boon et al., 2007; Bruce, 1997; Doyle, 1992), and students (e.g. Lupton, 2003; Maybee, 2007) with regard to student learning of information skills in higher education. However, it was still uncommon for these studies to investigate student learning of information skills using the multiple and concurrent perspectives of teachers, librarians and students involved in student information skills programmes. Accordingly, I believed that new studies that employ a qualitative research approach in examining the multiple perspectives of social actors such as these would complement the existing research practices in the context of Malaysia as well as deepen our understanding of student learning of information skills in higher education.

Following several strategies that had been identified by Bogdan and Biklen (2007), Patton (2002) and Merriam (2009) I designed my qualitative research approach to guide my data-collection process that is illustrated in Figure 2. Among the strategies that I used in the design of the research approach are engaging real and information-rich

cases, employing flexible and emergent research design, involving my personal engagement and experience, exploring the multiple perspectives of those who participate in the reality under study, engaging in inductive and creative ways of analyzing and synthesizing data, developing unique and overarching findings of cases and across cases, and locating the findings within the social, historical and temporal contexts in which the reality was constructed and negotiated.

As illustrated in Figure 2, the design of my study indicated that, in order to answer the three research questions, I employed interpretivist and constructivist views of understanding and gaining knowledge of the reality under study. Since the philosophy and approach of my study were concerned with the context in which the reality was constructed and the multiple perspectives of social actors who participated in the reality, I conducted the study in the context of one public university in Malaysia and involved teachers, librarians, and students who participated in student information skills programmes there. In order for me to personally engage with and experience the programmes, the research design indicated further I needed to collect data through observing the programmes themselves, and examining related teaching and learning artifacts found in the programmes. Additionally, in order to access the individual experience of social actors involved in the reality, my research design further required interviewing those involved in the observed programmes. My research design further indicated that I analyze qualitative data using several strategies such as bucket, open, analytical and coding and cross-matrices. To construct my understanding about student learning of information skills in higher education, my research design indicated that I began my study with an initial understanding of the student learning and the context where it occurred (discussed in Chapters two to four), before I reconstructed the student learning based on my data analysis (discussed in Chapters six to ten). My research design also required that I identified the key findings of my reconstruction and situated these findings within relevant literature, before finally reflecting on my reconstruction, and research process and experience (discussed in Chapter eleven).

5.4 Research Setting

Having considered the origin and approach of the study, I conducted this study in one of the public universities in Malaysia where I was a teacher before I left Malaysia to
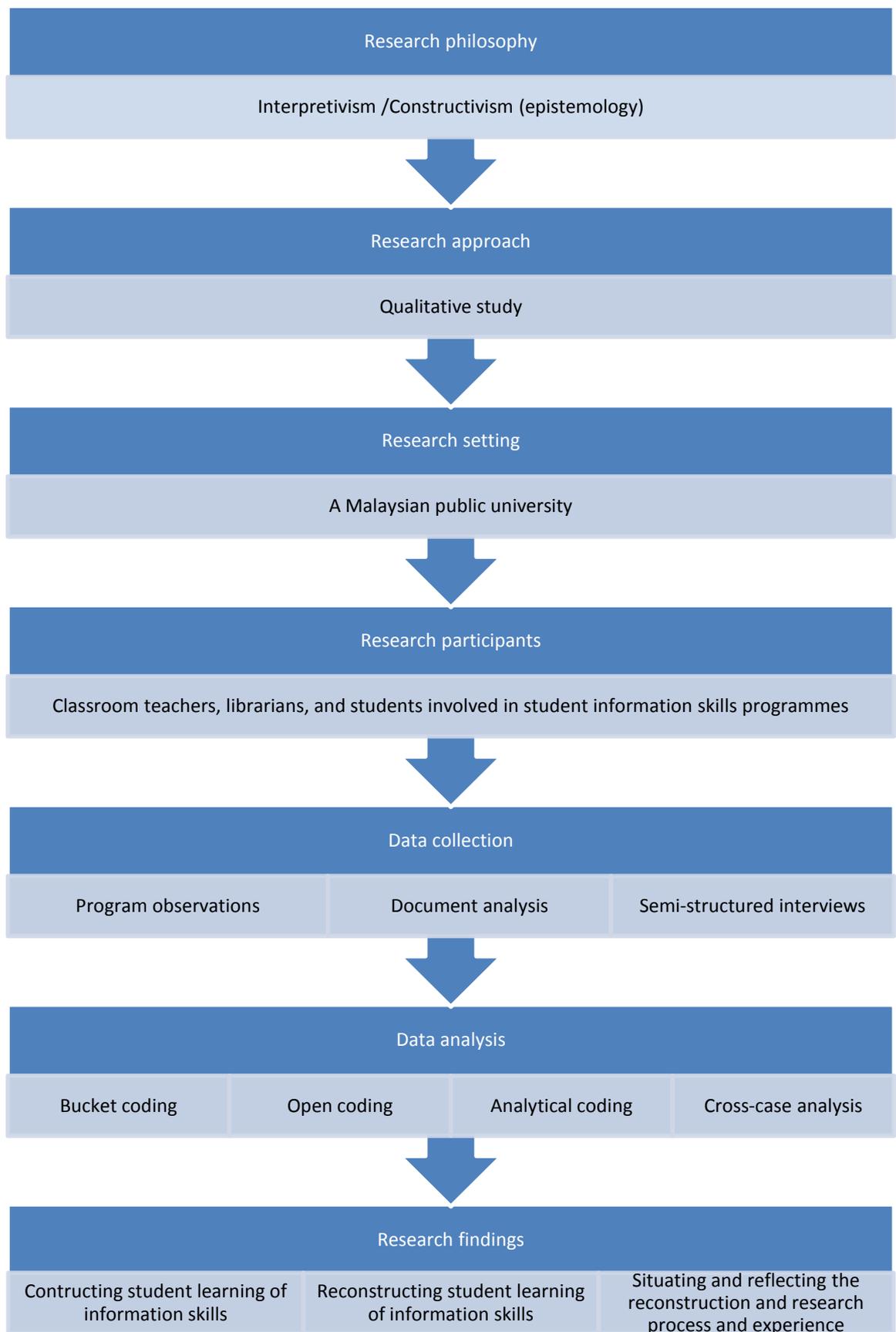
Figure 2: Qualitative research design of the study

further my postgraduate study in New Zealand. However, the main reason for selecting the university was due to the willingness of the head of the university library to provide written access entry for me to conduct the study in the library. Such access entry was essential to enable working closely with the university librarians in order to identify relevant student information skills programmes and recruit my research participants. The university was officially opened on the 18th of May, 1970 (Yaakub, 1970), and is located on the outskirts of Kuala Lumpur, the capital city of Malaysia. Its establishment can be traced to the movement of Malay intellectuals who lobbied for the development of a national university that integrates Malay education into the university education system and uses Malay language as the medium of instruction (Kamaruddin, 2006). Although the movement began in the 1920s (Salleh & Said, 1991), years before Malaysia attained independence in 1957, it was only in the late 1960s that serious and collaborative efforts between Malay and some non-Malay people combined to develop the university. This group of people formed a national movement that demanded the government set up a national Malaysian university and began to collect public donations for that purpose (Berita Harian, 1968a, 1968b, 1969).

However, the catalyst for the university's establishment was an open confrontation between Malay and Chinese people on the 13th May 1969, which is now known as the Black 13th Event. The confrontation happened for a number of reasons, including the huge economic gap between the Malay and Chinese people, which was attributed to the previous inequitable British education and economic policies (Kamaruddin, 2006). Both the confrontation and the university symbolize a new era for Malay people who hoped to improve their low economic status through university education. Accordingly, the university was initially established for Malay students, used Malay language as the medium of instruction and incorporated Malay education into its learning system. With such a history and mission, the university became a symbol for the economic and education progress of Malay people in Malaysia and in 1970 began its operation with three faculties of Arts, Science and Islamic Studies (Salleh & Sid, 1991). Now the university has expanded into 11 faculties, 13 research institutes, a teaching hospital and 15 research centres and offers multi-disciplinary education programmes at diploma, degree, masters and doctor of philosophy levels. With current enrolment of 17,203 undergraduate students and 5,322 postgraduate students, and 1,525 foreign students from 35 countries (Universiti Kebangsaan Malaysia, 2008), the institution today is one

of the top research universities in the country and offers higher education qualifications for Malaysians and foreigners.

Following the university expansion, the university library provided and maintained information sources, services, and information technology and communication-based facilities that aimed to facilitate teachers, researchers and students to better engage in teaching, learning and research activities (Perpustakaan Universiti Kebangsaan Malayisa, 2008). The focus of the study was information skills programmes which were listed among the services that are offered by the university to the students. Following the conceptual framework of the study, the study's unit analysis was student information skills programmes that were jointly engaged in by classroom teachers, librarians and students.

5.5 Research Participants

Working with two librarians who were in charge of the programmes, I identified schedules for student information skills courses that involved classroom teachers, librarians and students. With that information, I selected six student information skills programmes from four undergraduate classes and two postgraduate classes following Merriam (2009) who advocated the use of maximum variation in selecting participants. These programmes were selected because they involved teachers, librarians, and students from various backgrounds, academic programmes and departments which helped me to examine the multiple realities of student learning information skills as experienced by multiple social actors that construct the realities. The following section explains the recruitment process of the librarian, teacher and student participants.

Librarian participants

Upon receiving permission and access to work with the university library at the beginning of the new university semester, I met two librarians who were responsible for conducting student information skills in order to discuss my study as well as to gain information about types of student information skills programmes offered by the university library. During the meeting, the librarians informed me about two other librarians who were also involved in facilitating the programmes. Upon the identification of the (now four) librarians, I met them individually to recruit them as my research participants. During the meetings, I had explained the aim and nature of the study, invited them to participate, distributed participant information sheets and consent forms to them and explained the data-collection process that would involve them and

their programmes. One of the librarians asked if this study would evaluate their teaching practices, to which I responded that this was not the purpose as the study aimed to examine the multiple perspectives of student learning of information skills in higher education. Finally, at the end of the meetings, the four librarians agreed verbally to participate in the study (their profiles are shown in Table 9). For the purpose of research ethics, I used pseudonyms to protect their privacy and confidentiality. Although the librarians differed in their age, qualifications, and position, all of them were female and Malay.

Table 9: Profile of librarian participants

No	Librarians	Age	Qualification	Position
1	Azi	35-40	Pure science degree and diploma in Library and Information Science	Librarian
2	Lia	40-45	Social science degree and diploma in Library and Information Science	Librarian and management position
3	Mia	35-40	Degree and master in Library and Information Science	Librarian and management position
4	Sal	30-35	Degree in Library and Information Science	Librarian

Teacher participants

Working with two librarians who were in charge of the student information skills programmes, I then selected five classroom teachers involved in the student information skills programmes that I intended to observe (see profiles in Table 10). For the purpose of research ethics, I used pseudonyms to protect their privacy and maintain confidentiality. All the teachers were Malay and varied in gender, age, position and knowledge discipline. Although I was hoping to interview non-Malay teachers in this study, I was unable to do that because during the recruitment period, all student information skills programmes run across classroom learning were requested by Malay teachers. This was not surprising as Malay teachers outnumbered non-Malay teachers in the university. Additionally, one of the teachers, Sam, was involved in two programmes: research methods undergraduate and postgraduate classes.

To invite them as my research participants, I had contacted them via both email and telephone in the middle of the university semester when I had half-completed my observation and examination of student information skills programmes and their teaching and learning resources respectively. Although it was evident during that time

that these teachers were pressed for time, they were interested to share their experience and views regarding their engagement in student information skills courses.

Table 10: Profile of teacher participants

No	Teachers	Gender	Age	Position	Knowledge Discipline	Courses
1	Ana	Female	50-55	Associate Professor	Pure science	Academic writing for undergraduate students
2	Nora	Female	40-45	Senior lecturer	Social science	Information technology for postgraduate students
3	Onn	Male	56-60	Professor	Pure science	Academic writing for undergraduate students
4	Sam	Male	45-50	Associate Professor	Social science	Research methods for undergraduate and postgraduate students
5	Wani	Female	35-40	Associate Professor	Pure science	Academic writing for undergraduate students

Student participants

Due to the one-off nature of the student information skills programmes and insufficient information about students who would or would not attend the selected programmes, I decided to get assistance from the librarians who would be facilitating the selected invite the researcher to talk about the programmes. After discussing it with the librarians, we agreed that at the beginning of the selected programme, the librarians would study for 10 minutes. During this period, I also sought students' verbal and collective agreement to be observed throughout the programmes, invited them for an interview at pre-determined times and distributed participant information sheets and consent forms to the students. I also informed the students that the interview was confidential and their participation or non-participation in the interviews would not entail any advantages or disadvantages to them. To respect students' privacy and confidentiality, I asked students to complete, turn over and leave their consent forms on their table or seat, to be collected after the programmes had ended.

The profile of my student participants is shown in Table 11. For the purpose of research ethics, I used pseudonyms to protect the participants' privacy. The 22 participants represented students from six student information skills programmes that I had observed earlier. Although I was hoping for a balance of Malay and non-Malay student participants, except for Cheng and Leng who were Chinese students, and Kan, an Indian student, the rest of the participants were Malay. Again, I was not surprised at this situation as Malay students outnumber Chinese and Indian students in the university, although the ratio might vary across departments and faculties.

Although I expected that some students might not agree to be observed, no students objected to the observation. It might have something to do with the way the librarians warmly welcomed me at the beginning of the programmes, which made the students felt that I was an acceptable member of the programmes. Using this strategy, I was able to observe six student information skills courses and obtained 30 consenting students willing to be interviewed at the end of the programmes. While these forms were not a binding agreement for students to be interviewed in the study, they provided me with student background information and contact details that enabled me to identify, select and contact student participants for an interview at the later stage of data collection.

Table 11: Profile of student participants

No	Students	Gender	Ethnic	Age	Education programme	Knowledge Discipline	Courses
1	Cheng	Male	Chinese	20-25	Bachelor	Pure science	Academic writing
2	Feza	Female	Malay	20-25	Bachelor	Pure science	Academic writing
3	Fazil	Male	Malay	20-25	Bachelor	Pure science	Academic writing
4	Hani	Female	Malay	20-25	Bachelor	Pure science	Academic writing
5	Kan	Female	Indian	20-25	Bachelor	Pure science	Academic writing
6	Lily	Female	Malay	20-25	Bachelor	Pure science	Academic writing
7	Leng	Female	Chinese	20-25	Bachelor	Pure science	Academic writing
8	Razak	Male	Malay	20-25	Bachelor	Pure science	Academic writing
9	Amy	Female	Malay	20-25	Bachelor	Social science	Research methods
10	Kam	Female	Malay	20-25	Bachelor	Social science	Research methods
11	Kay	Female	Malay	20-25	Bachelor	Social science	Research methods
12	Muz	Male	Malay	20-25	Bachelor	Social science	Research methods
13	Raz	Male	Malay	20-25	Bachelor	Social science	Research methods
14	Awatif	Female	Malay	26-30	Master	Social science	Information technology
15	Joe	Male	Malay	26-30	Master	Social science	Information technology
16	Karin	Female	Malay	26-30	Master	Social science	Information technology
17	Wina	Female	Maly	26-30	Master	Social science	Information technology
18	Jannah	Female	Malay	36-40	Master	Social science	Research methods
19	Maya	Female	Malay	26-30	Master	Social science	Research methods
20	Naim	Female	Malay	30-35	Master	Social science	Research methods
21	Nori	Female	Malay	36-40	Master	Social science	Research methods
22	Rosli	Male	Malay	36-40	PhD	Social science	Research methods

Near the end of the university semester, just after I had completed my observation of student information skills programmes, examination of the teaching and learning resources involved, and development of interview protocols for librarian, teacher and student participants, I contacted 30 students who had provided their consent forms earlier. Out of 30 students, eight were unwilling to participate in the interview because they were busy completing classroom assignments and preparing for final examinations, while the rest of the students agreed to be interviewed at a convenient time. Although my decision to conduct the interviews might have contributed toward the withdrawal of

the eight students, I believed such timing provided ample time for my student participants to apply and reflect on the knowledge and skills that they had acquired during their information skills programmes, and thus provide the study with comprehensive and holistic accounts of student learning of information skills.

5.6 Data-collection Methods

In order to examine student learning of information skills in its natural setting, I had immersed myself in the university from June until November 2008. As illustrated in Figure 2, the data-collection process was conducted in three phases, observing six student information skills programmes, examining the programmes' teaching and learning resources and finally interviewing teachers, librarians and students involved in the six programmes, explained below.

Observation of student information skills programmes

My data-collection phase began with observation of six information skills programmes because the observation enabled me to access direct and real data (Robson, 2002) related to student learning of information skills as student learning evolves in its natural setting. Observation was employed in this study as "an initial phase where other methods will take over" (Gillham, 2000, p. 48) which provided the study with an open and unbiased window for me to identify various aspects of student learning of information skills and information skills programmes that would be investigated further during the next stage of data collection (Silverman, 2006). I employed the approach of "unobtrusive observation" (Robson, 2002, p. 310) or "observer as participant" (Merriam, 2009, p. 124) that required me to inform participants and seek their consent, as well as to interact with them to develop "…an insider identity" (Merriam, 2009, p. 125), but not to be involved in the programmes' activities. I chose this approach because I believed that it minimized the disturbance of any social relation that existed between the teachers, librarians and students involved, while at the same time providing an opportunity for the researcher to create rapport with the librarians and students and recruit them for the coming interview sessions.

While I had interacted and worked with the librarian participants long before they conducted their student information skills programmes, it was a different story with the students; I had just 10 minutes to create rapport with them at the beginning of the observed programmes. However, the warm welcome and introduction by the librarians

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helped me to gain an insider identity which gained me acceptance by the students as a peripheral member of the programmes, someone who just sat at the back of the classes, observed and took notes of the programme being conducted. During the observation, I had focused my observation and took notes on the following aspects:

- Programme content
- Teaching and learning activities of the programmes
- Teaching and learning materials used
- Any interactions between and among librarians and students observed during the programmes.

Analysis of Related Documents

During the second phase of my data collection, I examined teaching and learning materials employed by librarians and students during the programmes. Following my observation of student information skills programmes, I identified and examined the following materials:

- PowerPoint slide presentations, Library of Congress Subject Heading and library handbook and pamphlets used by librarians
- Student information skills assignments where available
- The library booklet, web page, cataloging system, and internal and internal online databases
- An evaluation form for information skills programmes.

Examining these materials helped me to gain a deeper understanding of the aims, components and running of the observed programmes. Based on my analysis of these resources, I had found the following broad themes which I incorporated into the development of my interview protocols:

- Nature of student learning of information skills
- Learning outcomes for student learning of information skills
- Multiples activities for student learning of information skills

However, qualitative studies are dynamic and emergent in nature. Although earlier I had planned to undertake the phases of my data collection in a linear way in terms of execution and timing, I found myself concurrently examining relevant materials while interviewing my research participants. For example, when teachers, Onn and Wani,

spoke during their interviews on how the Malaysian Qualification Framework somewhat affected their classroom approaches towards engaging students in information skills programmes, I knew that I needed to examine documents related to the framework in order to obtain background information about student learning of information skills in the university. Similarly when librarians backed up their statements with certain documents during our interviews, I was also given access to the documents during the interviews. Accordingly, I also examined the following materials in addition to learning materials for student information skills programmes:

- Completed student information skills assignments and grades that were shown to me during my interviews with two librarians
- Classroom syllabus and completed classroom assignments which were shown to me during my interview with one of the teachers
- University working documents related to the foundation and implementation of outcome-based learning in the university
- Government documents related to the Malaysian Qualification Framework and Research University.

Semi-structured interview

My final phase of data collection was interviewing teachers, librarians and students who were involved in the observed programmes. Using interview protocols that were developed based on my observation and examination of student information skills programmes and related materials for student learning of information skills within the university, my aim was to triangulate data that I had gathered earlier during the observation and examination of the programs and materials with the personal experience and perception of those engaged in the programmes. The interview protocols for librarians, teachers and students are attached in Appendix 1, Appendix 2, and Appendix 3 respectively, that provided guidelines for me in conducting the following interviews:

- Four individual and one paired interviews with four librarians
- Five individual interviews with the five teachers
- 1One individual, four paired and one trio interviews with 22 students.

Specifically, I employed semi-structured interviews in this study because I believed these could help me to identify, acknowledge and incorporate aspects of student

learning of information skills that were unique to participants' experiences and contexts. Additionally I believed that the interviews enabled me to explore aspects of the student learning that were unrevealed during my observation and examination of the programmes and relevant materials that would be unexpectedly raised by my interviewees. In this respect, the semi-structured interviews provided "rigor, breadth, complexity, richness and depth" (Denzin & Lincoln, 2000, p. 5) to the construction of student learning of information skills as experienced and perceived personally by multiple social actors participating in the student learning. Among the personal aspects that I had focused on during my interviews are views, feelings, tacit knowledge, motives, experiences and practices of my research participants related to student learning of information skills and information skills programs which Maxwell (2005), Robson (2002), Patton (2002) indicate would be able be accessed via semi-structured interviews. To access these aspects, I employed several strategies during my interviews that were suggested by Merriam (1998) which consisted of the following:

- Hypothetical and ideal positions;
- Devil's advocate;
- Interpretative questions;
- Multiple, leading and yes-or-no questions.

While the first three interview strategies worked successfully with postgraduate students and final-year undergraduate students, all second-year undergraduate students interviewed in this study were more comfortable with multiple, leading, or yes-or-no questions. Additionally, although I had planned initially to conduct personal interviews with all participants, following their preference and time constraints, in the end I conducted three paired interviews and a trio interview with students, as well as a paired interview with two librarians, when one of them unexpectedly joined my interview with one of the librarians in the university library. Additionally I found that the paired and trio interviews helped young and inexperienced undergraduate students to overcome their shyness, while they assisted final-year undergraduate and postgraduate students and librarians to better engage in the interviews as they shared, queried and explained each other's understandings, feelings and experiences about their information skills learning and programmes. In this sense the pair and trio interviews helped me to triangulate the participants' stories, and clarified any discrepancies between individual stories and interpretations.

All the interviews were conducted in the Malay language and most of them were conducted within 60 minutes, with the shortest and longest interview lasting for 35 and 150 minutes, respectively. After each interview, whenever possible, I immediately wrote a short note about new or interesting insights that I gained.. The notes helped me to relate each current interview with previous interviews and highlight themes that were needed to be explored in later interviews. To safeguard the accuracy of the interview data and to familiarize myself with the data, I transcribed the interviews myself and emailed the transcripts to participants and informed them that they could make changes to any parts of the transcripts if they wish to before I integrated the transcripts into my data analysis. For the purpose of reporting the data-analysis outcomes, I used a professional service to translate selected excerpts into English.

5.7 Data Analysis and Management

Initial analysis from my observation and examination of information skills programmes and related materials were integrated into my interview protocols as well as into the description of the background of the study and research setting. However, to deepen my understanding on the personal experience and perception of the people involved in student learning of information skills, I cross-analyzed all interview transcripts using the qualitative data analysis approach by Merriam (2009) and Miles and Huberman (1994) that suggest using my research questions to guide my data analysis process.

Guided by the research questions, I read each interview transcript and identified references or excerpts within the transcript that were relevant to my research questions. This approach is also known as "broad-brush or bucket coding" (Bazeley, 2007, p. 67), which allows the researcher to read, identify, reflect on, select and chunk references within transcripts into general topic areas that reflect the research questions. I used this approach because I preferred to work as a "lumper" (Bazeley, 2007, p. 67) or those who work with big pictures first before going into the details. Following my research questions, I parked the identified references or excerpts into the following four broad topic areas or categories:

- Participants' engagement in student learning of information skills;
- The community of practice for student learning of information skills;

- Social and interpersonal factors that interplayed in student learning of information skills;

- Personal factors that interplayed in the participants' engagement.

Reading the references within each broad category, I openly coded each reference into its descriptive category(s) and parked them under their descriptive category(s). Open coding is "a way of classifying and then tagging text with codes, or of indexing it, in order to facilitate later retrieval" (Bazeley, 2007, p. 66). According to Merriam (2009), this is the first stage of developing themes before establishing analytical or axial coding for the references. Later I developed my analytical or axial codes by comparing and contrasting the descriptive codes, and later grouped the descriptive codes with common attributes under parent categories (parent nodes) or under sub-categories (child nodes) of the parent categories. While the descriptive codes categorize the references independently from each other, Merriam (2009) stated the analytical codes sort the references into a meaningful "classification system" (p. 180) that suggests patterns and regularities for the phenomenon under study. Using facilities in the Nvivo program, I compared and contrasted the emerging analytical codes or nodes across the perspectives of teachers, librarians and students to come out with patterns and regularities. Selected samples of Nvivo tree nodes of the study are provided in Appendix 4.

Lastly, I cross-checked the emerging patterns with data that I had gained from my observation, examination and interviews, related documents on student learning of information skills in the university and people engaged in the programmes by reading my observation and examination notes and interview transcripts and comparing them with the pattern that had emerged in my analytical codes. This exercise is often referred to as cross-cases matrices (Miles & Huberman, 1994) in which the researcher triangulates emerging patterns or themes in one participant or a group of participants with other participants or groups of participants, or those in one data source with other data sources.

During the early stage of my data analysis, I used the Nvivo program to help me to organize my data analysis via employing the tree nodes facility in the program. Using that facility, I developed codes or nodes for general topic areas that could accommodate my research questions and located or parked the identified excerpts from my interview

transcripts under their respective codes(s) or node(s). In this sense I also found that the program was useful in helping me to develop, revise, organize and retrieve the emerging descriptive and axial codes or nodes as I continuously read and analyzed each transcript and became more familiar with the transcripts, references or excerpts, and codes or nodes.

Moreover, through comparing multiple excerpts within similar codes or nodes that came from multiple data sources, i.e., multiple participants, the program helped development of a cross-case analysis of my data and offer a deeper understanding of student learning of information skills. This helped with the findings discussed in Chapters 6 to 10. The recursive and emerging process of data analysis that I had experienced was what Miles and Huberman (1994) had emphasized when they stated that the revising, organizing and retrieving process of qualitative data was an essential task for qualitative researchers to undertake in order to validate their classification system or themes emerging from collected data.

5.8 Research Quality

The goal for the design and implementation of qualitative study was to establish trustworthy findings or findings that are persuasive enough for readers to accept seriously (Lincoln & Guba, 1985). Following Lincoln and Guba (1985) and Merriam (2009), I defined trustworthy findings in this study as findings that match the reality of the phenomenon under study and which are "consistent" with the data that I had collected during my fieldwork. I also posited that the notions of trustworthiness and consistency in qualitative studies are equivalent to the notions of validity and reliability traditionally introduced in quantitative studies (Lincoln & Guba, 1985; Merriam, 2009). Following Maxwell (2005) who said "validity is a goal rather than a product" (p. 105), I believed that trustworthiness in this study was the goal rather than an automatic result or feature of the study. Thus I followed Lincoln and Guba (1985) and Merriam (2009) who suggested several strategies that I could employ in my study in order to increase the trustworthiness of my research findings via monitoring aspects of credibility (internal validity), transferability (external validity), and consistency (reliability) of the process and findings of my study which are summarized in Table 12.

Firstly, while internal validity in a quantitative study concerns whether its findings match the reality that being investigated, in a qualitative study there is no single reality

that could be assumed about the reality being investigated. As a result, my study examined the multiple social actors' constructions or interpretations of student learning of information skills. As a qualitative researcher, I could increase the credibility or "internal validity" of my study by providing a holistic interpretation of the multiple perspectives of those engaged in the programmes in the context where the study was conducted (S. B. Merriam, 2009). As illustrated in Table 12, in this study I employed a few strategies to monitor the credibility of my research findings as advocated by Lincoln and Guba (1985) who advise that the interpretation of the multiple perspectives must be credible in the light of the data that the researcher had collected and presented in the study.

Table 12: Issues, questions and strategies of trustworthiness addressed in the study (adapted from Lincoln & Guba, 1985; Merriam, 2009)

Trustworthy issues of qualitative study	Key questions for qualitative study	Strategies to increase trustworthiness	Strategies employed in the study
Internal validity (credibility)	What is reality?	Triangulation	The researcher collected and compared data from various sources and perspectives
		Member checks	The researcher met and presented informally and verbally initial findings to a few teachers, librarians, and students who were willing to check the initial findings
		Adequate engagement in data collection	The researcher immersed herself in the research setting for almost six months to familiarize with and study the phenomenon
		Investigator's position/ reflexivity	The researcher acknowledged and stated her experiences, assumptions and role in the study before collecting data
		Peer examination/ peer review	The researcher presented her initial findings in various research seminars to get feedback from higher education communities of teachers, librarians and students
Reliability (consistency/ dependability)	Do the results make sense, and are they consistent with the data?	Triangulation	The researcher collected and analyzed data from various perspectives and data sources and cross-checked the emerging themes from different perspectives and data sources
		Peer examination/ peer review	The researcher presented her initial findings in various research seminar to get feedback from higher education communities of teachers, librarians, and students
		Investigator's position/ reflexivity	The researcher stated her experiences, assumptions and biases, and her role in the study in the thesis
		Audit trail	The researcher provided detailed accounts of her data collection and analysis in this chapter
External validity (generalizability) (transferability)	Do the results provide in-depth understanding of the particular?	Maximum variation	Where it was possible, the researcher selected research participants from various backgrounds, disciplines of knowledge, education programs and courses
		Thick description	The researcher provided descriptions of the setting, participants, findings and evidences in the thesis (Chapters 4, 5, 6, 7) to help readers relate to and assess the findings

Secondly, reliability in a quantitative study is concerned with the extent to which the research findings could be replicated in other studies, assuming that there is only one

true reality to be observed. However, as a qualitative researcher, I had assumed that there was no one true reality about student learning of information skills. Instead this study examined multiple realities about student learning of information skills constructed by multiple social actors engaged in student information skills programmes. Additionally, the realities were not static but were always in the state of becoming, as well as being dynamically influenced by the context in which the realities were being studied. Due to these reasons, I had found it was appropriate for this study to apply the notion of "dependability" or "consistency" (Lincoln & Guba, 1985) instead of the traditional concept of reliability. Consequently, in this study I employed a few strategies to monitor the dependability or consistency of my research findings (listed in Table 18).

Thirdly, traditional external validity concerns whether the research findings are applicable or generalizable to different contexts. This was not the goal of this study because its aim was to understand student learning of information skills within particular contexts. As such, the notion of transferability which Lincoln and Guba (1985) said was equivalent to the notion of external validity in quantitative studies was more suitable to this study. Accordingly, I believed the generalizability aspect of this study rests on the readers of this thesis report; those who would subjectively read and appraise the report (Rolfe, 2006) and extrapolate (Patton, 2002) the findings into their own unique context. However, as a qualitative researcher I was responsible for facilitating the transferability process by providing a clear description of the setting, participants, findings and their respective evidence, as suggested by Merriam (2009). Table 12 lists a few strategies that were employed to monitor aspects of generalizability and transferability of my research findings.

Lastly, Merriam (2009) highlighted ethical aspects of conducting studies as an integral part of increasing validity and reliability of the study. In this respect, this study followed a strict ethical data-collection procedure which was approved by the Auckland University of Technology Research Ethics Committee (ethics application number 08/98).

5.9 Summary

In this chapter I have explained the interpretivist/constructivist epistemological position of my study that underpinned the research project. I have also explained the process of identification and recruitment of research participants as well as the data-collection

methods that involved observation of six student information skills programmes, examination of material related to student learning of information skills in the university and interviews with five teachers, four librarians and 22 students involved in the programmes. This chapter also discussed the recursive process of analyzing qualitative data collected during the fieldwork study and strategies of monitoring research quality that were employed throughout the study in order to establish the trustworthiness of the research findings (discussed in Chapters 6 to 10).

CHAPTER SIX: THE ACTIVITY OF STUDENT LEARNING WITH INFORMATION

6.1 Overview

This chapter attempts to answer the first research question, i.e., how do Malaysian university teachers, librarians and students who engaged in student information skills programmes experience and perceive student learning of information skills? My data analysis of observations of student information skills programmes, examination of related documents and semi-structured interviews indicated that student learning of information skills is experienced and perceived by the university teachers, librarians, and students as engaging students in the activity of learning with information as opposed to the activity of learning of information-related skills as was assumed at the beginning of the study. My data analysis indicated further that the activity of student learning with information featured six steps: of students identifying information need, accessing, interacting and using information from multiple sources to articulate and reflect an understanding and the construction of the understanding. This chapter explains the features of the activity of student learning with information and how the university teachers, librarians and students engaged in each feature.

6.2 Step 1: Identifying Information Need

My data analysis highlighted that the activity of student learning with information begins with students identifying their information need. As discussed below, the participants further categorized the step into two main tasks; developing an information framework and identifying topic of inquiry.

Task 1: Developing an information framework

While my observations on student information skills programmes indicated that the activity of student learning with information began with students articulating their research topic into searchable keywords; teachers associated the first task of identifying information need with students developing an information framework. The framework helped students to identify specific goals for their independent study and the necessary

actions for attaining their goals. As explained by a teacher (Ana) below in the context of student development of literature reviews, the information framework was quite similar to a 'skeleton' that helps students to identify the outcome and processes of their independent study:

> *If they [students] just translated and later 'cut' and 'pasted' information [from journal articles] their writing would be incoherent. That is why it is important for us to have our own skeleton; only then will you know what you want to write. (Ana, a female academic writing teacher)*

However, some teachers might be unaware that a number of students face difficulty in identifying their information framework. One teacher (Wani) observed that some of her undergraduate students were unable to perform the task independently. Therefore, she stated that she employed a questioning approach to assist students in identifying their information need:

> *Yes! Students asked me how to do [this assignment]. So I asked them, 'what do you understand from this question?' What information was given to you? (Wani, a female academic writing teacher)*

Task 2: Identifying the learning topic

All participants agreed students needed to identify their learning topic before they could proceed to the next step of the activity. For example, a teacher, Ana, explained that students should develop their own 'skeleton' from a particular topic of learning that they plan to investigate and write about:

> *The skeleton comes from the students [themselves] ... This means, which topic do they want to investigate. It starts with an introduction with the question of 'what do you want to write?' Only then will the writing have a flow. (Ana, a female academic writing teacher)*

Another teacher (Nora) also emphasised the importance of students identifying their learning topic at the beginning of their activity of learning with information. Nora reflected that her postgraduate students could gain greater benefit from their information skills learning if they had identified a particular topic of inquiry that they planned to work with prior to the start of the programme. Nora said that the topic identification would enable students to participate with a sense of purpose, i.e., to identify and access specific information from multiple sources that would enable them to complete their term paper. Such a sense of purpose could lead them towards having active and purposive interactions with librarians, which Nora viewed as an effective measure of student information skills programmes.

It also emerged from the study that some postgraduate students experienced difficulty in identifying their topic of inquiry independently from their teachers, which suggested that they might benefit from their teachers' assistance. As stated below, a fresh postgraduate student (Wina) found that the activity was an uncertain and time-consuming process, and required much support from teachers:

> *I proposed a lot of [research] topics, but they were all rejected! My supervisor said the topics had already been researched widely. At the beginning, my supervisor said, 'You should complete your coursework first and you can discuss your research topic with me later.' But the thing is. I had already chosen my research topic! However, Dr XXX said the topics had already been widely-researched. So I asked him, 'What else I could do?' (Sigh). (Wina, a female information technology application student)*

Students indicated that the identification of topic of inquiry was not an easy task for them to perform. For example, Wina said that the process was a frustration to her due to the time and energy that she had spent in searching, reading, analyzing, and synthesizing information from various sources to come up with proposed topic of inquiry. However, when she was given another topic to study by her teacher, she needed to repeat the process in order to understand the topic and proceed with her research proposal.

In this sense, the tasks of students developing information framework was not limited to students identifying their topic of inquiry, but also includes students identifying the landscape of the topic, i.e., what is already known and what else needs to be done on the topic. More importantly, Wina's experience revealed that the activity of developing an information framework would determine student engagement in the subsequent steps of learning with information. On this point, another postgraduate student (Nori) reported that, although she and her classmates had been introduced to information sources that were potentially useful in developing their research proposal during their information skills programme, some of her classmates did not yet access these sources because they had not identified or specified their topic of inquiry yet. On the contrary, Nori accessed the sources immediately after the programme because she already had a research topic and wanted to know the landscape in which the topic was located.

Respectively, librarians commented on how some postgraduate students *"normally did not know that they did not know"* (Mia) about their topic of inquiry. Accordingly the

students then "*just asked"* librarians" (Azi) about the availability of information sources of the inquiry topic that was unclear and they were not sure of. The librarians said that this situation might be due to the nature of postgraduate students' inquiry which is more specific than that of undergraduate students. The librarians' view was that frequent interactions between postgraduate students and librarians might help the students to be certain about their topic of inquiry before proceed with accessing information from multiple sources. Similarly, postgraduate students (Naim and Nori), who had considerable work experience, agreed that students' interaction with peers, classroom teachers, librarians and experts had helped them to identify and later refine their information framework and topic of inquiry. Although Naim and Nori had identified their research topic while they were still working, long before they joined the university as full-time postgraduate students, they said that multiple interactions with teachers and peers within and outside classroom learning respectively helped them to refine their topic of inquiry.

However, librarians (Azi and Mia) found that librarian–student interactions were sometimes problematic. One librarian's experience was that some postgraduate students underestimated the librarians' "*authority*" and "*qualification*" (Mia) in helping the students to refine their topic of inquiry. Without confidence and trust, Mia felt that it was difficult for her to interrogate and refine the students' information need, which forms the basis for students' accessing information from multiple sources. The researcher also found that issues relating to the identification of topic of inquiry were raised particularly by postgraduate students. In this light, interviews with final year undergraduate students (Feza, Fazil, and Razak) indicated that their research topics were part of a bigger research project run by their teachers who had assigned them aspects of the research topics that they needed to focus on. In this sense, similar to mature postgraduate students (Naim and Nori), final year undergraduate students had identified their topic of inquiry prior to their information skills programs. Although students might begin the first step of student learning with information more or less at the same time, the time that they used to complete the step varied. For example, while Wina was still in the task of identifying her topic of inquiry, other students such as Naim, Nori, Cheng and Razak were already refining theirs. Moreover, the findings suggested that, while it was possible for undergraduate students to participate peripherally in the first

step of student learning with information, it was unlikely for postgraduate students to do so.

6.3 Step 2: Accessing Information

The second step in the activity of student learning with information that emerged from the study is students accessing information about a topic of inquiry from multiple sources of information. A teacher (Sam) associated the step with students' ability to relate their topic of inquiry to existing studies which highlights their inquiry as meaningful. The data showed that the step also comprises several tasks, that is, students articulating information needs, and selecting and retrieving information sources.

Task 1: Articulating information need

During the observation of student information skills programmes, the librarians demonstrated a few strategies for students to articulate their topic of inquiry into searchable keywords. For example, students could use searching tools such as the Library of Congress Subject Heading available in three thick red books, as well as controlled subject headings available in the library online cataloging system. A further examination of the information skills programmes' PowerPoint slide presentations, evaluation form, and student information skills assignment indicated that students' ability to articulate a topic of inquiry into searchable keywords is one of the learning outcomes of the programmes. Although the articulation process depends heavily on student's discipline knowledge, the searching tools introduced by the librarians could help students to narrow down or broaden their inquiry topic, which is useful when students received too few, or too many, search results during their searching activities or when students have very specific or a new research topic to work on.

Although one teacher (Nora) highlighted that she would provide searchable keywords to her students to start their engagement in the second step of accessing information sources, most teachers and students acknowledged that librarians are experts in these areas. Reciprocally, librarians were concerned about students being unable to construct searchable keywords out of their inquiry topic. A librarian (Mia) said that students simply 'dumped' their inquiry topic into databases' search engine, a similar strategy that students employed while searching information on the internet. Since different database providers develop and use different keywords to index their databases, students should

look up and use keywords developed and supplied by the providers to increase the likelihood of retrieving relevant information from the databases.

Both students and librarians were of the view that students' information skills assignments helped students to use the searching tools introduced by librarians. However, those students who did not engage in information skills assignments such as young undergraduate students (Amy, Kay and Kam) and postgraduate students (Naim, Jannah and Maya) did not use the searching tools but instead relied on their internet searching strategies to search for information from online sources.

Task 2: Selecting information sources

During student information skills programmes, I observed that librarians introduced students to various types of information sources such as journal, encyclopedia, thesis and books which were available in various formats such as online, CD-ROM, bounded copies, and microfiches. Likewise, an examination on the programes' evaluation form stated that the main objective of the programmes was to expose students to the library's collection, facilities, and services. According to the librarians, this objective supports the attainment of the library's mission of increasing the number of students who use its resources.

Unlike the librarians who categorize information sources into various types and formats, teachers and students categorized information sources into two simple categories: either 'database', 'online', 'digital', and 'internet' sources, or 'on the shelves' sources. Teachers and students also expected librarians to expose students to sources that covered comprehensive and recent information, and which were fast and easy to retrieve. Moreover, the findings indicated that teachers' preferences for certain types and formats of information sources had influenced their students' selection. For example, by sending her undergraduate students to an information skills programme, a teacher (Ana) expected her undergraduate students to be able to search and use information sources available in CD-ROM databases in their research proposal writing. Ana viewed that the databases provide current and comprehensive information on students' topics of inquiry that is easy and quick to retrieve, and thus made it a better option compared to journals available on the shelves. Similarly, a teacher (Nora) identified online journals as information sources that postgraduate students should use while preparing their classroom assignments and theses. In order to expose students to

the *"latest online databases"* subscribed to by the library, as well as help students to solve technical issues such as *"problems with [students'] passwords"*, Nora sent her students to several information skills programmes in the university library.

Interestingly, students acknowledged that their teachers' preference for certain types and formats of information sources had a major impact on students' selection of information sources. Final year undergraduate students (Cheng, Kan, and Razak) reported that they had chosen to use textbooks in their first year, internet websites in their second year, and online journal articles in their final year of study to fulfill their classroom teachers' requirement. Additionally, final year undergraduate students (Fazil and Feza) accessed and used online journal articles while postgraduate students (Joe, Naim, and Wina) searched and used authoritative books and internet websites following the requirements of their thesis supervisors and classroom teachers respectively.

Accordingly, most students shared a similar preference toward online information sources, particularly internet sources, with their teachers. Second year undergraduate students (Amy, Kay and Kam) used personal blogs as sources of information for completing their classroom assignments because these sources provided them with information that was easy and quick to access. In this respect, although undergraduate and postgraduate students were familiar with internet applications, they said the information skills programme had helped to expose them to a wide range of scholarly online databases were subscribed to by the library or freely available in the internet which offer recent, research-based, and full text resources that were useful for their research proposals, classroom assignments, thesis and project papers.

However, some postgraduate students selected conventional over online information sources to fulfill their information requirements. A PhD student (Rusli), who was a university teacher, selected books as his primary information sources due to the nature of his knowledge discipline and topic of inquiry which depended heavily on books and other printed materials. On the other hand, masters students (Jannah and Maya) selected books over internet websites because they did not like to spend their time in front of computers to search and download online information sources. Interestingly, other masters students (Wina and Naim) also identified practitioners and experts in their

knowledge discipline as sources of information for their classroom assignments and thesis or project paper.

Mature postgraduate students (Naim and Nori) assumed that there is a relationship between types of information sources and students' mastery of discipline knowledge. Nori and Naim observed that fresh postgraduate students generally select and use secondary information sources such as blogs in the Malay language and books that are translated into the Malay language to construct and justify their understanding. On the contrary, Nori and Naim believed that primary sources were the best sources for such activities because original works written by scholars and experts help students to understand original issues, principles or underlying assumptions, arguments, and contexts of the knowledge presented by the authors, which are often missing or misinterpreted in the secondary sources. Naim said that he had no problems reading and accessing the primary sources because of his mastery of the Arabic language, the language in which the sources were published. Moreover, he had already been in possession of these sources from his undergraduate years in a Middle Eastern country. Unlike fresh postgraduate students who access blogs in the internet, Naim reported that he used the internet mostly to access organizational websites that features latest works by authoritative bodies or experts in his knowledge discipline. Naim also often used email to get clarification about their works or ideas that would help him to construct and/or justify his understanding for his classroom assignments and discussions.

Task 3: Retrieving sources of information

Data from the programme observations indicated that librarians taught students to retrieve information from multiple sources using the library cataloging system and online databases subscribed to by the library and those available freely on the internet. Teachers, librarians and students believed that students must be able to engage with the databases' search engines in order to retrieve the required information. However, teachers and librarians perceived that some students did not have sufficient skills for interaction with the databases' search engines. A teacher (Ana) said the interaction requires student to use specific procedures or commands or menus that could assist them to retrieve relevant information. For example, during the interaction, Ana said that students may need to narrow down their keywords to reduce the number of search result into a manageable size:

> *But how do students get information? How do they enter their keywords [into search engines or databases]? Then, when the search results are obtained, how do they select the results that they would want to print...So, let's say we retrieved 500 abstracts; if you think that is too much, you would use other related keywords to cut down the [number of] abstracts to maybe 100. (Ana, a female academic writing teacher)*

As a solution to this conundrum, librarians introduce students to Boolean operators such as OR, AND, and NOT during information skills programmes. As illustrated in the excerpt below, one librarian (Mia) introduced students to Google Scholar as an example of a retrieving system that uses Boolean operators. According to Mia, it was easier for her to use Google Scholar as an example because students were familiar with the features of Google and/or Google Scholar. Additionally Mia thought that Google Scholar is capable of acting as a sort of federated search engine that could help students retrieve information from all databases subscribed to by the library, as well as those that were accessible freely on the internet.

> *Normally, students know how to use the search option on the Internet, but not for online databases. Normally, students just dump all the keywords in one search; they use the Google search approach ... In fact, when I taught the student information skills programs, I introduced Google Scholar to students ... Google Scholar has an academic interface. For example, if students searched Google Scholar, the search would go to the Science Direct database and access full texts available in the database...I taught the students this... Students like Google ... If you used Springerlink [database]; it has a boring search interface. Emerald [database] is not too bad, but ProQuest [database] also has a boring search interface in comparison to Google Scholar ... If students search Google Scholar, they could access full texts available in the databases subscribed by the library. (Mia, a female librarian)*

In general, librarians saw that students' lack of skills in retrieving relevant information was due to their lack of consultation with librarians; this was rebuffed by both teachers and students. With the introduction of the library online collection and tools that enable students to access information and its sources from anywhere at any time, teachers and students expected that they could access necessary training that enable them to retrieve relevant information from library-subscribed databases, whenever and wherever they need it. For example PhD student (Rusli) argued that the library should come out with some sort of on-demand information skills programmes that could expose students to the physical locations of the conventional library collection such as books and reports, which are needed by postgraduate students, such as him, who had previously studied in another university. Although the library already ran orientation programmes for new students at the beginning of new semester, not all students are able to attend these. The

on-demand programmes enable students to obtain basic information about the library collection and layout without the need to consult librarians, who (according to Rusli), like other human beings, were subject to various types of moods, styles and preferences, which might reduce students' motivation to use the library and its collection.

Similarly, one teacher (Nora) thought that on-demand information skills programmes that are available in online or electronic forms could support self-directed learning processes in higher education. These might be able to assist PhD students like Rusli who claimed that he was not receiving sufficient assistance from librarians, or masters students like Wina who "*thought*" that they knew "*everything*" about the library. Furthermore, in considering librarians' observation that some postgraduate students do not yet trust their expertise and authority in helping student learning activities, such programmes could actually become a bridge between the students and the library collection.

I also found that the on-demand concept of accessing and using information was not limited to training material. Teachers and students applied the concept into borderless accessibility and usability of library collection and service. A final year undergraduate student (Cheng) confessed that he only discovered the search features available in the library online cataloging system once he joined the programme:

> *The program helps me to search the library cataloguing system available in the library website. The system is too complicated ... Especially if we want to find the specific location of some books. We didn't know that the web had such a function; we only learnt it after we attended the information skills program. (Cheng, a male academic writing student)*

The concept of accessibility might not be equated with usability. Cheng's comment was supported by a librarian (Lela) who said that the library might need to improve the design of its website in order to increase its optimal usability among their users. In this light, a teacher (Nora) believed that information skills programmes should help students to create a user account that enables them to access the library databases outside the library and university areas. On the same note, a first-year master student (Joe) mostly used the Springerlink database for his classroom assignments because it was the only database in his knowledge discipline that is accessible from his home. On the other hand, a first year master student (Nori) said she needs to come to the university to access and use the library databases while a final year master student (Wina) said the

inaccessibility of the library databases outside the university area is a major factor for students in not using the databases.

Interestingly, librarian (Mia) highlighted that an on-demand concept of students retrieving information and its sources may be incompatible with the library's mission to increase the number of students who visit the library to use its collection and facilities, as well as to consult the librarians. She felt that the library should develop a better measurement for assessing the usability of the library collection and facilities in order to gauge the real value of the library servicing the university community. Corroborating Mia's view, a lot of students, such as final year undergraduate students (Cheng and Razak) and postgraduate students with working experience (Nori and Naim), reported that they shared information and its sources with their classmates. As observed by a librarian (Lea) in the excerpt below, students in the university are no longer visiting the library to access the library collection because they could now simply get information from the internet or peers:

> *Yes, I was surprised when the student confessed that he had never been to the library…He said that sometimes he really did not have the time to come [to the library]. So I asked him how he could survive in his studies without ever coming to the library. He said that it was possible to survive…He said that he finds information sources using the Internet or through friends; he shared the information sources with his friends. (Lea, a female librarian)*

Lastly, teachers (Nora and Wani) believed that, by engaging students in the activity of accessing multiple information sources from the library online databases, they deterred students from copying other peoples' works. However, in order to deter students from engaging in plagiarism, Wani perceived that teachers should monitor students' artefacts and participation during activities of learning with information. Wani reported how she had formatively monitored her students' artefacts and participation in the activities:

> *When I asked my previous students about why they developed their literature [review] using a particular way, they said that their seniors did it in that particular way. The students simply copied their seniors' work…Ha! They directly copied the works. So [now] if my students used literature earlier than five years ago, I tell them to search for recent [information sources]…So, I told them that I wanted recent information sources. There was definitely an improvement in this area! (Wani, a female academic writing teacher)*

Similarly, the findings indicated that without the monitoring process, students engaged in plagiarism without realizing that they had committed the act. For example, although second year undergraduate students (Amy, Kay, and Kam) were exposed to strategies of

accessing information from multiple sources during their information skills programme, they preferred to use personal blogs as the main sources for their classroom assignments. Moreover, they copied pieces of writing from the blogs and used them as their own in their classroom assignments because they thought that the bloggers' writing style is "*neat*". However, unlike Wani, some teachers (Ana, Nora and Sam) assumed that after joining an information skills programme, students would retrieve journal articles and use information in the sources ethically in their classroom assignments.

6.4 Step 3: Interacting with Sources of Information

The step concerning students interacting with multiple sources of information emerged during my interviews with teachers and students. A teacher (Ana) indicated that, after students successfully retrieved information sources such as journal articles from a particular database, they must interact with the sources via browsing, evaluating, selecting and collecting the sources. However, the interaction sequence might vary according to individual students' style and preference. For example an undergraduate student (Fazil) and a postgraduate student (Joe) browsed information sources that they had retrieved and then evaluated whether the sources suited their information needs, and accordingly they rejected or collected the sources via printing, saving, or borrowing. A librarian (Sal) and a teacher (Onn) added that student evaluation of information sources requires students to evaluate types, authority, and recentness of sources before they collected them:

> *What we mean is that students are able to evaluate information sources; whether it is better for students to search for [information from] books or journals. If students get information from Internet sources, is the information authorized, valid or not valid? Students must be able to evaluate whether the information they use is correct. For example, do students require information dating from the 1970s or [should they use] recent information? ... Does the information suit their needs? Is the information relevant? How do they know which journal to use? (Sal, a female librarian)*

> *Let's say you are searching for information sources; when do you stop your search? So the best [way to do it] is for you to start with the latest information sources. Let's say 2008 first, then followed by 2007. Ha! I always tell my students that the accessibility of information sources usually spans the last five years. If they are more than five years old, they are outdated. But in some cases, such as historical studies, the more outdated [the information sources], the better. (Onn, a male academic writing teacher)*

While the process of information-source evaluation focused on the technical aspects of the sources such as their authorship, and publication type and year, a teacher (Onn)

added that the selection process was subjective in nature because it requires students to independently apply their wisdom in selecting relevant information that is useful to fulfill the skeleton of their information need as he illustrated in the excerpt below:

> *Sometimes, students access too much information. So how do they select [information]? ... The selection is done by them. This is what I call wisdom...Even librarians are unable to select information for students. This is what we call wisdom. (Onn, a male academic writing teacher)*

Similarly, students emphasized that their selection process was based on their assumptions of the usability of information contained in the sources in fulfilling their information needs. Undergraduate and postgraduate students (Fazil and Joe) highlighted that after collecting information sources, only then do they select information sources to be used in their research proposal:

> *In my case, I didn't read all [parts of the information sources]. I read the part; what the authors are saying. If I don't see any relation [to what I am doing], I put them aside. I read other articles...I read their introduction and discussion. But first, I will scrutinize what a particular article is saying [abstract]. Next, I focus on its introduction and discussion. If I don't see any relation [to my research topics], I put them aside. (Fazil, a male final year academic writing student)*

> *I search for information sources relevant to my topic using Google or Springerlink [database] or the library online cataloguing system. I collect all the information sources and then select the most relevant information sources...If we use literature which is not related to our topics, I don't think it is good. (Joe, a male first year information technology application student)*

Teacher (Nora), undergraduate students (Fazil, Feza, Hani and Liana) and postgraduate students (Joe and Wina) pointed out further that students recorded and organized the information and its sources that they had selected. Following their supervisor's advice, Fazil and Feza used a computerized programme (Endnote) that could help them to record and organize information about sources that they had selected. Accordingly they joined voluntarily an additional information skills programme in the library to learn more about Endnote. On the other hand, some postgraduate students said they knew about the programme from the librarian who had facilitated their first information skills programme and later joined voluntarily another round of information skills programmes. However, other postgraduate students (Jannah, Naim, and Rosli) reported that they recorded, organized and cited information about sources of information that they used in the classroom assignments using a standard word processor program. They also informed me that they were unaware of any other computerized program that could facilitate the tasks.

6.5 Step 4: Using Information to Construct Understanding

During my interviews with participants, they highlighted that the fourth step in the activity of student learning with information is students using information from multiple sources to construct personal understanding. Teachers (Ana and Onn) believed that, in this activity students should "*digest*" (Ana) or "*process*" (Nora) information that they had selected to form and inform their own "*ideas*" or "*conclusions*" (Onn) or understanding. As illustrated below, Onn explained this activity involves students reading multiple sources, and analyzing and extracting information from these and later synthesizing the information that they had extracted to establish their own ideas:

> *This assignment helps students to present ideas that they derived from their reading. Besides that, I think this assignment can be considered as an applied assignment... So after that, they must integrate [information] and present their own views to establish a conclusion. So if we check over here [students' assignments], the most important factor is that they must have their own conclusion...Yes, their own conclusion, what they have concluded from their reading... [This is] their synthesis, their ideas. [Onn, a male academic writing teacher]*

Similarly, while another teacher (Sam) stressed that reading information from multiple sources, such as books, magazines, and internet is essential to students' construction of personal understanding, another teacher (Ana) corroborated with Onn on the idea that reading is only one of the tasks in using information. Ana added further that a reading task should be purposeful in nature in which students need to identify what they need to accomplish by the reading before they start the task:

> *You have to choose [information], to digest [information]. This means you have to read, you have to rewrite in your own words ... Not just translating [the information]; most students just translate. Yes, if they translate and later 'cut and paste', their sentences are not coherent. (Ana, a female academic writing teacher)*

However, young students might not share Ana's view on student use of information. For example, second year undergraduate students (Amy, Kay, and Kam) preferred to access information from personal blogs on the internet. Furthermore, these students engaged in plagiarism in order to attain good grades; they copied information from the blogs into their research methodology assignments because they thought the bloggers had excellent writing skills. On the contrary, final year undergraduate students (Feza, Fazil and Razak) and postgraduate students (Jannah, Joe, Nori, Naim, and Wina) said that there are no shortcuts in transforming information into meaningful understanding. These students perceived that the step of using information to construct activity is time- and

energy-consuming. For example a postgraduate student (Wina), associated the difficulty of engaging in the activity with having to read "*hundreds of journal articles*". On the other hand, as shown in the excerpt below, final year undergraduate students (Feza and Fazi) associated the difficulty of using information from multiple sources with the tasks of selecting, extracting, integrating, and synthesizing information that formed competing or contradicting views into a coherent, systematic, and meaningful conclusions, ideas or knowledge claims:

> *Fazil: The literature review was the most difficult part of the research proposal…We need to extract [information] from journal articles. Then, we needed to produce coherent ideas, which was the difficult part.*
> *Aidah: What do you mean by extracting?*
> *Fazil: Finding out how to integrate the journal articles into our literature review chapter.*
> *Feza: Selecting relevant points…And how we were to produce coherent ideas, because different authors may say similar things. So we need to write both points, and then relate the different authors' points of view. That part was quite difficult.*
> *Aidah: Why did you find developing coherent ideas difficult?*
> *Fazil: Hmm…it's like; we wanted to arrange things inside our room. We have too many things, but our room is small. It is similar to our thesis writing; we have limited pages [for literature review], while our sources are plentiful. We want to integrate all the information into an interesting arrangement. This analogy shows how difficult it is.*
> *(Fazil and Feza, respectively a male and female final year undergraduate students)*

On the other hand, a few postgraduate students (Joe, Naim, Nori and Wina) reported that, although the activity consumed their time and energy, they managed to complete the activity independently from their classroom teachers. Moreover, as shown below, a postgraduate student (Wina) seemed to enjoy analysing and integrating the various competing views that she encountered while reading the literature and talking to practitioners:

> *I like it when different authors have different views because [then] we can see our own view. Based on the authors' views, I will see where my view is. I think it is easier for me…Usually; I develop my view after I read and see other people's views. We read first and see the relation between previous and current views. But we need to read [the literature] first…Another thing is, I like to ask people [practitioners]. I interview them on how they find the approach to be; is the approach easy or difficult to implement, and what do they think about it. (Wina, a female and young postgraduate student)*

Students' previous experience of engaging in similar tasks may explain their different reactions towards the activity of using information from multiple sources to develop their knowledge claims. For example, postgraduate students said that they had experienced and performed a similar activity in their master classes (Wina and Joe), and

working institutions (Nori). The postgraduate students reported that they have no problems in completing the activity independently from their classroom teachers. Finally, a final-year undergraduate student (Kan) reported that she had only learnt about the activity in her academic writing classes during her final year, the same year that she began writing her thesis project. Due to her lack of experience, Kan said that it was difficult for her to learn about the tasks and practise them at the same time.

Librarians associated students' use of information with classroom learning and knowledge discipline, and view this process as a social event between classroom teachers and students. However, teachers assumed that the process is a personal event, and thus expected students to engage in the process independently from teachers and classroom learning, and thus did not engage students in any activities that could expose students to the process of analyzing and synthesizing information into their own understanding or conclusion. In this regard, my data analysis indicated that most undergraduate students engaged in the process collaboratively within their small study group while most postgraduate students undertook the process on their own.

6.6 Step 5: Articulating the Understanding and the Construction of the Understanding

Interviews with teachers and students revealed that the activity of student learning goes beyond students constructing understanding. As identified in the data analysis, students were required next to articulate their understanding and the construction of the understanding via appropriate and various forms of mediating artifacts that would showcase the process to others. Teachers in the study included a combination of mediating artifacts as part of their classroom assessment which consisted of forms of written (e.g., literature review; reports for thesis or project paper, term papers, research proposal; and examination answer scripts), verbal (student presentation and participation during classroom learning, and student-teacher interactions outside classroom learning), and visual (e.g., PowerPoint slide presentations which support students' verbal presentation). At one extreme, a teacher (Onn) even added student seating arrangement during their lectures and tutorials as a form of mediating artifact that showcase students' readiness to articulate their understanding. Specifically, Onn believed that students who sit in front of the classes had constructed their understanding prior to the classes, and thus were ready to articulate it during classroom learning in relation to students who sit at the back. A mature postgraduate student (Nori) also

associated the 'backbenches' in her classes with fresh postgraduate students who are often unwilling to articulate and share their understanding during classroom discussions.

Although teachers expected that research students (final year undergraduate and postgraduate students) have the ability to access information from multiple sources, in reality teachers acknowledged that some students were unable to perform the activity on their own (Ana, Nora, Onn). In this sense students' participation in information skills programmes and completion of their information skills assignment (if applicable) served as mediating artifacts that articulated students' ability to perform the activity independently from classroom teachers. Moreover, teachers, librarians and students perceived the mediating artifacts symbolized students' competency in university learning (Cheng, Mia, Onn, Razak and Wani), postgraduate learning (Nora and Nori), lifelong learning (Azi, Lea, Nora and Onn), and scholarly activities (Onn and Sam). The mediating artifacts also signified students' active participation in certain communities such as the communities of expert (Naim), knowledge discipline (Ana, Naim, Onn and Sam), local (Jannah) and workplace (Nori, Onn, Sam and Wani).

However, teachers admitted that the articulation process is quite complex as students needed to apply "*higher order thinking skills*" (Nora) and certain "*scholarly*" (Onn) style of writing and presenting their understanding and the construction of the understanding as well as the aesthetic values of the mediating artifacts (Wani). For example Wani explained that students must consider various factors while preparing a visual presentation for their research proposal presentation or defence, such as the font size, number of the slides and the duration of the presentation. In this light, final year undergraduate students (Razak, Feza and Fazil) and a fresh postgraduate student (Wina) stated that the literature review is the most difficult mediating artifact for them to develop. A teacher (Sam) shared the students' view by saying that a literature review requires students not only to read, analyze and synthesize previous studies but communicate the synthesis into certain forms or written structures such as research problems, objectives and methods:

> *Literature review helps students to develop the research problem and method. When students read a lot of literature, they may come to see that their existing research method is not suitable. That is why I think insufficient literature review may lead to insufficient research methods in order to achieve the research objectives. That is why I think the literature review is an important component in research. (Sam, a male research methodology teacher)*

On top of that, teachers added that students were also expected to use certain writing styles while preparing their citations and references (Ana and Wani), and tables and figures (Ana) for mediating artifacts in the written forms such as literature reviews. Such writing styles must be accepted or approved by the university and/or students' knowledge discipline as illustrated by Onn and Wani respectively below:

> *Through our assignments, we wanted to help students to write extended abstracts, journal articles that follow certain formats of publication, if they are to publish their works. (Wani, a female academic writing teacher)*

> *I gave a journal article writing assignment to my students because the assignment helps students to develop their understanding of the thesis and also the format of journal article writing. (Onn, a male academic writing teacher)*

A teacher (Wani) acknowledged further that, although the university had already produced a manual to help students to develop certain style of academic writing and referencing that students are required to use while preparing their mediating artifacts, she believed that student–teacher interaction during classroom learning is still the best platform for students to learn about and apply the academic writing and referencing styles. Likewise, postgraduate students (Jannah and Maya) and final undergraduate students (Fazil and Feza) highlighted that requirements and the feedback that they received from their classroom teachers and thesis supervisor about appropriate writing and referencing style helped them to apply the styles in their classroom assignments and thesis. Fazil and Feza added that they used Endnote to help them to come up with a consistent referencing style in their research proposal writing. Respectively, the data suggested further that teachers, librarians, and students associated the citation and referencing style with technical tasks in student learning with information. None of the teachers, librarians and students highlighted the relationship between these tasks and ethical dimensions of using information from multiple sources to construct and articulate understanding and the construction of that understanding.

Although an examination on the evaluation form of information skills programmes indicated that the programmes aimed to assist students to develop a literature review, a form of mediating artifacts, interviews with teachers and librarians indicated that this was not the case. Librarians generally explained that by engaging students in the activity of accessing information from multiple sources, they hoped students were better equipped to develop and later articulate their understanding into literature reviews. In

this light, librarians viewed that the step of students articulating their understanding and the construction of the understanding are dependent on students' topics of learning and on the norms or standards within certain knowledge disciplines, and thus should be facilitated by classroom teachers. However, librarians provided training for Microsoft Word, and Microsoft PowerPoint and Dreamweaver programs to students as part of student information skills programmes to better equip students to articulate their understanding. However, an exceptional story was told by two final year undergraduate students (Fazil and Feza) who reported that a librarian (Azi) had guided them on the way to construct their own understanding using information from multiple sources and articulate the understanding coherently in literature review. No other students had reported receiving similar assistance. When asked about it, Azi said the students asked for her advice on tips on constructing literature reviews during their Endnote program at the library. Azi added it was easy for her to do so because she simply shared her previous experience in writing her literature review for her own undergraduate thesis.

6.7 Step 6: Reflecting the Understanding and the Construction of the Understanding

Lastly, teachers and students identified the final step in the activity of student learning with information as students reflecting on their understanding, and mediating artifacts of the understanding and its construction with a group of people such as classroom teachers and peers, and experts and practitioners within their knowledge discipline. For example, a teacher (Wani) thought that teachers who supervised undergraduate students' theses in her department (as experts) would not only help students to identify an authentic frontier of knowledge, but also had the ability to assess and reflect the students' understanding and mediating artifacts for the construction of the understanding (poster and research proposal oral presentations). Another teacher (Onn) identified that external and internal examiners for students' thesis are experts who would assess students' understanding, and the process of the construction of the understanding via examining mediating artifacts that had been developed by the students:

> *The student proposed something, but she did not have it [in] her thesis. So her external examiner penalized her [for that]. At the time, I had not yet read the external examiner's report which was 28 pages long! (Onn, a male academic writing teacher)*

Students viewed that student–teacher interaction during classroom lectures, presentations or examinations helped them to reflect their understanding. For example, undergraduate (Cheng, Fazil, Feza, Razak, Liana, and Lily) and young postgraduate (Jannah, Maya) students reflected their personal understanding with classroom teachers just before they submitted and presented the assignments and presentations respectively. Conversely, mature postgraduate students with considerable work experience (Naim and Nori) preferred to reflect their ideas with their study group members who shared similar work experience. Additionally, Naim, and another student, Wina, negotiated their ideas with experts and practitioners in broad and local areas respectively to reflect and validate their understanding that was initially based on their reviews of related literature.

On the other hand, a fresh postgraduate student (Wina) said she chose not to reflect her ideas with her teachers or classmates outside the classroom learning because she was afraid that her teachers and classmates would undermine her and other fresh graduate students' understandings and lack of work experience. Akin to Naim and Nori, Wina negotiated her understanding with a small circle of friends who were her classmates during her undergraduate study but who were currently studying in a different university. Naim and Nori related similar stories; they observed that fresh graduate students in their classes most of the time just listened passively to other students' presentations or reflections during classroom learning.

Teachers and students disclosed further that student reflection of their understanding could be divided into several tasks. A postgraduate student (Jannah) stated that students are required to firstly, present their understanding, and secondly justify the understanding with supporting evidence that could be required by experts spontaneously:

> *Students who have different views from the classroom teacher must be ready with their evidences and rationale ... The teachers will ask us everything; he will spare nothing...Until we don't know what else to say. Sometimes, when we say something, we mean it in a certain way, but he will see it in a different way. At the time we never think about these aspects...When he interrogates us on these aspects, we just went blank. (Jannah, a female research methods student)*

During the reflection process, experts such as teachers, external and internal examiners of students' thesis or peers who are well-informed about the learning topic would not

only listen to students' presentations, but reflect, question or challenge students' understanding, the construction of the understanding and mediating artifacts for the construction of the understanding. Teachers and students identified that some students find it difficult to cope with the experts' questions or challenges. This situation is explained by teachers (Wani and Sam) below:

> *…[Y]ou corner them with questions, even though just basic questions, such as, what do you mean by that and that, the students would say, 'I do not remember, Dr'…But some students can answer the questions; they are okay [with the questions]. (Wani, a female academic writing teacher)*

> *In one of my [postgraduate] students' presentations yesterday, the student claimed that his topic of study or his research problem was the one and only one in this world [sighed]….One and only! However, when we opened the floor for a question and answer session, one of the audiences said that a similar research had already been conducted by another university in Malaysia. (Sam, a male research methods teacher)*

While some teachers (Ana and Wani) associated students' difficulty in undertaking and understanding the reflection process with students' non-compliance of format or styles of mediating artifacts that they were supposed to develop and present, other teachers (Onn, Sam and Wani) further viewed that the difficulty was due to students' inability to justify the basis of their understanding that they had presented. Various reasons were offered by students to explain this observation. These included: students' lack of higher order thinking and communication skills that would enable them to construct, present, and justify their understanding on the spot (Nora and Wani), students had limited access to relevant and recent literature (Sam), students had negative attitudes toward classroom learning such as they were often absent from classes and came to classes without preparation (Ana, Onn), students lacked teacher–student interaction during and outside classroom learning that would help them to reflect on their current understanding, as well as develop an ability to apply information and tips given by teachers during classroom time (Ana and Wani). A teacher (Wani) further believed that students' inability to justify their understanding was due to a lack of mastery of fundamental knowledge in their knowledge discipline as Wani illustrated below:

> *[Some] students have issues with basic knowledge… They are already in their 4th year, so we no longer teach them certain content...They should be able to master certain fundamental contents. But for them, they only learned the fundamental contents for their exams, [so] after they finish their exams, whatever they had learnt just disappears! (Wani, a female academic writing teacher)*

Mature postgraduate students supported Wani's assumption. For example Naim and Nori perceived that most fresh postgraduate students in their classes were unwilling to

reflect their understanding openly during classroom discussion because they did not have a meticulous knowledge of their subject areas. Naim and Nori made such assumptions because they observed that fresh postgraduate students preferred to access and use secondary sources such as translated or reviewed books and personal blogs as their main references. Both of them considered that such sources limit student construction of understanding because the sources were tempered by the translators and other people's views. Moreover students' previous experience in publicly reflecting their understanding helps them to undertake the step with ease and confidence, as was explained by Nori and Naim who undertook the process in their daily work. On the contrary, Nori thought that fresh postgraduate students in her master classes were still in "*shock*" over their current classroom learning practice that heavily emphasized student presentation and reflection of their understanding and thus just "*kept quiet*" in their classes.

The data showed that there were different facets of student reflection of understanding. Some undergraduate students experienced the reflection process as a close- and teacher-centred one, while postgraduate students experienced the process as an open- and student-centred process. For example, undergraduate students (Cheng and Razak) explained that they constructed and reflected their understanding within a small study group and later checked and validated the understanding with classroom teachers outside classroom learning. Based on the teachers' feedback, they then would revise the collective understanding and construction of the understanding as necessary. On the other hand, mature postgraduate students with work experience such as Naim and Nori developed their understanding on their own before reflecting the understanding with a small peer group. As did other mature postgraduate students, Naim and Nori found it was unnecessary to reflect or validate their understanding further with their classroom teachers.

Such differences might be due to the different practices of undergraduate and postgraduate classroom learning. For example postgraduate students (Joe and Nori) reported that their masters degree classes were designed as an open platform for students to present, justify and reflect their understanding and artifacts of understanding with classroom teachers and peers. Joe and Nori explained this experience in the excerpts below:

My teacher helped us to be more communicative, interactive and active…One of the ways [that she did this] was she by giving assignments that required students to make presentations…And she had a question and answer session during our classes…I like this approach because it makes us more independent of the teachers. She gave us deadlines and she gave us assignments. So we seek for knowledge. It is different from a traditional approach where students [just] read books; students only listen [to teachers]. (Joe, a male postgraduate student)

My previous degree [classroom] used a one-way mode [of learning]; we just waited for the lecturers. Now we cannot do that; we have a two-way mode [of learning]. Students have to give [ideas], lecturers also have to give [ideas]; we have discussions. For those with more knowledge, they will communicate more with lecturers. Those with little knowledge like me, only receive a little exposure (laughing). But the classes are more fun because there is a two-way [learning] communication. (Nori, a female postgraduate student)

Similarly, although teachers (Ana, Onn, Sam and Wani) included students' presentation in their undergraduate classroom learning activities, these activities were not regular features of the classroom learning due to the high number of topics that needed to be covered in undergraduate classes (Sam). Although teachers (Onn and Wani) regularly questioned their undergraduate students during lectures, the questions were aimed at validating students' understanding, not to helping students to reflect the basis of their understanding. On the same note, undergraduate students (Cheng, Razak, Farid) commented that they did not have any question during lectures because they were overloaded with information that they could not absorb during that time. Usually they discussed and asked questions about the lectures when they met with their small study group members, sometimes after the lectures took place. During the meetings, undergraduate students compared and shared information and later reflected each other's understanding before reaching a collective understanding and later met their classroom teachers outside classroom learning to validate that understanding.

6.8 Summary

This chapter discussed findings of the study that suggested higher education teachers, librarians and students who engaged in student information skills programmes experienced and perceived student learning of information skills as engaging students in the activity of learning with information. The activity consisted of six steps: students identifying information need, and accessing, interacting and using information from multiple sources to construct, articulate and reflect an understanding and the construction of the understanding. The findings also suggested that the librarians experienced and perceived the student learning as helping students to acquire

information-related skills, while the teachers and students experienced and perceived the student learning as facilitating students constructing understanding using information from numerous sources. Moreover, the findings suggested that the learning activity takes place within classroom context discussed in the following chapter.

CHAPTER SEVEN: IMMEDIATE AND INTERPERSONAL CONTEXTS FOR THE ACTIVITY OF STUDENT LEARNING WITH INFORMATION

7.1 Overview

This chapter aims to answer my second and third research questions, i.e., what is the immediate context for student learning of information skills as experienced and perceived by university teachers, librarians and students who engaged in student information skills programmes, and how do they experience and perceive the interplay of interpersonal factors in student learning of information skills? The classroom context emerged from my data analysis as the immediate context for student learning with information, as opposed to student information skills programmes as originally assumed. The university teachers, librarians and students experienced and perceived the classroom context provides physical, cognitive and psychological spaces that enabled them to attain various goals, use multiple shared resources, and develop multiple interpersonal contexts. My data analysis showed that student–teacher, student–student, student–expert/practitioner, student–librarian, teacher–teacher and teacher–librarian interpersonal contexts influenced students' engagement in the activity of learning with information. This chapter also explains the role of the multiple goals, shared resources and interpersonal contexts in sustaining students' engagement in the learning activity.

7.2 Attaining Multiple Goals

My data analysis showed that the university teachers, librarians and students perceived that the classroom context is the immediate context for student learning of information skills as opposed to student information skills programmes run by the library. They perceived that classroom context provides physical, cognitive and psychological spaces for them to negotiate and attain various goals related to the activity of student learning of information skills. As discussed below, the goals vary from personal, interpersonal to social goals.

Attaining personal goals

My data showed that the classroom context provided physical, cognitive and psychological spaces for the group to experience personal success, satisfaction and enjoyment derived from students' completion of the learning activity of information skills. For example, students engaged in the activity in order to obtain good grades for their classroom assignments (e.g., Amy, Kay, Kam, Cheng, Jannah, Maya and Razak), presentations (e.g., Joe) and examinations (e.g., Razak). Similarly, other students engaged in the activity in order to complete a project paper (e.g., Wina) or thesis (e.g., Farid, Kan and Nori) required for their university graduation.

A few postgraduate students added that they engaged in the activity of information skills learning in order to obtain personal enjoyment and satisfaction during their classroom learning. For example, Nori and Wina felt a sense of satisfaction when their efforts in reading, analyzing and synthesizing information from multiple sources had been acknowledged by their classroom teachers and peers during their classroom presentation. Nori also reported that, although her time was limited, she pushed herself to access, read and use information from authentic books and online databases in order to prevent personal embarrassment during a question-and-answer session of her classroom presentation. In this sense, the classroom context was seen by the postgraduate students as a physical or tangible space that allowed them to experience the pleasure of learning as a result of their engagement in the activity of information skills learning.

Additionally, my analysis showed that classroom learning that engages students in the activity of information skills learning provided the context for the university teachers and librarians to experience personal satisfaction and enhance their personal identity in the university. For example, teachers (Nora, Wani, Onn and Sam) took all the trouble to transform their classroom learning from examination-based courses into interactive and formative-based assessment courses, and to maintain a good relationship with librarians in order to help their students to excel in their university learning and future employment. By doing so, the teachers experienced a sense of personal satisfaction, enjoyment, and recognition when their students successfully graduated from the university and gained employment. Likewise, librarians spent a lot of time during and after office hours promoting and conducting student information skills programmes across classroom learning, and later grading student information skills assignments

because they felt a sense of pride in helping the university to transform the students into independent and lifelong learners.

Attaining multiple interpersonal goals

The university teachers and students also used the classroom context as the space to attain various interpersonal goals that had been developed or negotiated within certain ethnic, age, and gender groups. For example, the university teachers, librarians and students considered that the classroom context enabled Chinese students to excel in their study due to the perceived characteristics of Chinese students who were very academic goal-orientated and committed and preferred to work collaboratively with each other (Wani dan Razak), and demonstrated good verbal communication skills (Onn). They viewed such characteristics had enabled Chinese students to excel in the classroom context because classroom learning required students' intensive and collaborative efforts in accessing and using information from multiple sources to construct, communicate and reflect understanding.

On the contrary, Malay students were generally engaged more in their college activities and less on the activity of student learning with information (Wani and Razak), preferred to work on their own (Wani and Razak) and demonstrated a weak or medium level of verbal communication skills (Onn and Wani). Specifically, Onn experienced that his Malay students preferred to use non-verbal communication, i.e., body language, in comparison to verbal communication within and outside classroom learning. As observed by a teacher (Wani) and a few Malay students (Razak, Feza and Fazil), such characteristics had led to low- or non-performance among some of Malay students within their classroom learning. However, Malay students might have had competing goals that they wanted to attain during their university study. For example, most undergraduate Malay students involved in my study stayed within the university colleges while Chinese undergraduate students stayed outside the campus. Although the colleges provide easy access to university facilities, these students were required by the colleges to participate actively in various co-curriculum activities organized by the colleges. One teacher (Wani) said that some of the co-curriculum activities required her students to stay up late and miss her classes.

Despite the stereotyping categorization of Chinese and Malay students, I could see that some of Malay undergraduate student participants (i.e., Fazil, Feza and Razak) and all Malay postgraduate student participants did not fit into this categorization. Since I had only two Chinese and one Indian student participants; I was unable to search for non-Malay students who did not fit the categorization. Additionally, in the context of the university that is dominated by Malay students, where Chinese and Indian students only constitute a small percentage of student enrolments, I personally viewed that such categorization is not exclusively for Chinese students. The categorization is also applicable to any minority groups working within majority groups—such as Malay students studying abroad.

Similarly, the classroom context provides a space for the young university students to access and use online information sources to construct an understanding in comparison to mature students who are more familiar with traditional sources of information. A mature postgraduate student, Nori, believed that such a pattern exists because young students have been using the information and communication technology from an early age, while mature students like her had just been exposed to the intensive use of the technology while at the university. However Nori observed that, while the young university students were good at accessing information from online sources, they lacked an ability to construct a deeper and comprehensive understanding on their topic of learning because they were unwilling or unable to examine the validity of the assumptions and sources used in the online sources. By doing so, they actually missed the opportunity to develop their understanding, and more likely would engage in 'plagiarism' activity. The differences between young and mature postgraduate students were also applicable to young and mature students in undergraduate programmes. For example, Nori's observation was consistent with the data that showed second year undergraduate students (Amy, Kam and Kay) copied information from personal blogs into their classroom assignments, while final year undergraduate students (Fazil, Feza, and Razak) accessed, analysed and synthesized information from multiple sources to develop their understanding in their topic of inquiry.

Attaining multiple social goals
Using the classroom learning as the context, the university teachers, librarians and students engaged in the activity of student learning with information to reach various

social goals. For example, in a knowledge discipline context, teachers used the classroom context to train students to become full members of knowledge communities (Ana and Wani) and scholars (Onn and Sam) through engaging students in the activity of student learning with information. In the national context, the university teachers also purposely designed the activity to ensure students from multiple ethnicities (Onn) and gender (Sam) to work together in the classroom learning in order to promote harmonious inter-racial relationships in Malaysia (Onn) and facilitate the development of graduate attributes required by the national education (Wani) and economic (Onn, Sam and Wani) framework.

In the local and workplace contexts, the university postgraduate students used the classroom context to use information that they had accessed in order to collaboratively construct and reflect their understanding about current issues faced by their local (Jannah) and workplace (Nori) communities. These mature postgraduate students reported that the classroom context had provided them with a platform to share experiences and information related to external issues, and articulate and reflect their personal understandings using different perspectives which ultimately transformed their existing understanding into something new and more comprehensive. Likewise, in the university context, both the university teachers and librarians incorporated the activity to support the current university practice that emphasized outcome-based learning or student-centred learning. For example, a teacher (Onn) encouraged students to articulate and reflect their understanding during classroom learning following the student-centred learning approach currently employed by his university. Likewise, the university librarians facilitated student access and retrieval of multiple types of information sources owned and subscribed to by the university to support the student-centred learning advocated by the university. In the same way, the university teachers and librarians used the classroom context to engage students in information skills programmes which were identified as among the university's flagship project for lifelong learning and research activities.

At the academic programme level, via employing the activity of student learning with information, a university teacher (Nora) used classroom learning as a context for her postgraduate students to acquire information-related skills such as accessing, analyzing and synthesizing information from multiple sources because Nora believed such skills

were basic for students to undertake their postgraduate study. Similarly, via engaging students in the activity of accessing and using information from relevant and recent sources (Ana, Onn, Sam and Wani), the university teachers used the classroom context to expose their undergraduate and master students to the systematic and social process of conducting, reporting and defending their thesis, a requirement for the university students' graduation.

7.3 Using Multiple Shared Resources

Teachers believed that classroom learning is the main context area that students could "learn from" and interact with; it is the most important source that for facilitating student engagement in the activity of learning with information, i.e., the teachers. Academic writing teachers (Ana, Onn and Wani) stated that there are no complete textbooks that could help undergraduate students to acquire and master academic research and writing processes. However, with their knowledge and experience, teachers could provide guidelines for students to undertake the systematic process of academic research and writing. Respectively, Wani believed that, unlike text books that students could read on their own, teachers are interactive sources that help students "*to learn*" as teachers share their knowledge and experience with students and interact with students them to engage them in the learning.

Likewise, Onn also highlighted that the interactive nature of his classroom learning had enabled him to assess student engagement with the topic of learning and activity of student learning with information. Based on his quick assessment, Onn would tailor his lectures to suit the current level of student engagement before proceeding to the next learning topic. On the other hand, Sam, a research method teacher, provided his students with basic guidelines for conducting systematic and ethical research, which serve as starting points for students to learn independently outside their classroom learning. Due to the multi-faceted roles of teachers in engaging students in the activity of student learning with information, teachers (Onn, Sam and Wan) highlighted that it was imperative for students to attend their classes. To discourage students from missing lectures, tutorials and information skills programme sessions, teachers monitored student attendance sheets closely, conducted pop-quizzes during lectures and tutorials, and barred students from taking final examination if their classroom attendance was less than 70 percent.

Librarians also viewed saw teachers as the most important source to engage students in the activity of student learning with information. One librarian (Mia) considered such situation exist be because students generally lack the inner motivation and skills of autonomous and independent learners. As an example, instead of joining information skills programmes voluntarily and independently from classroom teachers, students wait for their teachers to integrate the programmes in their classroom learning. Accordingly, librarians perceived that, if left to their own devices, they would not come to the library voluntarily. As a librarian (Lea) observed below:

> *Instead of tackling students who come to the library on their own accord, we can see a faster result of students searching and accessing the library collection and services when the instruction is given by teachers…Some students just never comes to the library. I know one student who never comes to our library! (Lea, a librarian)*

Due to this perception, librarians (Azi and Sal) were concerned that, for a quite some time most of the library information skills programmes have been are requested by the same classroom teachers. Whenever these teachers leave the university, either for their sabbatical leave, further study, or retirement, there is no guarantee that the teachers who take over their classes would continue the tradition of incorporating information skills programmes linked to the classroom learning. As a result, to ensure all university students are well-trained in searching and retrieving information from multiple sources, librarians were in the process of lobbying faculties and departments within the university to integrate information skills programmes across all classes within the faculties and departments.

An undergraduate student (Razak) supported the view of the librarians, commenting that his classroom learning sets a "rhythm" of sorts for him to go to the library and use its various facilities and collections. As Razak illustrated below, his participation in an information skills programme was facilitated by the fact that the programme was an integral part of his classroom learning:

> *I think it is better to have student information skills programmes integrated in our classroom learning…Sometimes we want to go to the library, but at the end, we don't…Sometimes we don't pay much attention if we do it on our own. When it is integrated into a class, the programme becomes compulsory. When it is compulsory, we are already tied to the programme, so we just have to follow it. If we have to go to the library on our own, we will probably go only once or twice and then we don't want to go anymore. If it is integrated into our classes, we*

need to do the information skills assignment. We would not do it if we go to the library on our own. (Razak, a final year undergraduate student)

Although students acknowledged the importance of teachers in facilitating their engagement in the activity of learning with information, they also cited other sources that they often used during the engagement. For example, due to limited time, information and student-–teacher interaction during classroom learning, final year undergraduate students (Cheng and Razak) found that teachers alone were insufficient to help them to construct an understanding of their topic of learning and mediating artifacts of that construction of understanding. Accordingly, like other undergraduate students, Cheng and Razak often interact with members of their study groups which consist of a few selected peers from their classroom learning. They often share information and its sources such as websites, online journal articles, and past-year examination questions with each other in order to complete their classroom activities and assignments. Additionally, postgraduate students (Naim and Wina) cited that in addition to classroom teachers, sources that they often use during the activity of learning with information were members of their study group who shared similar work or previous learning background as well as experts and practitioners that they had contacted via email and face-to-face meetings respectively.

7.4 Developing Multiple Interpersonal Contexts

My data analysis showed that the classroom context was the main context for the university teachers and students to interact with each other. As discussed below, classroom learning is the main context for the development of student–teacher, student–student, student–expert/practitioner, student–librarian, teacher–teacher and teacher–librarian interpersonal contexts which are essential for the activity of student learning with information.

Student–teacher interpersonal context

The university teachers thought that the classroom context was the immediate context for student–teacher interaction. In particular, the activity of student learning with information required the university students to articulate and reflect an understanding (and the construction of the understanding) collaboratively with classroom teachers during or outside the classroom context. In this respect, the style and requirements of the university teachers were vital for initiating and maintaining student–teacher

interaction. For example, postgraduate students (Jannah, Maya, Nori and Wina) said that they had worked hard to construct and articulate their own understanding for their classroom presentation because, from their experience, they knew that their classroom teacher would question every aspect of their understanding including their assumptions and evidence during the presentation. Similarly, a postgraduate student, Jannah, added that she had learnt quickly to apply the required referencing and citation style because her classroom teacher would penalize her work for not doing so. Undergraduate students (Cheng, Kan, and Razak) also reported that they used certain information sources to complete their activity of student learning with information following the requirements of their classroom teachers:

> *During our first year, we seldom use online journal articles because we normally concentrated in our lecture notes. Only during our second year we engaged in assignments that require us to find information sources…Usually during our first year, assignments are related to our lectures, so we can find the information in our text books...In the second year our teachers started to give us assignments outside our text books. We need to find resources. (Cheng, a final year undergraduate student)*

The university teachers also perceived that classroom learning was the context in which students engaged in the social process of articulation and reflection of their understanding and its construction. Accordingly the university teachers required students to communicate and explain their understanding during lectures (Onn and Wani), and they designed classroom presentations that included multiple interaction between student and teacher and student and student to enable students to reflect their knowledge in the light of new information or alternative evidence offered by the classroom members. As explained by a teacher (Sam):

> *In one of my students' presentations yesterday, the student claimed that his topic of study or his research problem was the one and only one in this world [sighed]….One and only! However, when we opened the floor for a question and answer session, one of the audience said that a similar research had already been conducted by another university in Malaysia ... This means that he lacks access to information! (Sam, a research methods teacher)*

Similar experiences were shared by postgraduate university students (Jannah, Maya, Naim and Nori) who highlighted that the classroom is where students shared, explained, and defended understanding that they had constructed prior to the classroom learning as explained by Nori:

> *Students who have extra knowledge would be more exposed to teachers. However, students who have little knowledge, like us, get less exposure. But learning is more fun because it occurs in both directions…Sometimes, two-way*

learning gives us satisfaction. Other times, it gives us pressure when we are unprepared or when we have insufficient knowledge, as we don't know much and yet we are pressed by teachers to answer their questions. In this situation, we feel pressured because we are asked about topics that we don't know about or when have incomplete information. But when asked when we were prepared, it is fun...Whenever people counter our arguments, we can defend our answers. (Nori, a first year postgraduate student)

My data analysis indicated that student–teacher interaction also occurred outside the classroom context. For example, a teacher (Sam) learned about the great benefits of information skills programmes to research students four years ago during an informal conversation with a postgraduate student from a different department in the university. The data analysis also showed that teachers and students employed various strategies within and outside classroom context learning to initiate and maintain positive and supportive interactions between teachers and students. For example, the university teachers and students shared stories, experiences, or tools that could facilitate student completion of activities both during and outside the classroom context. In this respect, teachers (Nora, Onn and Wani) initiated and sustained teacher–student interaction by being open, accessible and respectful to students. For example, in addition to face-to-face meetings, Wani allowed her students to communicate with her via email and mobile phone because she believed that open communication between student and teacher underpinned by mutual respect would increase students' confidence to share and articulate their knowledge and its construction with the university teachers.—Wani viewed this as a necessary step for students who had just been exposed to the activity of student learning with information.

Additionally postgraduate university students (Jannah, Maya, Naim, and Nori) and final undergraduate university students (Cheng, Fazil, Feza, Kan, Razak) valued teachers who made themselves accessible to students during and outside the classroom context because these teachers were willing to give up their time to work collaboratively with students. On the same note, the university teachers expected students to interact with them via: 1) participating or interacting with teachers and peers during and outside the classroom context (Nora, Onn and Wani); 2) attending lectures and applying the lectures in students' classroom assignments (Ana and Wani); 3) developing and articulating understanding prior to and during classroom time respectively; and 4) demonstrating effective verbal communication skills (Onn), and independent and collaboration learning skills (Nora, Onn and Wani) during their classroom learning.

In the classroom context, the study showed that the element of respect emerged in the study as underpinning the student–teacher interaction. Echoing Wani, another teacher (Onn) said that student–teacher interaction requires teachers to show respect for students by not deliberately embarrassing or ridiculing students' personality or understandings in front of the class (which could damage the students' dignity and potential). True to his word, Onn did not pinpoint 'non-participative' students or take out his disappointment on them during his lectures. Instead, Onn used tutorial classes to pressure them psychologically to participate voluntarily in the classroom discussion. With a small number of students and lots of questions or topics to discuss, Onn slowly invited the non-participative students to share, explain and articulate their ideas with members of the class.

Student–student/peer–peer interpersonal context

Interviews with the university students suggested that the classroom context provides a common interest for students to initiate and continue peer–peer interaction necessary for the completion of the activity of student learning with information. Although peer-to-peer interaction might occur between all classroom peers, my data analysis showed that students interacted informally with a few selective peers outside the classroom context to co-construct their understandings. For example a final year undergraduate student (Razak) confessed that peer-to-peer interaction had helped him to excel in his classroom learning. In his case, due to his time constraints, Razak had identified two classroom peers who were willing and committed enough to share information and co-construct understanding of their classroom topics. Currently, Razak was comfortable working with two female classmates who constituted his regular study group in which they accessed and shared information from multiple sources, co-constructed a collective understanding, and monitored the timeframe for their classroom assignments and examinations. Although the three of them stayed in different colleges, Razak said that was not a problem since they communicated regularly via online messaging (Skype) during the night.

My data analysis also indicated that, in order to complete their classroom assignments, some of the university students interacted with different peer groups. Nori is an example of such a case, a mature postgraduate student who interacted regularly with two

different groups of students: a few mature postgraduate students, and a few fresh postgraduate students. Nori found that her interaction with mature postgraduate students helped her to locate her understanding within the framework of their workplace community as they shared a similar work background. Alternatively, because the fresh postgraduate students were computer-savvy, Nori found her interaction with them could help her to search and retrieve information from online or electronic sources.

In contrast, a young and fresh postgraduate student (Wina) observed that the classroom context had become a battlefield between fresh and mature postgraduate students. She discovered that mature students in her classes simply reject ideas or views from young or fresh postgraduate students. Due to this situation the classroom context was no longer serving as a common interest site for Wina and her mature peers to interact outside the classroom context. Instead she used the classroom to negotiate and justify her ideas with her classroom teachers. Using this strategy, Wina said that she could 'kill two birds with one stone': she got an objective assessment of her ideas from her classroom teacher, as well as gaining self-satisfaction for being able to stand up to the ridicule of her mature classmates.

Wina also provides a good example of how peer–peer interaction does not equate to a peer–peer relationship. For example Wina perceived sometimes she needed to do something that was against her principles in order to maintain a good relationship with her peers. Although Wina was reluctant to share certain information that she had acquired herself with great difficulty with her peers, at the end she shared the information with them because she believed that "*you need to help those people who ask for your favours because you never know in near future you might ask their favour in return.*" However, after the incident Wina felt disappointed because her peers did not mention or acknowledge her help either during or outside the classroom context.

Student–expert/practitioner interpersonal context
The university students admitted that the classroom context provided them with a sense of purpose to initiate an interaction with experts and practitioners within their topic of inquiry during their engagement in the activity of student learning with information. For example, a mature postgraduate student, Naim and a fresh postgraduate student, Wina interacted with experts and practitioners in their knowledge discipline while preparing

for their classroom presentation and independent inquiry respectively. Naim validated his understandings with experts who were well informed of current research and developments in their knowledge discipline via email correspondence. While Naim assumed that his Arabic proficiency is the factor that facilitated his interaction with the experts, his previous learning experience in the Middle East might also assist in the interaction. On the other hand, due to her lack of practical experience within her topic of inquiry, Wina met the practitioners to explore their' perspective before she incorporated their perspective into her own understanding which, originally, was based solely on her literature reviews.

Student–librarian interaction context

The university teachers and librarians considered that the classroom context is key for the development of student–librarian interaction which aimed to facilitate student engagement in the activity of student learning with information, particularly in undertaking the step of accessing information from multiple sources. However, unlike teacher–student interaction, students were slow in initiating student–librarian interaction due to students' insufficient knowledge of, and confidence in the librarians' role and expertise. Librarians (Azi, Mia and Sal) confessed that, without that confidence, it was difficult for the students to initiate the interaction or engage in a productive student–librarian interaction.

Although a few librarians such as Azi and Sal believed that students would ultimately acknowledge librarians' expertise and role in facilitating student engagement in the activity in question, for some students such as a fresh postgraduate student, Wina, such acknowledgement had come too late. Coming from a different university, Wina thought that her experience of using her previous university library system and collection was sufficient to help her to find her way in the current one. Accordingly, she did not feel the need to interact with librarians in her current university library until the day she joined an information skills programme in her final year, which was arranged by one of her classroom teachers (Nora). Wina admitted that she just realized that day that the librarians "*knew everything*" about all types of information sources available and subscribed to by the university library, and the ways to search and retrieve information from the sources. In Wina's case, her ignorance of the librarians' expertise in

facilitating her engagement in the activity of student learning with information had cost her the project paper that she would submit in her final year.

In this light, a librarian (Mia) used a different strategy to increase students' confidence in the librarians' expertise and thus increase student–librarian interaction. Specifically, Mia informed students of her qualifications and expertise during information skills programmes and student consultations at the library helpdesk in order to sustain student–librarian interaction during and after the programmes and consultations. Additionally, before Mia conducted the programmes and consultations, she took some time to learn about the students' previous experience in information searches and their current information need, and used that information to conduct future programmes and consultations.

However, as was evident from my observations, not all librarians took the time to learn about students' needs or integrate the information into the running of the programmes. For example, during one observation, I noticed that for half the programme, most students did their own work such as browsing the internet or checking their email and Facebook instead of focusing on the librarian's lecture and PowerPoint presentation. Second year (Kam and Kay) and final year undergraduate students (Cheng, Razak, Kan) reflected that the librarian in their information skills programmes did not engage them in meaningful student–librarian interaction, instead she focused heavily on her PowerPoint presentation. Due to this lack of interaction, the librarian was unable to maintain students' interest or assess student understanding. For example, some second year undergraduate students reported that they felt bored and "*could not wait for the programme to end*" (Kay) because they were already familiar with what had been explained by the librarians and yet did not have any chance to ask about aspects of information search they were not yet familiarized with. Another final year undergraduate student, Chan, just listened to the librarian's explanations during the programmes and later discussed what he had learned or was not sure about regarding information search and retrieval during meetings of his regular study group which took place some time after the programme.

My observation was supported by a university teacher (Nora) who commented that some librarians were heavily dependent on their PowerPoint presentation during student

information skills programmes. Although the presentation provided useful information about information search and retrieval in the context of the university library collection, Nora thought that the presentation somewhat had restricted the librarians from tailoring the programmes to suit students' unique and diverse information needs. Instead of becoming a dynamic space for students to deepen their knowledge and skills related to information search and retrieval in the context of their knowledge discipline and topic of learning, Nora was concerned that the PowerPoint presentation would turn the programmes into standardized courses unsuitable for actually facilitating student engagement.

Teacher–teacher interaction

At the departmental level, the university teachers (Ana, Onn and Wani) used the classroom context as a platform to facilitate student engagement in the meaningful and authentic activity of student learning with information by working collaboratively with colleagues in their department. Specifically the collaboration efforts enabled students to work with their thesis supervisor in identifying a topic for their independent learning. However, a teacher (Wani) said such collaboration was not without its problems. For example a few teachers refused to work with the students and did not turn up during the students' oral and poster presentations and evaluations. Wani usually gave up her own time to work with the students as well as to attend and evaluate the students' presentations in order to sustain the students' engagement in the activity of student learning with information that was employed in her classroom context.

Teacher–librarian interaction

The classroom context had become the source for the development and maintenance of teacher–librarian interaction, which was the key to the successful student information skills programmes in classroom learning. The study identified various forms of teacher–librarian interaction that sustained the collaborative efforts between them. For example, realizing the great benefit that his Research Methods students could gain from attending information skills programmes, Sam had been working with the university librarians to enrol his undergraduate and postgraduate Research Methods students. Because both classes had over a hundred students, Sam viewed that such enrolment was possible due to the commitment of the university librarians to conduct multiple programmes for his students. Sam wrote a letter of appreciation to the university

librarians and attended a few of his postgraduate student information skills sessions. Sam also hoped that the appreciation letter would become handy during the librarians' yearly work assessment, and become a source for the librarians' continuous support and commitment.

Another university teacher (Onn) highlighted that, in addition to a sense of appreciation, he felt a sense of trust and respect towards the university librarians' ability to design and implement student information skills programmes in a systematic way. Consequently, Onn chose not to monitor the programmes because he worried that the librarians would feel, "*as if they do not know how to do their work*". Similarly, Nora developed and maintained a good relationship with librarians because the relationship would lead to productive student–teacher–librarian interactions that would facilitate students' access to the library system and online information sources. However, unlike Onn, Nora joined her students' information skills session to ensure her students received *"sufficient information"* about information searches that would enable the students to complete their classroom assignments. Accordingly, in addition to information given by the university librarian, Nora provided extra information to her students during the programmes. For example she provided examples of online databases that were suitable for use by the students to complete their classroom assignments.

7.5 Summary

This chapter discussed the findings of the study that suggested the activity of student learning with information was located within the classroom context instead of in the student information skills programme context as originally assumed by the study. The findings indicated that the classroom context was the immediate context for the activity of student learning with information due to features that support the attainment of multiple personal, interpersonal and social goals; usage of multiple shared resources; and development of multiple interpersonal contexts within and beyond the classroom context. The findings also showed that interpersonal contexts such as student–teacher, student–student, student–expert/practitioner, student–librarian, teacher–teacher and teacher–librarian facilitate students' engagement in the activity of student learning with information. However, my findings indicated further that various social contexts located outside the classroom context had also formed and informed the activity of student learning with information, as will be discussed in the following chapter.

CHAPTER EIGHT: SOCIAL CONTEXTS FOR THE ACTIVITY OF STUDENT LEARNING WITH INFORMATION

8.1 Overview

This chapter aims to answer my third research question, i.e., how do university teachers, librarians and students who engaged in student information skills programmes experience and perceive the interplay of social factors in student learning of information skills? My data analysis suggested that the university teachers, librarians, and students experienced and perceived that student learning with information was formed, and informed, by various social contexts located outside the classroom context. The social contexts identified in the data analysis were: the information age; knowledge discipline; academic research; workplace context; local context; the university; the department; the library; and academic programmes. This chapter discussed how each social context had directly or indirectly either formed or informed the features of student learning of information skills. .

8.2 Information Age

My data analysis showed that the expansion of information technology and communication application in the information age had formed and informed certain features of the activity of student learning with information within the university.

The shift to scholarly and electronic and online information sources

Due to the application of the technology in the way certain information could be accessed and retrieved by the university library users; the university teachers expected that the university librarians would expose their students to knowledge and skills related to information search in electronic or online information sources during student information skills programmes. Such an expectation was underpinned by the university teachers' beliefs that any computer-based information sources provided students with comprehensive and recent information which could be quickly and easily retrieved by

students. For example, a university teacher (Ana) had sent her undergraduate students to information skills programmes in the university library because she wanted the students to learn how to search and retrieve relevant, recent and comprehensive information from CD-ROM databases. This expectation was in line with that of other university teachers who expected the programmes to provide students with knowledge and skills (Ana, Nora, Onn and Sam), and confidence (Onn) in accessing and retrieving information from multiple scholarly online databases subscribed by the university or available in the Internet. The data analysis revealed that only one university teacher (Onn) had associated the programmes with students accessing traditional or 'on the shelves' types of information sources (books) while the rest of the university teachers associated the programmes with students' access to electronic and online information sources.

Following the university teachers' preference for the electronic and online information sources, final year undergraduate students (Cheng and Razak) reported that they used printed textbooks only in their first year, and later heavily used internet websites and online journal articles in their second and final years of their study respectively. The trend was supported by second year undergraduate students (Amy, Kay and Kam) who used personal websites and blogs as their main information sources for the activity of learning with information because the sources were quick and easy to access and retrieve. Although final year undergraduate and young postgraduate students were already familiar with various internet applications, the university students confessed that their information skills programmes had exposed them to a wide range of scholarly online databases that the university library subscribed to or which were freely available on the Internet. In comparison to other articles that they had found on the Internet, the scholarly online databases had provided them with the recent, empirical, scientific, and full-text information that was required by their classroom teachers.

Borderlessness and timeliness of information access

My data analysis also indicated that the information age had brought the concept of borderlessness and timeliness of information access to the university teachers and students. For example, a university teacher (Nora) enrolled her students in information skills programmes in order to solve students' "*problems with password*" that enable them to access the university library online databases from outside the university premises at any non-specific time which was also advocated by other university teachers

(Ana and Onn). Similarly, the issues of the borderlessness and timeliness concept of information access were also raised by the university students. For example, a first year postgraduate student (Joe) mostly used articles from the Springerlink database for his classroom assignments because it was the only database related to his knowledge disciplines that was accessible from his home. On the other hand, although a first year postgraduate student (Nori) had successfully solved her library's username- and password-related problems, at the end she still needed to come to the university to access and use the library online databases due to the databases' connection problems outside the university area. On a similar note, a final year master student (Wina) reported that the inaccessibility of the university library databases' was the primary reason why she and other part-time students did not use the databases as much as they should.

Interestingly, a librarian (Mia) highlighted that the borderlessness and timeliness concept of student access to information sources may be incompatible with the library's mission to increase the number of students who visited the library, used the library collection and facilities and consulted the librarians. Consequently, she felt that the library should develop a better measurement for assessing the usability of the library collection and facilities in order to gauge the real value of the library services to the university community.

Literacy in using multiple retrieving systems or search engines
Following the information sources' preference of the university teachers and students, and the availability of the scholarly electronic and online databases in the university library and on the Internet, the university teachers, librarians, and students associated the step of students accessing information from multiple sources with students using or manipulating the retrieving system or search engine of the databases. My data from student information skills programmes also showed a similar feature. For instance, the university librarians exposed students to the retrieving system or search engine of the library cataloging system and multiple electronic and online databases systems available in the library or available freely on the Internet. Moreover, in the light of the information age, a university librarian found it much easier to expose undergraduate and young postgraduate students to the concept of retrieving systems or search engines,

keywords, and Boolean search tools using the Google Scholar browser as the students were already familiar with the features of Google.

Minimizing plagiarism

Similar to the rapid change of research and development in information and communication technology, my data analysis indicated that the university teachers are introducing a similar trend in the area of student learning with information. A university teacher (Nora) sent her students to information skills programmes in the university library because she wanted her students to search and use the "*latest online databases*" subscribed to by the library. Nora added teachers, too, should upgrade their knowledge and skills in searching and using the latest online databases in order to facilitate students' information access and retrieval in these databases which, she said, had cost the university a fortune and could prevent students from engaging in plagiarism. Similar to Nora, anotherteacher, Wani, believed that university teachers could deter students from engaging in plagiarism by requiring students to access and use recent information from online sources in classroom assignments. Such a requirement would force students to search, retrieve, read and integrate the information in their classroom assignments, and thus lessen the chance for students to copy the works of their seniors. However, as Wani commented below, despite the availability of the recent information, a proper monitoring process is a must to minimize plagiarism among students:

> *When I asked my previous students about why they developed their literature [review] using a particular way, they said that their seniors did it in that particular way. The students simply copied their seniors' work…Ha! They directly copied the works. So [now] if my students used literature earlier than five years ago, I tell them to search for recent [information sources]…So, I told them that I wanted recent information sources. There was definitely an improvement in this area! (Wani, a female academic writing teacher)*

Wani's view was corroborated by another university teacher (Ana) who was concerned that some of her students simply translated information that was written in English into their classroom assignments which were prepared in the Malay language. As a result, the students' work became 'patchworks' that lacked coherence and meaning, and thus did not contribute toward the attainment of the goal of the activity of student learning with information. On the other hand, students might not realize that they had breached academic ethics when they copied other peoples' writing and used it in their assignments. For example, second year undergraduate students (Amy, Kay, and Kam) copied writing that they had found in personal blogs and used it as their own in their

classroom assignments because they thought that the bloggers' writing style was '*neat*', and thus could help them to attain good assignment grades.

Using multiple computer application

The availability of computer-based programmes that assist students to record, organize and retrieve bibliographic information also introduced other features to the activity of student learning with information. For example, a university teacher (Nora) and final year undergraduate students (Feza and Fazil) associated the activity of learning with information with a systematic process of students recording and organizing information and information sources that they had retrieved earlier. On the same note, a university teacher, Wani, associated students' articulation of their understanding and the construction of understanding with the development of mediating artefacts that could be assisted by the use of computer applications such as PowerPoint. In this light, the university librarians offered various training options, such as Microsoft Word and Powerpoint, and a few other computer programs that could help students to articulate their understandings.

8.3 Knowledge Discipline

My data showed that knowledge disciplines influence the activity of student learning with information, particularly in the areas of evaluation and selection of information sources, and the standardization of knowledge construction and its mediating artefacts.

Evaluating and selecting information sources

A university teacher (Onn) was of the view that different knowledge disciplines such as science, history, and literature employed different criteria for student evaluation of information sources and articulation of understanding. Another university teacher (Sam) elaborated the point by highlighting that, since his knowledge discipline tradition is rooted in literature or library research, he faced difficulty in convincing his colleagues of the importance of training students to develop a critical literature review. Sam said, following the tradition, some of his colleagues argued that "*when everything you write is supported by literature, there will be nothing to report in the discussion section*". Despite the argument, Sam continuously urged students to develop a critical literature review during his lectures because he had identified that was one of the ways to improve research quality within his knowledge discipline.

On the other hand, a university librarian (Lea) expressed that students' knowledge discipline was a good starting point to engage students in information searches. Specifically the knowledge discipline helped librarians to collect and subscribe relevant information sources for university teachers and research students. However, another librarian (Mia) was of the view that, when students worked with a very narrow research topic, they must be able to work across multiple knowledge disciplines in order to retrieve relevant information sources. Accordingly Mia encouraged students to use the Library of Congress Subject Heading (LCSH) that enabled them to learn about their research topic across multiple knowledge disciplines, as she relates below:

> *We taught students Library of Congress Subject Heading (LCSH), which I sometimes feel is very basic and that students do not need to know about...But when I look at LCSH, I realize that they have options of 'Use for' and 'Related terms'. Sometime, students have a specific research topic which not available in LCSH...So I thought that if I didn't teach them about related terms, broader terms, narrower terms, they won't be able to see that 'If my topic is very specific, I can look up for its broader terms; [and] if it is too general, I can look up for its narrower terms'. (Mia, a librarian)*

Standardizing knowledge construction and its mediating artefacts

Moreover, university teachers (Ana and Onn) expressed the view that following certain standards widely accepted within students' knowledge discipline, students would be ensured of their access into particular knowledge disciplines or scholarship communities. As explained by Ana and Onn below, among other factors the standards would cover the way students presented their understanding and the construction of the understanding via various mediating artefacts such as journal articles, poster presentations and theses:

> *Our classes enable students to present their research findings as either a journal publication or poster presentation. If they want to present their work via poster presentation in a conference, they should be able to do that because we have already trained them in our classes. (Ana, an academic writing teacher)*

> *Then we told them what a thesis is. It is an evidence of scholarship, which is the objective of developing thesis or dissertation. Thesis is a process of developing a standardization of knowledge. (Onn, an academic writing teacher)*

8.4 Academic Research

The university teachers viewed that the activity of student learning with information supports students' research activities in the university. As indicated by the university teachers (Ana, Onn and Wani), student engagement in structured classroom activities involving information need, accessing, interacting and using information from multiple sources to construct, articulate and reflect supported knowledge would assist their final year undergraduate students to complete their theses on time. Likewise Nora believed that the activity of learning with information employed across her classroom activities

helped postgraduate students to survive their postgraduate study which is underpinned by students' independent ability *"to search, access and process information"*. Similarly a teacher (Sam) experienced that the employment of the activity of learning with information in his classroom learning supported his research method undergraduate and postgraduate students.

Following the goal to engage students in research activities, teachers employed various strategies to engage their students in the activity of student learning with information. As a university teacher (Ana) explained below, through engaging her students in the activity of student learning with information, she was able to engage students in the different phases of research activities:

> *My course has various classroom activities. First, students need to develop a research proposal which would help them to conduct research for their thesis, which accounts for six units of students' learning. When students conduct their own research, they often do not have textbooks because most research is based on journal articles. So, in my course, firstly, students develop a proposal; secondly they go to the library; thirdly they produce a poster presentation; fourthly they engage in journal club activities, and many other activities. (Ana, an academic writing teacher)*

Similar to Ana, other university teachers considered, by acknowledging the university librarians' experience and skills, and joining the information skills programmes run by the librarians, students would be able to engage in authentic research activities through acquiring knowledge, skills and confidence in information search and retrieval, and accessing relevant, scholarly, recent, and comprehensive information within electronic and online databases.

8.5 Workplace Context

Following the university teachers' experience and perception that the students' success stories were parts of their own achievements, Ana, Onn, and Wani confessed that one of the goals of engaging students in the activity of learning with information was to develop graduates who were sought-after in the job market. Accordingly, the university teachers formed certain features in the activity of student learning to suit the current demands of the job market. For example, Onn thought that potential employers require graduates who are confident and able to search and use relevant information to perform their work independently. Consequently, Onn required his students to join information skills programmes and later complete the activity of learning with information successfully. By doing so, Onn expected that the students would acquire sufficient knowledge, skills and confidence to independently search and use information from multiple sources to inform their work. On the other hand, Ana believed that, by

providing her students with the necessary knowledge, skills, and experience to work in the academic world, the students would be able to do so after their graduation. During her academic writing classes, Ana trained the students to apply a writing standard and format acceptable by their knowledge discipline community while preparing for their classroom assignments, i.e., the development of a journal article from a previous thesis, poster presentation of the journal article, and research proposal.

Another teacher (Wani) was of the view that current employers looked for graduates who were able and willing to articulate and communicate their ideas effectively with colleagues, administrators and subordinates. As a result, Wani encouraged her undergraduate students to communicate their understanding and its construction during classroom learning or in her consultation hour outside the classroom learning. Although Wani confessed such efforts consumed a lot of her time, she continued to persevere because she wanted to train the students to articulate, communicate and later reflect their knowledge with a group of people in an effective manner. On a similar note, another university teacher (Sam) encouraged mixed-gender student interaction. Although such interactions were commonly discouraged in his department, he ensured that male and female students worked collaboratively to search for and use information in order to write and present their group assignment. Personally Sam felt that such activities were necessary to prepare students for their future employment which requires students to interact and work with people from different genders without any gender-bias or discrimination whatsoever.

8.6 Local Context

My data analysis indicated that the university teachers, librarians and students experienced and perceived that structured and integrated approaches were the most suitable for engaging the university students in the activity of student learning with information due to the local education practice and framework.

Local practice

A university teacher (Nora) considered that the Malaysian community in general do not read much during their leisure time. She associated this practice with low library usage among university students and their ignorance of the library collection and facilities. In view of this low usage and knowledge, Nora thought that structured information skills programmes which were integrated across classroom learning were an essential feature

of student learning of information skills within the university. Together with classroom activities and student–teacher interaction, Nora believed these programmes would slowly and steadily expose students to the necessary knowledge and skills related to students' access and retrieval of information and its sources, and ultimately help students to become independent learners. As she explains:

> *We need to have assignments that require students to conduct an independent inquiry. We can suggest a few information sources so that they can search the sources on their own later... We can say to them, 'In order for you to complete your assignments, you need to go to the library and find this and this information'. Initially, we can provide them with keywords so that they will be exposed to searching for information on their own (Nora, an information technology teacher)*

On the other hand, a university librarian (Mia) considered that the structured and integrated information skills programmes in the university suited the university students who were unwilling to come to the library and use the library collection of their own accord. According to Mia, the unwillingness was the result of a student spoon-feeding approach experienced by the university students during their school days. Apparently, the learning practice persists today; up to the point where the university library had been required to use the same spoon-fed approach, via classroom integration, in order to 'force' students to visit the university library and use the library collection as was commented on by the university librarians, Mia and Lea below:

> *Malaysian students don't have a sense of survival. From very early in their lives, they have been spoon-fed; now, even to get them to use library, they need to be spoon-fed. (Mia, a librarian)*

> *Instead of tackling students who come to the library on their own accord, we can see a faster result of students searching and accessing the library collection and services when the instruction is given by teachers. (Lea, a librarian)*

Similar to Mia, another university teacher (Onn) believed that the school learning practices had trained the university students to become dependent on classroom teachers and as a result lessens the students' accountability for their own learning processes. Accordingly, Onn thought that a structured and integrated approach was the most appropriate for engaging the university students in searching and retrieving information and its sources from the university library, and thus encouraging independent learning being practised in the university. As he stated below, classroom teachers played an important role in assisting student participation in the activity of learning with information:

> *But students need to be exposed to searching and accessing information sources. And I think the most relevant way to do that is via a term paper...At least in one course, a teacher gives one topic which requires students to search for information sources. (Onn, an academic writing teacher)*

Onn thought that classroom teachers, at a minimum, should include student term papers in their classroom assignments as the term paper would create the need and motivation for students to go to the library and search, access, retrieve and use the library collection in their learning process.

The university students also supported the views of Mia and Onn, commenting that the structured and integrated approach of the student information skills programmes conducted in the university suited their learning practice. For example, an undergraduate final year student (Razak) had experienced that it was the classroom learning that set the 'rhythm' of sorts for him to go to the library and use its various facilities and collections. As Razak illustrated below, his engagement in the process of accessing and retrieving information and its sources was facilitated by the fact that his information skills programme was an integral part of his classroom learning:

> *I think it is better to have student information skills programs integrated in our classroom learning…Sometimes we want to go to the library, but at the end, we don't…Sometimes we don't pay much attention if we do it on our own. When it is integrated into a class, the program becomes compulsory. When it is compulsory, we are already tied to the program, so we just have to follow it. If we have to go to the library on our own, we will probably go only once or twice and then we don't want to go anymore. If it is integrated into our classes, we need to do the information skills assignment. We would not do it if we go to the library on our own. (Razak, a final year undergraduate student)*

Besides that, my data analysis also indicated that local practices that focused on strengthening the inter-racial relationship between multiple ethnicities in the country had informed the employment of the collaborative learning approach in the implementation of the learning activity. For example, where possible, a university teacher (Onn) required his students to form groups comprising of students from different ethnicities, i.e., Malay, Chinese and Indian, for their group work assignments. Onn said that by collaboratively searching and using information from multiple sources, he hoped the students were able to work with individuals from different ethnicities and live in harmony in this country, as he related below:

> *We want student involvement in the classes. We want student to interact with each other and to develop harmony between the various races... If groups were dominated by certain races, we just switch them up. (Onn, an academic writing teacher)*

Local education framework

Finally, my data analysis also indicated that the implementation of the Malaysian Qualification Framework (Malaysian Qualifications Agency, 2007) in higher education institutions had reinforced the implementation of the activity of student learning with information across classroom learning. Subscribing to the ideas of outcome-based

learning, the framework stipulated that the university students must, upon the completion of their study, know, understand, and demonstrate eight domains of learning outcomes as prescribed by the framework. The two domains of the learning outcomes dwelt on students' mastery and demonstration of content knowledge and skills, while others were concerned with six generic skills: social skills and responsibilities; values, attitudes and professionalism; communication, leadership and team skills; problem solving and scientific skills; information management and lifelong learning skills; and managerial and entrepreneurial skills.

Moreover, the national education framework required the identified learning outcomes to become the basis for the development of curriculum, teaching and learning and student assessment within the university. In this light, following the framework, a university teacher (Wani), explained that the activity of student learning with information was not only designed to assist students to master their content knowledge and practical skills, but also to develop students who were fluent and able to apply the identified generic skills. In addition, the application of the national education framework across classroom learning suited the various forms of formative evaluation used by the university teachers to assess student engagement and completion of the learning activity. Among the assessment tools employed by the university teacher to assess student engagement and the completion of the learning activity are student information skills assignments and attendance; classroom attendance, participation and presentation; and writing, presentation and defence of a research proposal, article and poster presentation.

8.7 The University Context

My data analysis revealed that the mission of the university and communities within the university had formed and informed the way the activity of student learning with information was designed and implemented within the university.

The university education framework

In 11th October 2006, the university was identified by the government as one of four 'research universities' in Malaysia. This recognition placed a responsibility on the university to increase its research and consultation activities and establish lifelong education programmes that support the development of national human capital for a knowledge economy (Shahabudin, 2008). Later, based on the requirement of the

Malaysian Qualification Framework (Malaysian Qualifications Agency, 2007), the university developed its own working documents (e.g., Pusat Pembangunan Akademik, 2008a, 2008b) which prescribed student-outcome-based learning as the foundation for the design and implementation of classroom teaching and learning across its academic programmes. Table 13 and Table 14 show the national and university student learning outcomes for bachelor degree and masters students, and doctor of philosophy students respectively.

Table 13: The national and university student learning outcomes for degree and master programmes (Malaysian Qualifications Agency, 2007; Pusat Pembangunan Akademik, 2008a)

National student learning outcomes	Degrees	The university student learning outcomes
• Demonstrate knowledge and comprehension on fundamental principles of a field of study, acquired from advanced textbooks • Use the knowledge and comprehension through methods that indicate professionalism in employment • Argue and solve problems in their field of study • Show techniques and capabilities to search and use data to make decisions having considered social, scientific and relevant ethical issues • Communicate effectively and convey information, ideas, problems and solutions to experts and non-experts • Apply team and interpersonal skills which are suitable for employment • Possess independent study skills to further their studies with a high degree of autonomy.	Bachelor programs	• Demonstrate mastery of knowledge content (cognitive, and practical/professional domains) • Demonstrate six humanistic skills which cover the following 13 generic skills: 1. Social responsibility 2. Appreciation of environment 3. Ethics, morale and professionalism 4. Inner strength 5. Communication 6. Leadership 7. Teamwork 8. Scientific methods, critical thinking, problem solving and autonomous decision-making 9. Information technology and communication skills 10. Lifelong learning skills 11. Globalization skills 12. Entrepreneurship skills 13. Management skills
• Demonstrate continuing and additional knowledge and comprehension above that of the bachelors degree and have capabilities to develop or use ideas, usually in the context of research • Use knowledge and comprehension to solve problems related to the field of study in new situations and multi-disciplinary contexts • Integrate knowledge and manage complex matters • Evaluate and make decisions in situations without or with limited information by considering social responsibilities and related ethics • Deliver clearly the conclusion, knowledge and the rationale to experts and non-experts • Demonstrate study skills to continuously progress on their own with a high degree of autonomy to do so.	Master programs	• Demonstrate knowledge and extensive or additional understanding from undergraduate level, and develop or apply ideas in the research context • Apply knowledge and understanding to solve current problems in the field of study and in the context of multi-discipline • Integrate knowledge and manage complex issues • Evaluate and make decision with or without limited information in a responsible and ethical way • Communicate clearly research findings, knowledge, and their rational to experts and non-experts • Master learning skills and autonomy for continuous self-development

Using the eight domains of learning outcomes prescribed by the national education framework, the university developed their own working documents to guide the development of curriculum, and teaching and learning, and student assessment within the university (e.g., Pusat Pembangunan Akademik, 2008a, 2008b). Table 13 and Table 14 also illustrate the eight domains of learning outcomes developed by the university that underpin all teaching and learning activities in the university, including the activity of student learning of information skills.

Table 14:   The national and university student learning outcomes for doctor of philosophy students (Malaysian Qualifications Agency, 2007; Pusat Pembangunan Akademik, 2008a)

National student learning outcomes	Degrees	The university student learning outcomes
- Show a systematic comprehension and in-depth understanding of a discipline, and mastery of skills and research methods related to the field of study - Show capabilities to generate, design, implement and adopt the integral part of the research process with scholarly strength - Contribute to the original research that has broadened the boundary of knowledge through an in-depth dissertation, which has been presented and defended according to the international standards, including writing in internationally refereed publications - Make critical analysis, evaluation and synthesis of new and complex ideas - Communicate with peers, scholarly communities and society at large concerning the field of expertise - Promote the technological, social and cultural progress in a knowledge based society in the academic and professional contexts	PhD programs	- Show a systematic and in-depth understanding in a knowledge discipline, and a mastery of research skills and methodology related to the discipline - Demonstrate an ability to generate, design, implement, and modify research process with a strong scholarship foundation - Contribute to original research which broadens the boundary of knowledge via in-depth dissertation which had been presented and defended using international standards; including refereed and international publication - Conduct critical analysis, evaluation, and new and complex synthesis - Communicate with peers, scholar community and public about own expertise - Encourage a development in technology, social and culture in the knowledge-based society in the academic and professional context

Benchmarking her undergraduate students' performance against the university learning outcomes, a teacher (Wani) found that the students lacked information problem-solving skills; demonstrated by their inability to independently search, use, and transform information from multiple sources. She spent extra time and effort outside the classroom to engage students in learning tasks that help them to acquire and apply the skills within their classroom learning. Similarly, another teacher (Onn) benchmarked his classroom learning with the attainment of the university learning outcomes related to

communication skills. Onn employed an interactive classroom concept which required students to independently search and use information from multiple sources to construct personal understanding prior to the classroom learning while sharing or negotiating the understanding during classroom learning.

Likewise, a final year undergraduate student (Razak) was of the opinion that the outcome-based learning approach employed by the university had provided explicit reasons for students to participate and complete the steps of the activity of student learning with information independently from their classroom teachers and learning as he explained:

> But at the university, our lecturers only teach a little, but so many things are included in our examination. Our lecturer said that if we want to answer our examination questions, we need to read and search for information on our own. Furthermore, we need to follow a new format of learning: for one hour of lecture, we need to conduct two hours of independent study outside our classroom learning (Razak, a final year undergraduate student)

The research university framework

The university teachers and librarians perceived that the university's status as one of research universities in Malaysia provided a direction and working framework for different communities of practice within the university to attain the university mission of transforming the university graduates into the creators of knowledge and innovation. Following the research university framework, the university teachers integrated the activity of student learning with information across their classroom learning to assist students to identify the need for new understandings, and later construct and reflect the understanding which was an essential component in the knowledge and innovation creation process.

Simultaneously, the research university framework pushed the librarians to go beyond their comfort zone to go to different department and residence colleges within the university in order to facilitate the process and activities of independent and lifelong learning necessary to transform the graduates into knowledge and innovation creators. In addition to the student information skills programmes that were conducted, the university librarians also liaised with heads of departments and principals of student residence colleges within the university to promote, and later conduct, student information skills courses at individual departments and residential colleges. Moreover,

the university librarians organized various programmes within and outside the library using Microsoft Word, PowerPoint and Dreamweaver in order to help students to use the computer applications to assist them to articulate and reflect their knowledge via the production of multiple forms of mediating artefacts.

The university administration system

A university teacher (Sam) used the university staff annual assessment to integrate student information skills programmes in the activity of student learning with information. For example, by providing an appreciation letter to the university librarians who facilitated his students' information skills programmes, Sam hoped the letter would become handy during the librarians' annual assessment, and therefore increased the librarians' motivation to conduct the programs for his students.

Likewise, due to the university staff annual assessment that identified a student-based learning approach as one of the assessment components for the university teachers, a teacher (Onn) transformed his classroom learning approach from examination-based learning to student-based learning that highlighted student–teacher interactions within the classroom learning as he explained:

> *It has nothing to do with the teaching paradigm! It depends on the university. In the past, I think during the 1980s, our university focused on examination-based classroom learning, so we employed examination-oriented learning approaches in which our key performance indicator is teaching. Later, during the 1990s, our university says that classroom learning should be more interactive, so we needed to make our teaching more interactive. But I observe in my classes, not all students want to become interactive, you know. (Onn, an academic writing teacher)*

However, Onn discovered that some of his undergraduate students were unwilling to participate in his classroom learning. Nevertheless, Onn persisted in employing various strategies to reinforce student–teacher and student–student interaction within his classroom learning as Onn viewed that both he and the students would be assessed by the university in terms of their engagement in interactive and participative teaching and learning activities. Among the strategies that Onn often employed were questioning his students during lectures and tutorial classes, assigning group and individual assignments to students, conducting classroom discussion and presentation, and student consultation outside classroom learning. Interestingly, while employing these strategies, Onn persistently safeguarded his students' dignity because he perceived that whenever

teachers injured students' dignity, they damaged the students' potential emotional and cognitive growth.

However, Onn also noted that the university financial system had restrained him from formally acknowledging the role of the university librarians within his classroom learning at the department and university level. Due to the high number of students, the university librarians needed to run a few series of information skills programmes for Onn's students. Moreover, on the top of their daily tasks in the library, the librarians also spend time outside their working hours, usually during the night or over the weekend, to grade information skills assignment of Onn's students. Despite the university librarians' extra efforts, the bursary department in the university told Onn that it was impossible for the university to provide a financial remuneration for the librarians because the student information skills programmes were run by the librarians within the university premises and within working office hours.

The university infrastructure

University teachers (Ana, Nora and Onn) and postgraduate students (Joe, Nori and Wina) considered that the university's information technology infrastructure informed the features of student information access and retrieval in the activity of learning with information. Accordingly, although the students acknowledged that the university had spent millions of ringgit (MYR) to subscribe to online databases in their areas of study, they were unable to use the databases at the optimum level if the university current computer system and infrastructure did not support external and real time access to the databases outside the university area. On a similar note, final year undergraduate science students (Razak, Feza, and Fazil) also noted that laboratory buildings, materials, and equipment influenced the process and timeframe of the learning activity with information within the university.

8.8 The Department

The university teachers and librarians thought that centralized student information skills programmes that were "*coordinated*" (Onn) or "*synchronized*" (Lea) at the department level would expose a larger number of students to knowledge and skills related to information search and retrieval, and thus to the activity of student learning with information. A university teacher (Onn) was of the opinion that there is a need for departments to coordinate the programmes to ensure they become integral parts of

student classroom learning within the department. A university librarian (Lea) added that, while the department coordination would expose more students to knowledge and skills related to information search and retrieval from multiple sources, the library could synchronize the programmes with the departments' needs, requirements, schedules or activities. Furthermore, another university librarian, Azi, stated that such coordination would ensure a continuity of students' access to the courses, as the programs would no longer depend on specific teachers or courses.

In this regard, a final year fresh postgraduate student (Wina) was disappointed that her department did not organize any information skills sessions for postgraduate students earlier in their studies. Wina confessed that she and her classmates, just by chance, discovered the programmes in her final year when a classroom teacher from their elective course, Nora, integrated the programme in their classroom learning. Following her experience, she strongly believed that a structured and compulsory-made student information skills programme coordinated at the department level would expose students to sufficient knowledge and skills related to information search and retrieval from multiple sources. She added that the department should also provide photocopy services to students which would help students to "*grab information at that particular instant*" before it "*just flies away*" from them. On the other hand, a librarian (Lea) noticed that students in certain departments were more proactive in learning about searching or using the university library collection in relation to other departments. For example Lea complimented students from the Engineering Department for taking initiatives to form their own groups and coming to the library to request tailored information skills programmes for their groups.

Teachers (Ana, Onn and Wani) also collaborated with their colleagues at the department level to provide authentic and meaningful independent learning experiences to their students. Among others, their colleagues, who were the students' supervisors, were required to provide a sample of an excellent thesis to the students in order for the students to familiarize, read, analyze, synthesize, articulate the thesis into various forms of mediating artefacts of knowledge and the construction of knowledge, such as journal article and poster presentation. The university teachers also required their colleagues to attend and assess the students' poster paper presentations, as well as research proposal presentation and writing.

However, teachers (Nora, Onn and Wani) acknowledged that not all teachers share their views and effort in this regard. Nora observed that some teachers in her department assumed that postgraduate students are adult learners and that therefore they should independently acquire the necessary knowledge and skills to engage in the activity of student learning with information such as the knowledge and skills related to information search and retrieval. Accordingly, these teachers were often unwilling to share useful tips with students on how they could better engage in the activity. On the other hand, one university teacher (Sam) indicated that a lack of mutual agreement among teachers at the department level could hamper the process and product of student usage of information from multiple sources. Sam commented that, due the disagreement between teachers at his department over the development of a critical literature review in students' research proposals, he was not allowed to allocate a lecture on literature reviews in his research methods course. Moreover, due to a lack of mutual accountability in engaging students in the activity among teachers in his department, Sam confessed that as a teacher who taught a research methods course, he often had been blamed by his colleagues during department meetings for students' mistakes in thesis writing. For example, rather than the students' supervisors, Sam was often blamed by his colleagues for any thesis abstracts that were inappropriately written by students in their department.

8.9 The Library

Supporting the university mission statement, the university library run information skills programmes to assist the transformation of the university graduates into knowledge workers fluent in computer technology, and who are able to access, use, and synthesize information (Economic Planning Unit, 2006). With the introduction of the national education framework, information skills courses in the university were employed by the university library to support the implementation of the student-outcome-based learning within the university. The programmes were conducted at personal, group, classroom and departmental levels, and among services offered by the university library to assist students acquiring and demonstrating skills related to searching and accessing information from multiple sources; these were considered necessary to support student-outcome-based learning across classroom independent learning.

On a personal level, students could meet librarians at the library helpdesk during the library's opening hours. This service provided basic assistance to students on the structure and organization of the library collection and services including the available schedules for student information skills programmes. Alternatively, students could form their own groups and negotiate with librarians for tailored information skills sessions that suited groups' information needs. Otherwise classroom teachers could request librarians to conduct structured information skills programs for their classes, which might consist of an information skills assignment developed by the librarians. For assignment-based programmes, librarians structured these to assist students' assignment completion and allowed students to see them for consultation before submitting the assignment to the librarians for grading purposes. While this type of programme was often conducted in the library's computer rooms, non-assignment-based programs were often conducted in multiple venues, such as in the audiovisual, computer rooms, and lecture halls in the library as well as in student classrooms. Finally, the librarians delivered basic information about the library collection and services during student orientation programmes at individual university departments within the university. Librarians also divided the new students into smaller groups which had to attend the library tours during orientation week.

Finally, my data indicated that the university library mission and its operations had been geared toward the transformation of university students into lifelong learners and innovators following the development of students' learning outcomes in the university as well as the appointment of the university as one of the country's research universities. Translating the university and library missions into their own, the university librarians viewed that their primary responsibility was to facilitate the transformation process of the university students into lifelong learners via their engagement in teaching, learning and research activities in the university.

To fulfill the university library's responsibility, the librarians considered that classroom teachers were the missing link between the university library collection and the students. Accordingly, the librarians decided that the best approach to expose the university students to the library collection was by integrating student information skills programmes within classroom learning. To this end, the university librarians not only maintained good relationships with existing teachers who were continuously enrolling

their students in library programmes, but they also developed an outreach programme to promote their courses to heads of department and principals of college residences within the university in order to engage more students in retrieving information from the multiple sources available in the library collection.

On the other hand, the university librarians cautioned that the perceived superior status of the university teachers over librarians within the university could interfere with the transformation of the university students into knowledge and innovation creators if teachers chose not to collaborate with the university librarians. Although the university and library were ostensibly working towards the same goal, still a lot of the university teachers were silent about their role as a 'link' between the library collection and the students. As a result, although the librarians had taken the initiative in promoting and conducting student information skills programmes, due to the perceived status of classroom teachers over librarians, students would be likely to join the programmes whenever the teachers required them to do so or when the programmes had become an integrated feature of classroom learning.

8.10 Academic Programmes

My data analysis also showed that there were distinct classroom interaction patterns among undergraduate and postgraduate students that influenced student engagement in the activity of learning with information. University teachers (Nora and Sam) and postgraduate students (Jannah, Maya, and Nori) indicated that postgraduate classroom learning was characterised by students' articulation, justification and reflection of their personal understanding. Accordingly there was an urgent need for postgraduate students to search and read information from multiple sources in order to construct their personal understanding prior to their classroom learning. On the other hand, although teachers (Onn and Wani) said that their undergraduate classroom learning was notable for teacher–student interactions, due to a huge number of classroom topics that teachers needed to cover during their lectures, there tended to be less student–teacher interaction in undergraduate classroom learning. In contrast with postgraduate classroom learning that featured students' articulation, justification and reflection of their personal understanding, such features were noticeable in undergraduate classroom learning only occasionally such as when undergraduate students were required to present their research proposals at the end of the semester.

8.11 Summary

In this chapter I have discussed findings that revealed the university teachers, librarians and students experienced and perceived that the features of the activity of student learning with information within the classroom context were formed and informed further by multiple social contexts located outside the classroom context. The social influencing contexts identified in the study were the information age, knowledge discipline, academic research, workplace context, local context, the university, the department, the library, and academic programmes. However, emerging from the study is that the teachers, librarians and students further experienced and perceived that personal factors interplay in the learning activity, as discussed in the following chapter.

CHAPTER NINE: PERSONAL CONTEXTS FOR THE ACTIVITY OF STUDENT LEARNING WITH INFORMATION

9.1 Overview

This chapter aims to answer my final research question, i.e., how do university teachers, librarians and students who engage in student information skills programmes experience and perceive the interplay of personal factors in student learning of information skills? My data showed that the university teachers, librarians and students experienced and perceived that student learning with information was influenced further by the personal contexts of those engaged in the student learning. As discussed below, personal assumptions, goals, efforts, skills, experiences, emotions, preferences, age, ethnic and gender of the university teachers, librarians, and students were identified by the study as personal influencing contexts for student learning with information. This chapter also explains the role of the personal contexts in facilitating and sustaining students' engagement in the activity of learning with information.

9.2 Fulfilling Personal Learning Assumptions

My data analysis showed that personal assumptions about university learning had influenced the way the university teachers, librarians, and students engaged in the activity of student learning with information. A university teacher (Onn) and librarians (Azi, Lea, Mia and Sal) associated the university learning with the practice of "*lifelong learning*" which is underpinned by the independent activities of students searching, using and transforming information from multiple sources into their personal understanding. Likewise, using the term "*independent learning*", teachers (Ana and Wani) associated the university learning with student activities of searching, accessing, selecting, and "*digesting*" relevant information from authentic and recent sources independently from their classroom teachers. Following their personal assumptions about university learning, the university teachers included information skills programmes, discussion, question-and-answer sessions, and term-paper writing as

classroom activities and assignments that required students to search, retrieve and use information from relevant, comprehensive and recent sources to independently develop, articulate and reflect an understanding and the construction of understanding within and beyond the classroom learning.

Associated with this, a university teacher, Onn, believed that the university students' inability to align their personal learning assumptions with those of the university had influenced their engagement in the activity of learning with information. Onn commented that some of his undergraduate students expected him to provide "*questions and answers*" for their final examination, an expectation that Onn thought could be traced back to students' learning assumptions developed during their school days. This failure to align their personal and university learning had prevented these students from taking personal responsibility for their own independent searching and accessing, interacting, analysing, and synthesizing information. In this respect Onn said that, at the beginning of every semester, he shared with his students the university's expectations of them and the consequences if the students failed to fulfil the expectations, and a few tips on how to survive his course (which included the importance of the students' engagement in independent learning outside their classroom learning).

University teachers (Nora, Onn and Wani) also agreed that there was a need for the teachers to realign their personal assumptions about students' ability to engage in the independent activity of learning with information with the students' diverse backgrounds and experience. For example, although postgraduate students were assumed to be able to independently search, retrieve and use information, Nora adjusted her assumptions according to her students' diversity. Accordingly, she integrated information skills programmes into her classroom learning in order to expose students who were unfamiliar with online library environments and information sources. Another university teacher (Wani) assisted her undergraduate students to become independent learners and critical thinkers. For example some undergraduate students would come to her office and request answers for their classroom assignments. Although it was easier and faster for Wani to provide the answers, Wani trained them to become critical thinkers (and ultimately independent learners) by questioning the students in a step-by-step fashion until the students came up with their own answers.

The importance of students' alignment of their personal assumptions with the university learning assumptions was supported by two final year undergraduate university students (Cheng and Razak). Specifically, Cheng commented that *"university learning requires students to become independent learners"* and experienced *"university learning"* as a shift in the teachers' role i.e., from being the *source of knowledge* to being *facilitators of the knowledge construction*, while Razak experienced *"university learning"* as students engaging in the learning activities beyond classroom learning. Familiar with the spoon-fed and classroom-learning approach that they had experienced during their school days, Cheng and Razak took a considerable time to align their personal learning assumptions and actions to reflect university learning; a position which had been stimulated by their non-performance in their study during their first year. Learning from their mistakes, Cheng and Razak now followed the requirements of their classroom learning which was based mostly on the activity of learning with information. Additionally, Cheng gradually realigned his expectation of teachers as the source of knowledge to teachers as the facilitators of the construction of the knowledge, while Razak realigned his locus of learning from classroom learning to beyond the classroom learning.

On a similar note, the university librarians (Azi and Mia) highlighted that there is a need for the university students to realign their learning assumptions of *"learning from teachers"* to *"learning with multiple learning collaborators"* in the university environment. It follows that university students must acknowledge the university librarians as one of the collaborators of learning by trusting the university librarians' expertise in helping them with information access and retrieval. This was particularly true for postgraduate students who had a low expectation for the librarians' assistance—which often led to ineffective (or nil) interaction between the students and librarians. A final year postgraduate student (Wina) supported this view when she confessed that it had never crossed her mind to consult librarians prior to her information skills programmes because she *"thought"* that she *"knew everything"* about information search and retrieval. It was only during the programmes that Wina realized how much knowledge, skills and experience that the university librarians had and that she regretted her decision to not consult the librarians on her information search and retrieval earlier in her study.

On the other hand, a teacher (Nora) associated university learning with "*self-directed*" or "*self-accessed*" learning activities in which students independently search for information from multiple sources at their own pace, regardless of time and place. Interestingly, using this perspective, Nora was of the view that the current library practice that 'requires' students to join information skills programmes or to consult librarians at the library helpdesk in order to learn about information searching processes might become barriers for students to participate in self-directed learning activities. Instead, Nora suggested that librarians should provide self-accessed, interactive, electronic or online services that facilitate students' learning about and using the library collection at their own pace without any barriers or intermediaries. Likewise, a postgraduate student (Rosli) and an undergraduate student (Cheng) commented on the lack of self-accessed or self-directed facilities or information that could assist the university students to access, search and retrieve information from traditional or online sources available in the library without the need to see the university librarians. Similarly, the lack of self-accessed and self-directed information sources resulted in fewer sources used by the students in the student activity of learning with information. For example, postgraduate students (Joe, Nori and Wina) confessed that students faced problems in accessing most of library online databases outside the university premises. Accordingly, most of the time, they used information from only one or two databases for their activity of learning with information which were accessible from their homes.

However, the university teachers assumed further that university learning not only required the university students to develop their understanding independently, they needed to articulate and reflect that understanding with their classroom teachers, peers, and topic experts. Additionally, university teachers (Onn, Sam and Wani) associated university learning with students developing, sharing, and reflecting their understanding and the construction of the understanding with classroom teachers and peers, thesis supervisors and examiners, and experts. Likewise, students found that the university learning required them to work collaboratively with classroom teachers and peers. For example undergraduate students (Cheng and Razak) searched and shared information from multiple sources with members of their study groups to save time. Moreover, postgraduate students (Jannah, Naim, Nori, and Wina) and final year undergraduate students (Cheng, Razak, Fazil, and Feza) experienced university education as collaborative learning activities that required them to articulate and justify their

understandings with their study group members, and classroom teachers and peers. My data analysis indicated that, while undergraduate students (Cheng, Razak, Fazil, and Feza) and a postgraduate student (Jannah) preferred to reflect on their learning with classroom teachers and peers *outside* their classroom, other postgraduate students (Naim, Nori and Wina) preferred to do so *during* their classroom learning. On the other hand, a university teacher (Wani) and a final year undergraduate university student (Razak) observed that there were university students who assumed that the more information they were able to hoard from their classmates, the better their grade would be. Wani refuted this assumption by saying that this expectation might be true in schools that focused on rote learning, however such an assumption would hamper the students' university learning as it would prevent them from collaboratively sharing and using information from multiple sources to construct their understanding, and collaboratively articulating and reflecting the understanding and the construction of the understanding with their peers.

Finally, university teachers (Onn and Sam) further stated that university learning also required students to engage in "*scholarly*" learning activities that involve "*a process of developing a standardization of knowledge*" (Onn). Sam applied his assumption about university learning in the context of his research method courses; he assessed his postgraduate students' scholarship in term of their ability to develop and present a critical, recent and informed literature review during their research proposal presentation. On a bigger scale, Onn was of the view that the university learning constituted student engagement in "*scholarly*" activities that involved a critical evaluation process in which students' understanding and its construction would be reflected and assessed as sufficient "*evidence*" to confer the students' scholarship. Following this assumption, Onn designed his academic writing classroom with activities and assignments that engaged students in writing, presenting and reflecting systematic and scientific research proposals and reports that were acceptable by the students' knowledge discipline community.

9.3 Attaining Personal Learning Goals

My data analysis showed that the development and attainment of personal goals had influenced the participant engagement in the activity of student learning with information. For example, reflecting their role as an lifelong learning educators, the university teachers and librarians associated their engagement in the student activity

with the attainment of long-term and noble personal goals of transforming the university students into independent learners (Ana, Nora, and Wani), lifelong learners (Onn, Azi and Lea), scholars (Onn and Sam), talented individuals (Onn), and members of communities of practice of knowledge discipline and workplace (Ana, Onn, Sam and Wani). The university postgraduate students also reported that their engagement in the student activity was an attempt to transform themselves from learners into experts within their knowledge discipline (Naim and Joe) and classroom context (Nori), and well-informed contributors to the well-being of their families, and local and workplace communities (Jannah and Nori). The data also showed that the university students' engagement in the student activity was to achieve relatively short-term personal goals such as to attain a good grade for their classroom assignments and examination, and complete their university study successfully. For example, postgraduate students (Jannah, Joe, Nori, Rosli and Wina), and final year undergraduate students (Cheng, Razak, Fazil, and Feza) engaged in the student activity in order to complete the classroom assignments and theses necessary for their university graduation. Additionally, Razak and Cheng shared and used information and its sources with their study group members in order to develop a sufficient understanding about their classroom topics that would help them to do well in their mid-term and final examinations.

The data analysis indicated that short-term goals provided sufficient intrinsic motivation for the university students to engage in the activity of student learning with information. For example, the university teachers supported the notion that instant rewards for the university students were essential to engage them in student activity. A university teacher, Ana, graded every learning artifact that her students developed during their participation in the activity because she believed that "*without the grades*", students would not "*give their best*" in completing the activity. Similarly, another university teacher (Sam) motivated his students to read their course reading materials by informing them that the materials would be included in their "*mid-semester examination questions*". Sam commented that his strategy works well with his undergraduate and postgraduate research methods classes. However, the data analysis indicated that those with long-term personal goals appreciated that their engagement in every task of the student activity was a way to attain such goals, and thus chose to participate in the activity and its tasks. For example, a final year master student (Wina) chose to engage

in a project paper over a thesis because the project paper did not require her to present and reflect her understanding sufficiently to internal examiners thus enabling her to graduate from the university relatively sooner. Likewise, second year undergraduate students (Amy, Kay and Kam) chose not articulate their own understanding in their classroom assignments because they did not have the ability to write fluently. Accordingly, they copied pieces of writing from personal blogs and used them in their classroom assignments to obtain a better grade for the assignments. Accordingly, although short-term personal goals would be sufficient to motivate the university teachers, librarians and students to engage in the activity of student learning with information, it was the long-term personal goals that motivated them to maintain their participation in every step of the activity.

9.4 Making Personal Learning Efforts

Making personal efforts also emerged in my data analysis as another personal factor that influenced the university teachers', librarians' and students' engagement in the activity of learning with information. For students, once they had realized and compared their personal learning assumptions with the university learning assumptions, students needed to make conscious decisions and efforts to engage in the learning activity. For example, when a final year undergraduate student (Razak) realised that his lectures did not provide enough information to enable him to answer his examination questions, he decided to form a study group with his classroom peers in order to search and share necessary information regarding their classroom topics and assignments. Although Razak and his group members had tight time schedules and stayed in different residence colleges, they were committed to sharing information from multiple sources and reflect on each other's understanding during the night via Skype. Another final year undergraduate student (Cheng) confessed that, although it took him almost one year to learn to engage in the learning activity that required him to search and use information to construct and reflect understanding independently from his classroom teachers, he was finally able to perform tasks within the activity with the help of his study group's members.

Making personal efforts also emerged as an important factor for postgraduate students to complete their learning activity successfully. For example a first year postgraduate student with considerable work experience (Nori) said that, at the beginning of her study, she struggled to complete the learning activities on time because she was used to

being assisted by colleagues and subordinates in completing such tasks at her workplace. Due to her inadequate skills in searching for information from online sources, Nori also sought assistance from her young classroom peers who were good at searching and retrieving such information. Similarly, another postgraduate student (Naim) said that although he already had original and authoritative information sources, he spent more time searching and reading recent information from authoritative websites, and contacting and corresponding with a few experts in his area of study in order to validate his learning.

Moreover, students (Cheng, Razak, Naim and Nori) and teachers were of the view that managing time and reading were essential to ensure students completed the learning activity. Teachers (Onn, Sam and Wani) perceived that students did not make any efforts if they missed their lectures where the students would be given essential information related to their classroom topics and experience teacher–student interactions that would help students to personally contextualize the given information. Allied with this, Wani commented that some of her Malay undergraduate students confessed that they occasionally missed their lectures because they were "*involved in college activities*" that would sometimes end at "*two in the morning*". Although such activities would help students to secure their accommodation within the residence colleges in the university for the following semester, Wani commented that the activities diverted her students' time from engaging fully in every step of the learning activity with information.

The university teachers also agreed that students' commitment in engaging in multiple pathways of the learning activity via participating and completing their classroom activities and assignments was the key to completing the learning activity. However, some students "*chose*" (Onn) to disengage from the pathways by playing truant or distancing themselves from classroom attendance, activities and assignments. Accordingly, the university teachers were making various personal efforts to prevent or minimize these situations. For example a university teacher, Onn, reminded his students at the beginning of their class about consequences of students' non-commitment to their classroom attendance, activities and assignments towards their grades and university study. On the other hand, although most university teachers at Nora's department expected postgraduate students to be able to search and use information from multiple

sources independently from their classroom teachers, following the diverse experiences and backgrounds of her postgraduate students, Nora worked with the university librarians to integrate an information skills programme in her classroom learning. Similarly, when Sam learned about the benefit of information skills programmes to research students from a postgraduate student from a different department, Sam contacted librarians to integrate such a programme in his undergraduate and postgraduate research methods classes. Like other university teachers, a university teacher, Wani spent a lot of her time outside the classroom learning to train her students (via face-to-face and online interactions) to think critically and learn independently in order to assist the students to complete the learning activity on time.

Following the university library mission to increase the number of users of the library collection, the university librarians had made conscious and collective decisions and efforts to expose more students to the collection and train them to search and retrieve information from the library collection. Among others the university librarians had promoted and conducted student information skills programmes in all departments and residential colleges within the university in addition to the university library. Accordingly, the university librarians (Azi, Lea and Sal) often sacrificed their weekends and evening hours conducting the programmes and grading students' information skills assignments.

9.5 Employing Personal Learning Skills

The university teachers, librarians and students also identified that computer, higher order thinking, language, and communication skills influenced their engagement in the activity of learning with information.

Computer skills

The university teachers, librarians, and students were of the opinion that good computer skills facilitated students' engagement in the learning activity. The university teachers (Ana, Nora, Onn and Wani) considered that computer skills facilitated students' relevant and recent information search and retrieval within electronic and online databases subscribed to by the university library and available on the Internet. While Nora added that computer skills were useful for students to electronically organize and cite information and its sources during the articulation of their understanding, Wani viewed further that a combination of critical thinking and computer skills helped

students to develop effective mediating artefacts to communicate their understanding. Aware of the importance of computer skills in students' completion of the activity of learning with information, librarians ran information skills programmes to assist students to acquire computer skills that enabled students to search and retrieve information in electronic and online databases, write and present their understanding and its construction, and organizing information on the information sources used by the students in the construction of the understanding. Likewise, students identified that their computer skills had helped them to search online information from multiple sources easily and quickly, as well as to communicate with their classroom peers, and experts in their field of learning in real time.

My data analysis also indicated that the university teachers' computer skills also facilitated students' engagement in the learning activity. For example, due to their thesis supervisor's knowledge on the Endnote computer program (which organizes bibliographic information of multiple sources) final year undergraduate university students (Feza and Fazil) voluntarily joined an information skills programme run by the university library that exposed them to use of the program in their research proposals and other academic writing. A university teacher, Nora, also supported the importance of teachers' computer skills in facilitating student engagement in the learning. Specifically Nora highlighted the need for teachers to upgrade their computer skills pertaining to information search and retrieval from electronic and online databases particularly subscribed to by the university library in order to assist students to do the same.

Higher order thinking skills

The university teachers (Ana, Nora, Onn, Sam and Wani) noted that higher order thinking skills assisted the university student to complete learning activities successfully. Specifically, the university teachers associated the skills with students' abilities to logically, critically, creatively, reflectively, and independently use or "*digest*" (Ana) information from multiple sources to develop and articulate their understanding. Although teachers did not explicitly talk about the higher order thinking skills during classroom learning, they identified the application of the skills while grading mediating artefacts for the students' understanding e.g., students' research proposals, literature reviews, and other term papers. Moreover, a university teacher

(Wani) experienced that the lack of higher order thinking skills among her undergraduate students most often led to an inability to learn independently from their classroom teachers. Accordingly, to train the student to think in a critical and independent way, whenever her students asked her about their classroom assignments or topic, Wani would respond by reflecting the question back until the students answered their own questions.

Undergraduate students (Fazil, Feza, and Razak) and postgraduate students (Joe, Jannah, Naim and Wina) also agreed that higher order thinking helped them to successfully complete the learning activity. They said that they needed the skills in order to identify, extract, compare, contrast, and synthesize various ideas from multiple sources into their own understanding. For example, a young postgraduate university student, Joe, associated the skills with students' ability to search and retrieve relevant information from multiple sources, while another young postgraduate student, Wina, identified the skills with students' ability to articulate their understanding using a rigid format of reporting and referencing required by the university and classroom teachers. Lastly, a mature postgraduate student, Jannah, associated the skills with students' ability to present and justify their knowledge and understandings during their classroom discussions or question-and-answer sessions.

Language skills

The university teachers and students thought that students' mastery of the language in which the disciplines of knowledge were developed and expanded facilitated students' completion of the learning activity. For example, university teachers, Nora and Wani, considered that international students who come from non-English speaking countries would be able to articulate and present their understanding and the construction of the understanding better if they mastered an acceptable standard for academic English speaking and writing. On the same note, postgraduate students (Joe and Naim) were able to search, read, analyze, and synthesize information from original, authentic and current information sources due to their mastery of English and Arabic languages respectively, in which their knowledge discipline was developed. On the contrary, second year undergraduate university students (Amy, Kay and Kam) said that, because their English was not proficient, they faced difficulty in reading and understanding classroom reading materials which were available mostly in English. Accordingly they

used a lot of secondary information sources, such as personal blogs or translated books that were written in Malay language to complete their classroom assignments.

Communication skills

Study participants were of the opinion that communication skills also enabled students to better engage in the learning activities. A university teacher (Wani) said that communication skills enabled students to articulate and share their understandings to members of the classroom learning and knowledge discipline community—essential traits for graduates who compete in the job market. Similarly, another university teacher (Onn) pointed out that verbal communication skills assisted his undergraduate Chinese students to better share and reflect their understandings with him in comparison to his undergraduate Malay students who preferred to use body language which limited their articulation and reflection of their understanding via writing and verbal presentation which are the most applied modes of communication in the learning activity. Likewise, the university librarians (Azi and Sal) noticed that Malay undergraduate students often lacked confidence and communication skills while approaching the university librarians for assistance. They found that, conversely, Chinese and international students were more assertive than Malays in seeking the librarians' help in conducting information search and retrieval. Thus communication skills were important to help students to better engage in *all* steps of the learning activity, not just articulation and reflection of their understanding and the construction of the understanding.

I found that the university students discovered that communication skills were also important for the university teachers and librarians. Due to time constraints during lectures, final year undergraduate students (Hani and Lili) preferred to discuss their ideas with classroom teachers outside the classroom only if the teachers were open in their communication, i.e., were easily accessible to students and respectful the students' ideas. Likewise, other final year undergraduate students (Fazil and Feza) were also comfortable discussing their work with classroom teachers who did not look down on their ideas but reflected the ideas transparently and critically. A university teacher (Onn) also agreed that teachers who patronised and publicly embarrassed their students would destroy the students' motivation and talents. Similarly, undergraduate students (Amy, Chan, Kay, Kam, and Razak) and a university teacher (Nora) reported that librarians also needed to employ good communication skills while conducting information skills

programmes. While more interaction would help the librarians to identify and address students' needs or knowledge gaps related to the process of information search and retrieval in the context of the university library collection, the university students (Amy, Kam, and Kay) thought such interaction would help them to personalize the programmes' content and stay focused throughout the programmes.

9.6 Applying Personal Learning Experience

Personal experience emerged in my data analysis as another personal influencing factor that influenced the university students' engagement in the activity of learning with information. As discussed below previous experience constitutes both learning and work experience.

Previous learning experience

The university teachers, librarians and students were of the view that students' school learning experiences somewhat slowed down students' engagement in the activity of learning with information. A university teacher (Nora) associated the school learning experience with the primary sources of school learning, i.e., teachers and printed textbooks. On the other hand, university learning required students to independently search and use multiple information sources available in online environments and accessible via online retrieval systems. Due to a lack of usage of online tools in school learning, Nora said that new university students faced difficulty when searching and retrieving information from multiple sources independently from classroom teachers, and secondly to use online or electronic tools to search and retrieve information from multiple sources available in multiple forms.

Other university teachers also added that forms of mutual engagement developed and used by the university students during their school days did not prepare the students to engage in beyond classroom learning that underpinned university learning. A university teacher (Wani) considered that school learning was "*inclined towards spoon-fed*" (Wani) and "*drilling*" (Onn) learning approaches; activities that transformed the student–teacher relationship into taker–giver relationships in which teachers ultimately "*supply*" students with both "*questions and answers*" (Onn). Such relationships according to Onn had led to his undergraduate students having an inability to take charge of their own learning process in the university:

I tell you, some of my students get angry at me when I say to them, 'You want examination questions, so we give you past year question papers'. However, they also want answers to the examination questions. I said to them, 'You find the answers yourself. I won't give you the answers'. (Onn, an academic writing teacher)

Similar to Onn, a final year undergraduate university student (Cheng) associated his school learning with a spoon-fed approach (the opposite of the independent learning approach practised in the university):

University and school learning are different...Learning in the university requires you to be more independent...You can't depend on the lecture to give you the notes and everything, and then you just study the notes. That is what you get in school. But in the university, teachers just guide us, and then we need to do everything else by ourselves...In the school, teachers will give you information directly... They do not guide, they just give...The university want us to be independent. (Cheng, a final year undergraduate student)

Chan too was shocked when the same learning approach did not give him good academic results during his first year. This motivated him to develop a new learning approach that later helped him to attain better results. Similarly, another undergraduate university student (Razak), reflected during his school learning that he managed to get good results although he only learned in the classroom. However, the same approach no longer worked for his university learning when he found out that he could not answer his mid-term and final examination well if he just depended on information that he received in his classroom learning, as he shares below:

Yes, there is a difference between learning in school and the university. For example, in school, we only learn in our classroom. In the university, we learn in lectures, and then outside the lectures, we search for information on our own. Then we consult our teachers to see whether we have done the correct thing. At school, we did consult our teachers, but only a few times... But in the university, our lecturers only teach a little, but so many things are included in the exam. Our lecturers say that if we want to be able to answer our exam questions, we need to read and search for information on our own. So we have to follow a new format of learning; for one hour of lecture, we need to conduct two hours of independent study. (Razak, a final year undergraduate student)

A university teacher (Wani) also said that the goal of school learning that was focused on information collection and memorization interfered with the university students' engagement in the learning activity. Following a similar goal, Wani experienced that some of her Malay students preferred to keep their information and its sources to themselves. On the contrary, Wani's Chinese students shared any information that they had accessed with each other; resulting in a pool of information and information sources that were available for the students to choose from and later collaboratively use to

construct, articulate and reflect their understandings. In this respect, in addition to learning independently from classroom teachers, the learning activity further required students to learn collaboratively.

Finally, the postgraduate university students reported that the undergraduate learning experience also facilitated their engagement in information activities. Postgraduate students (Jannah and Maya) observed that their classmates who had studied abroad had a lot of experience and information to share and use while developing, articulating and reflecting their learning. In addition to information given by the classroom teachers, Jannah and Maya found that experience and information were useful to reflect their understanding in a different way than they had originally constructed.

Work experience

Emerging in my data analysis was the importance of work experience in facilitating the university students' engagement in the activity of student learning with information. For example, first year postgraduate students (Naim and Nori) said that their work experience had helped them to identify a topic of learning that was needed in their area of study just before they began their postgraduate study. This had enabled them to proceed to the next steps of the learning activity faster in comparison to those students who were yet to identify their topic of learning. In this respect Nori observed that, although the librarians had exposed her research methods class to various information sources that were potentially useful for the development of a research proposal, unlike her, some of her classmates had not accessed and used the sources yet as they were still undecided about their topic of learning. Nora's observation was supported by a postgraduate student with no work experience, Wina, who had spent a lot of time identifying her topic of inquiry since her first semester. However to her disappointment, her supervisor rejected the topic because it was too common. By the end of her second semester she was assigned a new learning topic by her supervisors, which required her to spend more time developing a new research proposal to suit the new topic of learning.

A university teacher (Nora) also observed that work experience that involved critical thinking and decision making would help the university postgraduate students to develop, articulate, communicate and reflect a critical understanding. Nora's view was

supported by first year postgraduate students, Naim and Nori, who said that their previous work experience that dealt with researching current religious issues in Malaysian context had prepared them well for the learning activity employed in their postgraduate classroom learning. As a result, Nori said that, unlike fresh postgraduate students who just "*kept quiet*" during the classes because they were "*still in shock*" at the active learning approach employed in postgraduate classes, postgraduate students with work experience participated actively and voluntarily during classroom learning. In addition to their classroom learning, the postgraduate students with work experience (Jannah, Maya, Naim and Nori) also articulated and reflected their understandings with classroom peers who shared similar working experience because as Nori said, that "*it was so much easier*" to discuss their ideas with peers who shared similar backgrounds and work experience.

On the other hand, since Nori had worked for almost twelve years before pursuing her postgraduate study, she was one of the senior students in her classes. Accordingly fresh postgraduate students in her classes respected her as their senior, which made it easier for her to obtain their assistance in searching and retrieving information from electronic and online sources. On the contrary, a fresh postgraduate student without working experience (Wina) found that work experience had created a barrier between her and her classroom peers who had a lot of work experience. Specifically, Wina found that due to her inexperience, her classroom peers often undermined her ideas without giving her a fair opportunity to articulate and reflect on the ideas. As a result, Wina articulated her ideas with her classroom teachers during classroom learning in order to gain an open, transparent, systematic, and fair reflection of the ideas. As well as this, she stood up to her classroom peers or discussed her topic of learning with her best friends who studied in a different public university.

9.7 Experiencing Personal Emotions

My data indicated that the university teachers, librarians and students experienced multiple emotions during their engagement in the activity of student learning with information which, to some extent, had further influenced their engagement in the learning activity. As discussed below, the emotions identified in the data analysis consisted of respect, appreciation and trust; passion and ego; patience and irritation; and boredom, frustration and hardship.

Respect, appreciation and trust towards each other

The data analysis showed that respect for each other's expertise had underpinned the implementation and continuation of student information skills programmes. All the university teachers agreed that the university librarians have knowledge, skills and experience in exposing the university students to access and retrieval information from multiple sources, particularly electronic and online. After working together for more than three years, university teachers (Onn and Sam) experienced a deep sense of respect and appreciation towards the university librarians for their kind efforts in developing and implementing structured student information skills programmes and spending countless hours exposing hundreds of their students to various information sources available in the library or on the Internet and the way to search and retrieve information from the sources. Out of their respect and appreciation toward the librarians' expertise and commitment, Onn trusted the librarians to solely handle the content and approach of the programmes.

University librarians, Azi and Mia, had the experience that students' respect and appreciation for their expertise and commitment often occurred at a later stage; usually after they have managed to help the students to access and retrieve certain information that the students required. In this light, Mia said that, although "*10 students scolded*" her in one day, but "*one student was happy*" with her assistance, she felt good about her work that day. Mia and Azi also associated students' appreciation toward their work as "*an instant reward*" for their efforts and a good indicator for their work, and more importantly motivated them to provide even better assistance to students.

A final year postgraduate student (Wina) supported the university librarians' perception as someone who appreciated the librarians' expertise during her final year when she joined an information skills programme for the first time. Retrospectively, she regretted that she did not approach and consult the university librarians earlier in her study. She confessed that she had made a mistake by thinking that she knew everything about the library collection and also the ways to search and retrieve information and its sources from the collection. Wina's situation supported Azi and Mia's experience that without the university students' respect for the university librarians, there would be no student–librarian interaction, or such interaction would be less productive in helping students to identify, articulate and refine their information needs; revise their search strategies; and

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retrieve information and its sources relevant to their topic of learning. Accordingly, the university librarians stressed the role of the university teachers as a bridge or link to student–librarian interaction within the university.

Being passionate in what you do

My data showed that being passionate educators, the university teachers pushed all the way to engage students in learning activities. These teachers collaborated with the university librarians to conduct information skills programmes for their students, as well as designing and implementing classroom learning based on formative assessment which ended with them spending more time grading the students' assignments. These passionate educators also went 'the extra mile' to train students to better engage in the learning activity. For example, when a university teacher (Onn) found that some students were unwilling to contribute and share ideas during classroom learning, he employed various strategies to engage these students. Among other things, Onn highlighted the importance of classroom interaction during his classroom learning, posing a lot of questions for students to answer during his lectures and tutorials, refusing answers for past-year examination questions to students, and using 'psychological' persuasion to ultimately engage students in the articulation and communication of their ideas or understandings during classroom learning. Additionally, another university teacher, Wani, spent a lot of her time outside the classroom to train students to use information critically and to independently develop, articulate and reflect their understanding and its construction because she was passionate about producing students who would satisfy the requirements of the university and national education framework.

The university students also experienced that being passionate about the activity of learning with information motivated them to engage further in every step of the learning activity. A first year postgraduate student (Joe) reported that he was enthusiastic about his engagement in the learning activity because he was able to construct his own understanding actively and independently from classroom teachers. Instead of waiting and listening to lectures, the learning activity gave him personal freedom and satisfaction in constructing, articulating and reflecting his own understanding collaboratively with the existing literature, and classroom teachers and peers. Although the learning activity required students to spend a lot of time, energy and focus in

searching, retrieving, reading, analyzing and synthesizing information from multiple sources to construct, articulate and reflect an understanding, other postgraduate students (Naim and Nori) went through all the steps because they were passionate about the outcome of the learning activity; i.e., mastering their topic of learning.

Maintaining personal ego

The data analysis indicated that maintaining personal ego was among the personal contexts that influenced the university students' engagement in the activity of learning with information. Mature postgraduate students (Nori and Wina) prepared well prior to their classroom learning by independently searching, retrieving, reading, analyzing and synthesizing information from multiple sources to successfully construct, articulate and defend their understanding during the classroom learning in order to both prevent a personal embarrassment and get personal "*exposure*" or recognition from the classroom teachers and peers.

Moreover, in order to "*maintain her self-esteem*" as one of the inexperienced postgraduate students at the department who always being looked down by her peers with work experience, Wina also chose not to discuss her topic of learning with her supervisor although the topic was assigned by the supervisor on the last minute. Accordingly, it was important for Wina to independently search and use information from multiple sources including practitioners to construct her understanding of the topic and articulate this in a research proposal instead of discussing the topic with her supervisor and later be known as the student "*who asked too many questions*".

Similarly, Onn, a university teacher, thought that students' personal egos ultimately would push them to participate during the classroom learning, as he summarized:

> *I observed that not all students like to interact during my lectures. If you kept asking those students too often, they will feel embarrassed. So I just let them keep quiet during my lectures. But during my tutorials, the number of students is smaller. So I ask a lot of questions during my tutorials. Students who do not like to be interactive just kept quiet…However, at the end of the tutorial, these students volunteered to answer my questions. They felt embarrassed because they were the only ones who had not answered my questions, so at the end, they volunteered to answer my questions. (Onn, an academic writing teacher)*

However, if teachers were not careful, they could do damage to students' personal egos which would lead to the students' ultimate disengagement from the learning activity. Onn observed that some teachers in the university would harshly scold students in front

of the class whenever the students did not perform or complete the learning activity. On a similar note, a final year postgraduate student (Wina) reported that two of her male classroom peers dropped one of their papers because their classroom teacher harshly and openly criticized their work in front of the class. When asked why, Wina said that one of the students told her that he was not used to this kind of approach, and thus decided to re-enrol in the subject in the following semester after he had "*cooled down*".

Irritation and patience

My data indicated that both irritation and patience were two feelings that were closely related to the university teachers' and librarians' engagement in the activity of student learning with information. On one occasion, a teacher (Wani) remembered that she felt very irritated when she noticed that one of her students had missed her lectures on the strategies of preparing and presenting a research proposal. The feeling increased when the same student later presented his research proposal badly. As a result, she scolded the student immediately after his presentation in front of the class for firstly not coming to her lecture and secondly ignoring tips that she had discussed in the lecture. Later she found out that this event had served as a warning for other students to refine their presentation accordingly.

On the other hand, the university librarians (Azi and Mia) felt irritated with the attitudes of some postgraduate students who undermined librarians' expertise and skills in searching and retrieving information from multiple sources. Unlike the university teachers, Azi and Mia kept the feeling to themselves and were patient with these students because they were concerned that, by expressing their true feelings to students, they would widen the gap between the university students and the librarians. Azi believed that by being patient, the university librarians could handle students who came from different backgrounds and who had different information needs. She said that although not all students appreciated the librarians' efforts at the beginning of their interaction, usually most of them changed their attitudes after the librarians managed to solve their information problems. Occasionally Mia would assert her expertise, academic qualifications, and experience to students during their interaction in order to increase the level of students' confidence and expectation towards her, which would ultimately lead to a more productive result.

Boredom, frustration, and difficulty

My data analysis also indicated that the university students experienced feelings of boredom, dislike, frustration, and hardship during their engagement in the activity of learning with information. Due to a lack of meaningful interaction between the university librarians and students to engage the students in the information skills programmes, second year undergraduate students (Amy, Kay and Kam) and final year students (Cheng and Razak) confessed that, at a certain point of time during the programmes, they felt bored and lost their concentration. Accordingly, Cheng and Razak believed it was their discussion with the librarians and peers *after* the programme that helped them to acquire and apply the necessary skills relating to information search and retrieval while completing their information skills assignments. However, Amy, Kay and Kam did not have the same opportunity because they enrolled in an information skills programme that did not have an information skills assignment. Respectively, although they were exposed to tools and strategies related to information search and retrieval, Amy, Kay and Kam did not employ the tools and strategies during their learning activity; indicated by their heavy use of personal blogs in their classroom assignments.

The university students also spoke of their frustration while engaging in the learning activity. A final year postgraduate student, Wina, associated her participation in information activities with a few frustrations. Firstly, she was frustrated when her supervisor assigned her a new topic of at the last minute when she had spent a lot of her time preparing for a research proposal on a different topic. However, when asked whether she discussed the problem with her supervisor, Wina said that she did not show her working research proposal to her supervisor because she did not want to make a big fuss about it. Secondly, after she attended an information skills programme which was integrated within one of her classrooms, she also felt frustrated because her department did not make any efforts to introduce such programmes to postgraduate students at the department level. Asked later why did she not approach the university librarians on her own early in her study, Wani said that it was during the programme she realized that she had overestimated her knowledge on information search and retrieval of the university library collection.

Finally, the university students described their engagement in several steps of the learning activity with difficulties. For example a final postgraduate student, Wina faced difficulty in preparing a literature review for her project paper because she needed to read a lot of journal articles before she was able to develop her own understanding of her topic. Likewise, final year undergraduate students (Feza and Fazil) also faced difficulty in preparing their literature reviews. However, they associated the difficulty with the process of "*extracting*" relevant information from different journal articles, and later "*weaving*" or articulating the extracted information into a coherent and systematic understanding. However, with the guidance of a librarian (Azi) who shared a few tips that she had used when writing a literature review for her own thesis, they slowly learned the ways to use and weave multiple, isolated and contrary information related to their topic of inquiry into a personal and systematic understanding of their own.

9.8 Pursuing Personal Preference

Lastly, analysis of the study data indicated that personal preferences of the university teachers and students influenced the types of information sources used by students in the activity of learning with information. One university teacher (Nora) believed that teacher preferences for certain types of information sources would influence students to use the sources during their classroom learning. Following her belief that online databases subscribed to by the university provided recent and scholarly information sources for postgraduate students to complete the learning activity, Nora required the students to use these sources for their classroom assignments and enrolled them in an information skills course that exposed them to how to search and retrieve these sources from the university library collection. Moreover Nora boasted of her students' motivation to use these sources during their classroom learning by saying that:

> *'You pay thousands of ringgit every semester for your fees, and the university paid millions of dollars to subscribe these online journals. Millions of ringgit has been spent by the university! It is your loss if you don't use them. You paid your [tuition] fees, but you just access information sources at the faculty's resource centre. You actually deserve to use the university's facilities'. I always say that to my students. (Nora, an information technology teacher)*

The importance of the university teachers' preference in influencing the university students' engagement in learning was confirmed by undergraduate university students (Cheng and Razak) who used textbooks and information on the Internet for their classroom assignments during their first and second years as required by their classroom teachers. Later, during their final year, they used articles from online and scholarly

journals accessible from the university library after they were instructed to do by their classroom teachers. On the other hand, postgraduate students (Joe and Naim) and undergraduate students (Cheng and Razak) preferred to access and use online information sources because these sources offered recent information about their topic of learning, as well as being conveniently accessible from their homes and residential colleges. However, Naim and another postgraduate student, Nori, cautioned that information available on the university library online databases and Internet was insufficient on its own to assist students to construct, articulate and reflect their understanding. Accordingly Naim and Nori primarily used printed, original and well known sources in their knowledge discipline and added the online sources whenever applicable. On the other hand, postgraduate students (Jannah and Maya) preferred to read and use printed books to develop, articulate and reflect their understanding because they could get the books easily from the university library and did not like to sit in front of a computer and spend their time searching for information on the Internet.

9.9 Aging with Wisdom

A university teacher, Onn, viewed that teachers from different age groups engaged differently in the activity of student learning with information. During his appointment as an internal auditor for classroom learning at his department, Onn observed senior university teachers were relatively more relaxed in facilitating students' engagement in the learning activity in comparison to young teachers who had just completed their PhD study. The young teachers were often focused on students' attainment of the learning activity outcomes, and thus easily frustrated by the students' lack of attainment. Accordingly, Onn said it was often these teachers who resorted to non-deliberate and yet public attempts at ridiculing the students' knowledge and efforts.

On the contrary, as a senior teacher in his department, Onn did not take out his disappointment on students who were unwilling to participate during his lectures. Instead Onn patiently engaged the students in the classroom learning during his tutorial classes. With a small number of students and a lot of questions posed by Onn during the tutorial classes, the students finally and voluntarily shared their ideas with their classmates after they realized that they were the only students who did not contribute to the classes and they felt embarrassed about that. Furthermore, Onn was not only interested in the students' attainment of the learning activity's outcomes, but further contextualized the attainment process to a local situation. For example, in order for

students to collaboratively search and use information to develop and articulate an understanding, Onn assigned students to work within a group that comprised Malay, Chinese and Indian students as his way to support the national aspiration: the cultivation of a harmonious inter-racial relationship between multiple local ethnicities in Malaysia. These findings suggested that senior university teachers view university learning as a tool that helps them to develop and attain goals beyond the personal level, such as goals at national or society levels. As shown by Onn, the development and attainment of these goals would indirectly inform the planning and implementation of the activity of student learning with information.

The university students also experienced that students from different age groups engaged differently in the learning activity. A mature postgraduate student who has a lot of work experience (Nori) had worked with two study groups in order to complete her learning activity. The first group comprised young postgraduate students who had just finished their undergraduate study and the second group had mature students with a lot of work experience. Because the young student group was very "*good and fast*" in using computer and online application, Nori sought help from the group to search and retrieve electronic or online information that she needed to complete her learning activity. Nora confessed that coming from an older generation; she was less exposed to various online application and skills in comparison to her young classmates. On the other hand, mature students were very good at using information to develop, articulate and justify an understanding. Accordingly, Nori worked with the mature student group to reflect her understanding which had enabled her to refine it. The findings indicated that work and life experiences had helped mature students to acquire sufficient wisdom and confidence to work with people from different backgrounds that facilitated their completion of the activity of learning with information.

Nori and another postgraduate student, Naim, also observed that mature postgraduate students participated more actively in the learning activity in comparison to young postgraduate students. Both of them attributed the situation to the lack of experience of young postgraduate students in student-centred learning, For example, Nori observed that her fresh classmates were still in shock with the interactive mode of learning often employed in postgraduate classrooms which differed significantly from their undergraduate classroom learning. Instead of "*waiting for teachers to present*

information to students", Nori said that postgraduate classroom learning required students to prepare well prior to the classes that had become the platform for postgraduate students to articulate and defend their personal understanding publicly with classroom teachers and peers. Naim and Nori further noted that fresh postgraduate students primarily used personal blogs, or reviewed or translated books to construct and articulate their understandings. On the contrary, mature postgraduate students used original and authentic books and institutional websites as well as seeking advice from experts in their field of study for their learning activity which introduced a breadth and depth to their learning topic. However, such advantages were missing from personal blogs, or translated and reviewed books because these secondary sources no longer held the original meaning intended by the original authors as the meaning had been re-interpreted by the blog developers, book translators and reviewers.

In retrospect, due to the lack of breadth and depth of their classroom learning topics, Nori found it was no surprise that fresh postgraduate students "*just kept quiet in the classes*" and were unwilling to share their ideas during classroom learning. Postgraduate students with work experience (Jannah and Maya) said that they did not have a chance to "*get to know*" (Jannah) or "*mix*" (Maya) with young students in their classes because the students did not participate during their classroom learning. The fact that young students always sat at the back of the classes also did not help Jannah and Maya, who always sat in the first row of their classes, to interact with the fresh students during classroom learning. Being young and inexperienced, young students in the study lack wisdom and confidence to mingle and work collaboratively with individuals from different backgrounds. The findings indicated that young postgraduate students without work experience may require extra assistance from classroom teachers to expose them to the activity of student learning with information, particularly in the areas of constructing, articulating and reflecting their understanding and the understanding construction process. If classroom learning is uncontrolled, mature postgraduate students may dominate this area of learning, creating an imbalance in opportunities for young and fresh students to engage in the activity at the classroom level.

The data analysis also indicated that young students were more focused on the production of mediating artifacts for their learning activity instead of developing mediating artifacts for their understanding and its construction. The findings suggested

that young undergraduate students were more focused on the outcomes and less focused on the process of learning with information, indicating that they have different goals related to student learning with information, and thus use different strategies to attain the goals. For example second year undergraduate students (Amy, Kam and Kay) focused on submitting well-written term papers instead of using the paper to articulate their understanding and the construction of the understanding. Accordingly in order to attain a good grade they copied writings from personal blogs and used them in their term papers because the writings were better than their own writing. On the contrary mature postgraduate students (e.g. Nori and Naim) engaged in every step of the learning activity because they wanted to become expert in their learning topics and to avoid personal embarrassment during their classroom presentations and discussions. The findings indicated that, in relation to mature postgraduate students, young undergraduate and postgraduate students focused more on the outcome and less on the meaning of the activity of learning with information; this is indicated by their focus on the grade and not on the development of new understandings.

9.10 Ethnic Differences

Although one university teacher (Ana) did not think that students' ethnicity had anything to do with students' engagement in the activity of learning with information, my data indicated the reverse. For example, a university teacher (Wani) observed that, in general, her Malay students had poor class attendance in comparison to Chinese students. Due to the lack of attendance, Wani further experienced that the Malay students often missed key elements of their classroom topics that she highlighted and explained during her lectures. Specifically, Wani perceived the Malay students missed valuable opportunities to learn from their teachers' experience and knowledge which is the result of teacher–student interactions during classroom learning. Accordingly Wani said when the Malay students missed both the elements and opportunity; their engagement in the learning activity was less effective compared to their Chinese classmates.

Similarly the university librarians reported that during the completion of classroom and information skills assignments, a higher number of Chinese undergraduate students used information sources and consulted the librarians on their information search and retrieval compared to Malay students. A librarian (Mia) explained her experiences

dealing with Chinese and Malay undergraduate students while working at the library helpdesk in the excerpt below:

> *When we sit at the help desk early in the semester, some lecturers come to us and ask us to help their students with their classroom assignments. In the next few days, we would see and consult Chinese students who would search for the information sources. After a week or two, Malay students would come and ask us for help. Sometimes, the books that they want have already been borrowed. I ask them, 'I have been helping other students with this topic for quite some time, but why did you just come today?' ... The normal answer given to me is, 'We don't have time, the [assignment's] deadline is this week' ... They come only at the last minute. What a pity! (Mia, a librarian)*

A university teacher (Onn) supported the librarians' experience by saying that although his undergraduate Malay and Chinese students had similar abilities in analyzing and synthesizing information, his Chinese students were generally more diligent in accessing information, as well as validating their understanding with classroom teachers outside the classroom learning. In relation to this, a teacher (Wani) and a Malay undergraduate student (Razak) noticed that Chinese students were more focused and persistent in completing their learning activity. Razak stated that his experience indicated that even one Chinese student was enough to "push" a group of Malay students to complete their assignments sooner than was usual, as he explained below:

> *If we have a group which consists of only Malay students, we tend to do our work slowly…If we have Chinese students as members, even just one Chinese student; it is enough for the group to complete the assignment faster. This is because Chinese students like to push everybody to work faster….When all the members of our group are Malay, we always say to each other, 'Could we meet later?' And the next thing, the meeting will just be cancelled...Indian students are also similar to the Chinese students. Ha! [that's why], we sometimes prefer a mixed group and not all Malay students. (Razak, a final year undergraduate student)*

However, an Indian final year undergraduate student, Kan suggested that the phenomenon that was described by Razak might occur within any ethnic group. In her case, Kan abandoned her Indian study group during her second year after she received cynical remarks from the members regarding her efforts in completing her classroom assignments and revising her classroom topics on time. Although Kan loved to be part of the group because there are not many Indian students studying in the university, she finally decided to be on her own because the group members did not share her goal, that was to excel in her study, and they undermined her efforts to achieve that goal.

Students from different ethnic groups also developed different relationships with information sources. A Malay undergraduate student (Razak) and a Malay teacher (Wani) observed that Malay students liked to "*hide*" information and its sources such as classroom notes and past year examination questions from other students. On the contrary, Razak observed that Chinese students not only "*share all the information they found with other Chinese students*" but also "*make copies of the information*" for other Chinese students. Similarly, while Malay students generally preferred to search, retrieve and use information and its sources individually, Chinese students generally preferred to perform the activities collectively which allowed them to collaboratively share, discuss, analyze and synthesize information to develop, refine and reflect a collective understanding.

This observation was in line with university teachers' (Wani and Onn) experience that suggested interactions between Malay undergraduate students and their classroom teachers and peers were less in comparison to Chinese undergraduate students. Wani also reported that her undergraduate Malay students had commented that their lack of interaction or participation during classroom learning was not an indication of their understanding and supported their comment with a Malay proverb, 'D*iam-diam ubi berisi'* (tubers growing quietly), equivalent to the proverb 'Silence is golden'. Alternatively, Onn associated his Malay students' lack of verbal interaction with their preference of using "*a lot of body language*" (Onn). A mature postgraduate student (Nori) added another dimension concerning Malay culture that she considered had also influenced young postgraduate students' interaction during their classroom learning, that is, respect for elders, as she pointed out below:

> *The young and fresh students feel that we are their seniors because we are already 30 plus years old and they address us as their older sisters and brothers. So they do not want to talk during our classes because we want to talk…They even greet and talk to us with so much respect! (Laughing) So they bring this respect inside the classroom and think, 'They are older, so we don't want to talk too much'. I think that is what the fresh students were thinking. (Nori, a first year postgraduate student)*

The findings suggested to some extent that culture plays a role in shaping the learning strategies of undergraduate and young postgraduate students in their quest to complete the activity of student learning with information. While Malay students in general engaged in the learning activity at their own learning pace, Chinese students aimed to complete the learning activity as soon as possible. Additionally, while Malay students

generally employed individual learning approaches, Chinese students used a collaborative learning approach to complete the learning activity. Malay and Chinese students also used different strategies to construct, articulate and reflect their knowledge due to their differences in communication styles. For example, while Malay students preferred to work quietly and on their own, Chinese students preferred to consult classroom teachers and librarians outside their classroom to articulate, reflect and refine their understanding. My data also showed that some undergraduate Malay students and all mature Malay postgraduate students did not fit the above categorization, thus indicating that culture is not the ultimate estimator for students' engagement in the activity of learning with information. While my data suggested that cultural differences appeared in the activity of student learning with information, this study is neither a study of culture, nor does it assume anything about culture, but it acknowledges that different cultural contexts to some extent interplay in the activity of student learning with information.

9.11 Gender Differences

My data analysis also suggested that students of different genders created and used different styles of interaction while engaging in the activity of learning with information. A teacher (Sam) observed that, in comparison to female undergraduate students, male undergraduate students were *"generally lazy, non-responsive, non-active"* during their classroom learning. On the other hand, a university teacher (Onn) said that he had to employ different persuasion styles to engage male and female students in the learning activity, trusting the male students and caring for the female students, as he explained below:

> *I say to my male students 'I trust you, you can do it in whatever way'...But for my female students, I tell them 'I like it if you get high marks'. For female students we need to say 'I like you', you do not say to them 'I trust you'. (Onn, an academic writing teacher)*

Similarly, the university students reported that male and female students employed different styles while engaging in the learning activity. For example, a female postgraduate student (Wina) observed that while her male classroom peers articulated and justified their ideas during classroom learning in a *"rational"* and *"direct"* way, her female classroom peers attached emotional dimensions to the articulation and reflection process. Likewise, another postgraduate student (Jannah) observed that the outstanding students in her classroom were male students who had the ability to negotiate their

understanding with their classroom teachers and peers in a "*brave*" and "*cool*" way, as Jannah explains:

> *Students who have different views from our classroom teacher must be ready with evidences and rationale...Female students often do not argue with the teacher; it's usually the male students who do that...Female students are often not brave enough to argue with the teacher because he is very critical…It is better for us to listen than to break down and cry (laughing)..The teachers would ask us everything and spare nothing… until we don't know what else to say. Sometimes, when we say something, we mean it in a certain way, but he will see it in a different way. At the time, we didn't think about those aspects...When he interrogated us on those aspects, we just went blank...But male students are cooler. (Jannah, a first year postgraduate student)*

However, being rational, direct, brave, or cool might not be the only factors that assist male students to better articulate and justify their personal understanding during classroom learning. My data analysis also showed that male students used certain strategies to complete their learning activity. For example, a female postgraduate student (Wina) found that some of her male classmates preferred to simplify the learning activity by delegating certain tasks to other students. For example, instead of searching for information and its sources from scratch, her male classroom peers requested the information and its sources from Wina, who had completed the activity ahead of time.

Female postgraduate students (Jannah, Maya) also observed that in addition to original books in their knowledge discipline, their male classroom peers searched and used current and authentic online information resources to support their arguments during classroom presentation and discussion. Such activities require male students to use computers for a long period of time, which female students on the general could not afford to do, as related by Jannah and Maya below:

> *Male students surf a lot of internet websites…They read a lot of websites that have authority in our discipline and get all the latest views and rulings related to our classroom topics. Female students do not really engage with internet, we only look it up when certain issues arise...Women don't really like to sit in front of computers; we need to take care of our children...So instead of surfing on the internet, we would think it is better to cook, wash or mop (laughing)...Male students can surf the internet even at midnight; they don't need to take care of the baby! (Jannah, a first year postgraduate student)*

> *Yes! Male students only surf the Internet and use authentic or original books that they already have for the subjects. Unlike us, they do not go to the library. (Maya, a first year postgraduate student)*

Naim, one of the outstanding male postgraduate students that Jannah and Maya had described earlier, corroborated Maya's and Jannah's view. Naim only searched, read, and used information from primary and authentic information sources, such as original books and authoritative websites in his knowledge discipline in his classroom assignments and presentations. Naim further contacted experts in his knowledge discipline prior his classroom learning to validate his understanding and the construction of this. However, Naim highlighted that he was able to use and contact the sources and experts due to his mastery of the Arabic language in which the experts' books were published.

Finally, although most the university students were of the view that their male counterparts participated better in certain tasks of the learning activity, a female postgraduate student (Wina) suggested that due to a high tolerance toward stress, female students were more likely to complete their learning activity in comparison to male students. As Wina's experience shows:

> *Some of my classmates did not do well. Our teacher said to us, 'If this is the kind of work that you produce, my children can do this too!' He didn't say that directly to the student, but to the whole class. We were all stunned! What a statement! At first, we felt stressed in his class. Some students took the criticism personally. However, we need to be open-minded about the criticism One student dropped the class, and another dropped his studies for the whole semester...He said he needed to cool down first, he was not used to this kind of approach...Both of them were male. (Wina, a final year postgraduate student)*

As with culture, the data analysis indicated that, to some extent, gender differences influenced student engagement in the activity of learning of information skills.

9.12 Summary

This chapter discussed findings of the study that revealed the university teachers, librarians and students experienced and perceived their engagement in the activity of student learning with information was influenced by their personal contexts. My data analysis showed that these personal contexts comprised of personal assumptions, goals, efforts, skills, experiences, emotions, preferences, ages, cultural backgrounds and genders of university teachers, librarians, and students who engaged in student learning with information. In addition to the interpersonal and social contexts of those engaged in the student learning, discussed in previous chapters, the findings indicated that personal contexts also influenced student learning of information skills. It emerged from

the study that student learning with information in higher education is a dynamic and complex process, as discussed in the following, concluding, chapter.

CHAPTER TEN: SUMMARY, CONCLUSION, IMPLICATIONS AND FUTURE RESEARCH

10.1	Overview
10.2	Summary of the Study
10.3	Conclusion of the Study
10.4	Implication of the Study
10.5	Limitation of the Study
10.6	My growth as a researcher
10.7	Future Research

10.1 Overview

In this chapter I first provide a brief summary of this study and revisit the original conceptual framework that guided this study. I then present the revised framework for student learning of information skills that answered my research questions concerning the features of student learning of information skills and the interplay of social, interpersonal and personal factors in that student learning. I also summarize the ways my key findings confirmed and extended the literature on the student learning of information skills and, based on the key findings, provide a few recommendations for the study and practice of student learning with information. This chapter closes with a discussion of the limitations of the study, and recommendations for future studies.

10.2 Summary of the Study

While there are a lot of studies on student learning of information skills in higher education, there is still a lack of empirical studies that explain how the student learning takes place across multiple communities (i.e., communities of higher education teachers, librarians and students) in that area. Using the perspective of communities of practice as the theoretical framework, my purpose with this study was to enhance understanding about student learning of information skills in higher education by examining the experience and perception of university teachers, librarians and students involved in student information skills programmes. The study was based on the premise that the student learning could be better understood if it was viewed using the multiple perspectives of those actually engaged in the student learning.

Five research questions were developed in the study to determine if new insights were gained when student learning of information skills was explored as a collective engagement of university teachers, librarians and students in student information skills programmes. The research questions are as follows:

1. How do Malaysian university teachers, librarians and students who engaged in student information skills programmes experience and perceive student learning of information skills?

2. What is the immediate context for student learning of information skills as experienced and perceived by the university teachers, librarians and students?

3. How do the university teachers, librarians and students experience and perceive the interplay of interpersonal factors in student learning of information skills?

4. How do the university teachers, librarians and students experience and perceive the interplay of social factors in student learning of information skills?

5. How do the university teachers, librarians and students experience and perceive the interplay of personal factors in student learning of information skills?

Following the perspective of communities of practice (Wenger, 1998) I began my study with a few initial assumptions about student learning of information skills in higher education that had informed the study design and data-collection methods. The initial assumptions were:

a. That student learning was about students mastering a predetermined set of information-related skills;

b. That student learning was located within the community of student learning of information skills which theoretically developed informally as teachers, librarians and students engaged in student information skills programmes;

c. That student learning was a social process of student participation in the pillars of the community of student learning of information skills—joint enterprise, sharing repertoires, and mutual engagement, aided by expert members of the community: teachers and librarians;

d. That student learning involved a progressive movement of student legitimate participation from peripheral to full participation, and student mastery of information-related skills from novice to expert within the community of student learning of information skills; and

e. That, given that university teachers, librarians and students were both unique individuals and members of multiple communities in higher education, the student learning could be influenced by multiple personal, interpersonal and social factors.

Following these initial assumptions, I identified that university teachers, librarians and students who participated in student information skill programmes were the 'units of analysis' in the study. Furthermore, due to the ability of qualitative studies to elicit personal experience and perception (Bogdan & Biklen, 2007; Crotty, 1998; Guba & Lincoln, 1994; Merriam, 2009; Patton, 2002) of the university teachers, librarians and students with regard to student learning of information skills, a qualitative approach was identified as appropriate for this study. The study was conducted in a public university in Malaysia that has a majority of Malay students. The university was one of the research universities in Malaysia and had a current intake of 14,357 undergraduates and 9,656 postgraduate students in multiple knowledge disciplines. During the data-collection process, I worked closely with a few librarians in the university to identify student information skills programmes that involved teachers, librarians and students.

Although the majority of participants in the study are Malay, following the requirements of purposive sampling and maximum variation of participants (Merriam, 2009), I identified and later observed, five student information skills programmes that were organized by the librarians and involved teachers and students from multiple departments, knowledge disciplines, and academic programmes. Based on my observations, I developed interview protocols for the study participants before using them to guide my semi-structured interviews with five teachers, four librarians and 22 students from the observed programmes who were willing to participate in the study. My study incorporated features of interpretivist or naturalistic study (Denzin & Lincoln, 2000, p. 3) that relied on my interpretation or making sense of my participants' actions, experiences and perceptions by analysing their actions and language that were recorded in my data sources: observation notes, interview transcripts and printed and softcopy documents related to student information skills programmes. During my data analysis, I suspended my initial assumptions about student learning of information skills and analysed the actions, experiences and perceptions of my participants relating to the student learning before developing themes that were grounded in the data and arranged according to my research questions. During the data-analysis process, I employed a recursive process of listening, transcribing, and reading my interview transcriptions,

observation notes and related documents in order to classify the content of these within three broad themes of student learning with information skills that reflected my three research questions, i.e., features of student learning of information skills, and social, interpersonal and personal factors that influenced the student learning. Later, I assigned descriptive and axial codes that give meaning and pattern to the emerging themes. Due to the quantity of data in the interview transcripts, I used the Nvivo program to help me organize data from the interview transcripts and codes that emerged from the data analysis.

Detailed findings from the data analysis were presented from Chapters Six to Nine that were arranged purposively to answer my research questions. Chapter Six answers the first research question and discussed features of the activity of student learning with information emerging from the data, while Chapter Seven answers the second and third research questions and discusses features of the classroom context that had emerged in the study as the immediate context for the activity of student learning with information to take place, and explained the interpersonal influencing contexts for the activity of student learning with information. Finally, Chapter Eight, and Nine explain the social, and personal influencing contexts for the activity of student learning with information respectively. I acknowledged that sometimes it was hard for me to separate my participants' experience and perception of student learning of information skills from their interpersonal, social and personal contexts that had somewhat influenced their experiences and perceptions. Although I had tried to my best to retain thick descriptions of their experience, perception and contexts, some of their richness might have been lost when they were presented separately in the Findings chapters.

This chapter is my synthesis of findings from Chapters Six to Nine. These have been organised into a social ecological model for understanding student learning with information in higher education. This model was a revision of my original theoretical framework discussed in Chapter Four which grew problematic in explaining emerging findings from my study that showed:

1) Student learning of information skills was about students engaged in the activity of student learning with information instead of the activity of students' learning of various information related-skills assumed at the beginning of my study.

2) The outcome of the activity of student learning with information was students' creation of new public knowledge and its mediating artefacts instead of students' acquisition of a set of predetermined information-related skills assumed at the beginning of my study.

3) Classroom learning was the immediate context for the activity of student learning with information instead of the community of student learning of information skills assumed at my study's beginning.

4) Via participating in the activity of student learning with information, students engaged in proximal processes of developing students into knowledge creators instead of the socialization process of becoming full members of the community of student learning of information skills that was initially assumed.

5) There were multiple influencing factors for students' participation in the activity of learning with information that were interrelated reciprocally and systematically with each other; suggesting that the proximal development processes operated within a nested or ecological learning system. In this sense, the findings were different from the original framework that assumed an independent interrelationship between personal, interpersonal and social influencing factors for student learning of information skills.

To explain the emerging findings, I revised my original framework to emphasize the above emerging findings. The revised framework was underpinned by works on the ecological model of human development (Brofenbrenner, 1994 (reprinted), 1995, 2005; Brofenbrenner & Morris, 2006; Darling, 2007; Tudge, Mokrova, Hatfield, & Karnik, 2009) and knowledge building (Paavola & Hakkarainen, 2005; Scardamalia & Bereiter, 2003). The revised framework extended Marcum's (2002) work that argued for information literacy to be viewed using an ecological perspective because, unlike computer information processes, "individuals do not receive signals [information] from the environment but reciprocally participate in its creation" (p. 5). With that in mind, I present the revised framework in the following section which was called 'the ecological processes for developing students into knowledge creators' and which highlighted the ecological learning system for developing students into knowledge workers; one that emphasizes the role of the activity of student learning with information, developing persons, and immediate and external contexts in the development processes.

10.3 Conclusion of the Study: The Ecological Processes for Developing Students into Knowledge Creators

Students searching and using information from multiple sources resembles individual students' efforts and everyday routine in higher classroom learning. However, my study showed that there were more to the efforts than merely individual students using their cognitive, psychological, biological and social resources to retrieve and use information and its sources. I found that these efforts were part of bigger processes, known in this study as ecological processes for developing students into knowledge creators. Figure 3 illustrates how the development processes operated within an ecological learning system and comprised four fundamental properties: the knowledge-building activity, personal contexts of the developing persons, an immediate context, and multiple levels of external contexts for the development processes which in turn influenced the form, content, direction and power of the development processes.

The knowledge-building activity

Central to the processes for developing students into knowledge creators was the activity of knowledge building. Located at the top of the processes in Figure 3, the activity comprised six subsequent stages that required students to identify the knowledge frontiers, access public knowledge and its sources, interact with sources of public knowledge, and use the public knowledge to construct, articulate and reflect new knowledge and its mediating artefacts. The multiple stages of the knowledge-building activity were found to be similar to the process approach of student learning of information skills that engaged students in a multi-stage authentic information problem-solving activity (Thomas, 2004).

Although the activity was presented in Figure 3 in six separate stages, in reality these stages run concurrently or in a close temporal sequence with each other—with each stage serving as a catalyst for the following stage. For example, students' identification of knowledge frontiers required them to access public knowledge from multiple sources (journals, books, research reports, etc) that were available in multiple forms (online, CD-ROM, hardcopy, etc). When students used the public knowledge that they had collected to inform their knowledge frontiers and refine the identified knowledge frontiers into a topic of inquiry, the students would be searching and using more specific public knowledge to construct their understanding on their topic of inquiry. To the same

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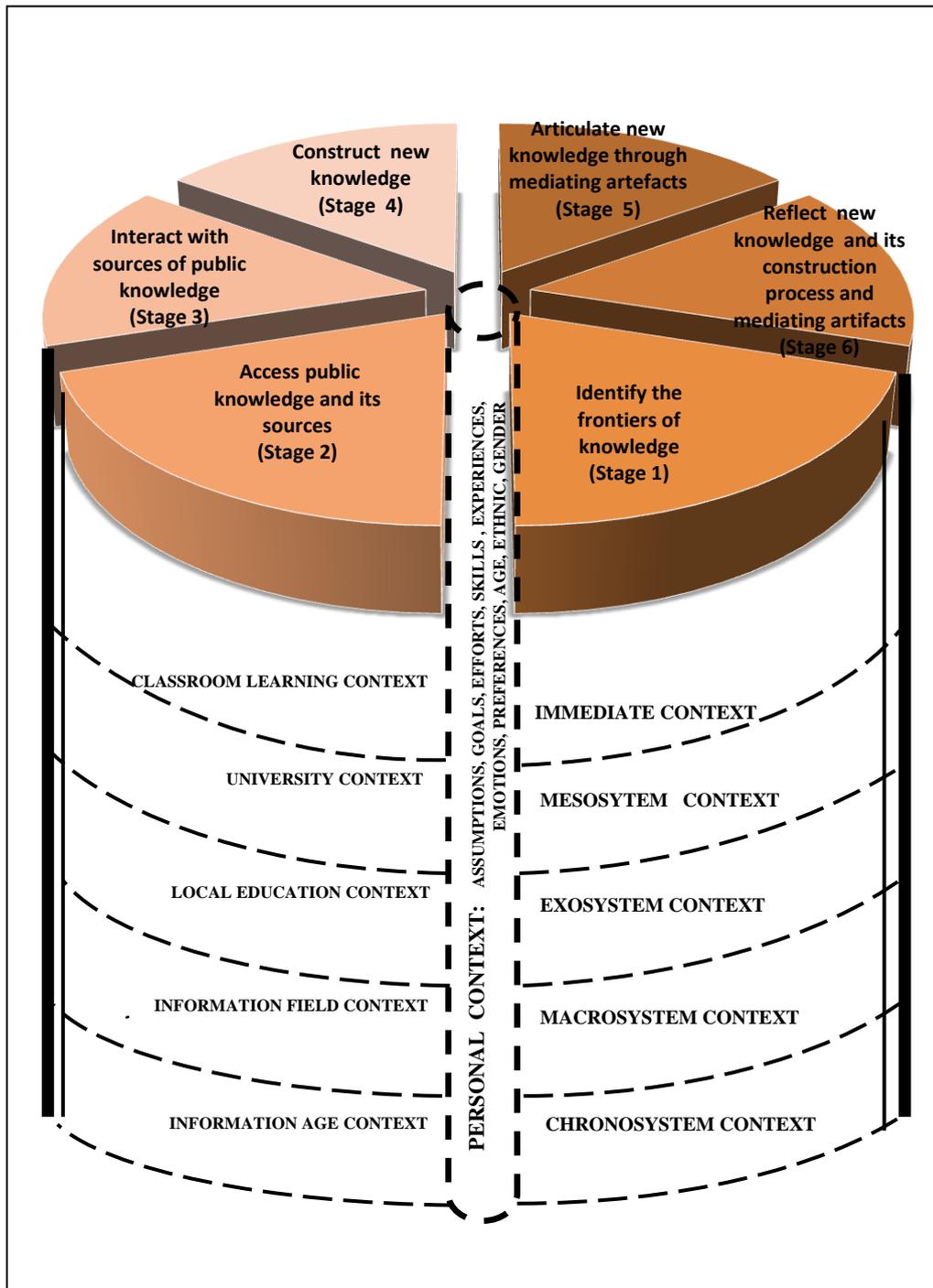
Figure 3: The ecological processes for developing students into knowledge creators. This model was underpinned by works on the ecological model of human development (Brofenbrenner, 1994 (reprinted), 1995, 2005; Brofenbrenner & Morris, 2006; Darling, 2007; Tudge, Mokrova, Hatfield, & Karnik, 2009) and knowledge building (Paavola & Hakkarainen, 2005; Scardamalia & Bereiter, 2003).

effect, insufficient students' identification of the knowledge frontier would lead to a weak identification of a topic of inquiry, resulting in ineffective student engagement in the subsequent stages of the activity of knowledge building. For example, the study showed that some students prolonged their disengagement from accessing sources of information when they had not yet identified the topic of their inquiry.

The findings followed the ecological theory of human development that argues, in order for any proximal developing processes to be successful, the process must engage the developing persons in "…processes of progressively more complex reciprocal interaction between active, evolving biopsychological human organism and the persons, objects, and symbols in its immediate external environment" (Brofenbrenner & Morris, 2006, p. 795). The findings agreed with existing literature that indicated student learning of information skills required students to engage and demonstrate multiple personal and social information-related thinking and behaviours and thinking processes that increasingly and gradually became complex when they moved from library and computer skills to critical and creative thinking skills, and communication skills (e.g., Association of College and Research Libraries, 2000; Bundy, 2004; Society of College National & University Libraries, 1999; Stripling & Pitts, 1988; Wijetunge & Singh, 2006). Through students' involvement in the subsequent stages of the knowledge-building activity, my study showed that they engaged in reciprocal and increasing complex processes of interaction with multiple primary persons (e.g., classroom teachers, peers, librarians, experts/practitioners), the students gradually interacted and participated progressively with complex objects (e.g., library, search engines, multiple sources of public knowledge), and symbols (e.g., multiple formats or styles for constructing, articulating, presenting and reflecting new knowledge and the construction of the knowledge).

The dynamic interrelationship between the multi-stages of the knowledge-building activity was also evident in student learning of information skills when Badger and Roberts (2005), and Hepworth and Wema (2006) found that students' inability to search information and its sources independently affected students' evaluation and use of information and its sources. The findings were also similar to existing literature that featured information skills learning as students performing multiple stages of an activity that were interrelated (e.g., Kuhlthau, 1994, 2004, 2008; Stripling & Pitts, 1988;

Wijetunge & Singh, 2006). The findings further supported the idea that student learning of information skills in higher education was about providing students with a learning activity that allowed them to continuously interact with, and reflect on, information (Bundy, 2004). This finding was similar to existing literature that advocated for a process approach for helping students to acquire multiple information-related skills which, among other aspects, required students to engage in a specific and designed learning activity to attain specific learning goals (e.g., Association of College and Research Libraries, 2000; C. Bruce, 2001b; Bundy, 1999, 2004; Harris & Millet, 2006; J. E. Herring, 1996; Irving, 1985; Kuhlthau, 1994, 2004, 2008; Larkin & Pines, 2005; Marland, 1981; Society of College National & University Libraries, 1999; Stripling & Pitts, 1988; Thomas, 2004; Wijetunge & Singh, 2006).

Despite close similarities between the stages of the activity of knowledge building and information skills learning, the study showed that the two activities had different goals. The goal for knowledge-building activity was to engage students in a deliberate process of advancing existing public knowledge that resulted in "the creation or modification of public knowledge – knowledge that lives 'in the world' and is available to [be] worked on and used by other people" (Scardamalia & Bereiter, 2003, p. 1370), while the goal of the information skills learning activity was to expose students to a set of identified information-related skills such as searching, evaluating, and using information from multiple sources (e.g., Association of College and Research Libraries, 2000; Herring, 1996; Irving, 1985; Marland, 1981; Society of College National & University Libraries, 1999). Following these goals, my study found that the activities had different outcomes. While the outcomes for knowledge-building activity were students' creation of new public knowledge or modification of existing knowledge in the forms of "new ideas, methods, theories, models, and so on" (Paavola & Hakkarainen, 2005, p. 542), the outcomes for the information skills learning activity was students' acquisition and mastery of the information-related skills (Association of College and Research Libraries, 2000; Bundy, 2004; Catts & Lau, 2008; Harris & Millet, 2006; Herring, 1996; Irving, 1985; Marcum, 2002; Marland, 1981; Society of College National & University Libraries, 1999), which hardly changed from the four outcomes that were identified earlier by Kuhlthau (1987) who stated that student learning of information skills would assist students to acquire and master the following knowledge and skills:

1) How information is identified and defined by experts;

2) How information sources are 'structures';

3) How information sources are intellectually accessed by users; and

4) How information sources are physically organized and accessed.

The identified gaps in the goals and outcomes for both activities supported previous studies that asserted student learning of information skills must go beyond the acquisition and mastery of the information-related skills themselves (e.g., Limberg, Alexandersson, & Lantz-Andersson, 2008; Sundin & Johannisson, 2005). My findings also supported the literature that criticized student learning of information skills as being too focused on information-processing skills, particularly information retrieval skills, while overlooking the process of learning or knowledge building that involves the process of transformation of information into knowledge or understanding (Marcum, 2002; Ward, 2006; Williams, 2001). My study also supported C. Bruce (1997) who found information literacy in higher education was a process of using information technology for information retrieval and communication, finding information located in information sources, controlling information, building up a personal knowledge base in a new area of interest, and working with knowledge and personal perspectives adopted in such a way that novel insights are gained, and using information wisely for the benefit of others. Likewise, the study supported Abilock (2004, p. 10) who stated that information literacy is a "transformational process in which the learner needs to find, understand, evaluate, and use information in various forms…for personal, social, or global purposes" (p. 10).

However, I found that it was dangerous to view the development processes of becoming knowledge creators as merely executing processes; that would reduce the development processes into internal, unobservable, intangible and personal processes. On the contrary, the study showed that the knowledge-building activity required students to engage in a continuum of learning processes that ranged from internal, individual and unobservable processes of knowledge construction to social processes of knowledge construction, articulation and reflection. This resulted in the development of new social knowledge and its mediating tangible artefacts which went through multiple dialogic processes with classroom teachers and peers and, to a certain extent, with long-distance peers, experts and practitioners. Emerging from the study was the role of a dialogic approach and mediating artifacts in supporting the development processes of transforming students into knowledge creators. In this light, the study supported the role

of dialogic approaches and mediating artefacts in knowledge-building processes (e.g., Limberg et al., 2008; Rojas-Drummond, Albarran, & Littleton, 2008; Sundin, 2008).

My study found that two stages of the knowledge-building activity—identifying the frontiers of knowledge and accessing public knowledge, were the most common stages shared by the university teachers, librarians and students as they engaged in student information skills programmes. At first, the findings seemed to support some of the literature that argued student learning of information skills in Malaysian higher education was focused heavily on information searching and information and communication technology application (e.g., Karelse, 1998; Reid, 1998). However, looking from the viewpoint of the ecological processes of developing students into knowledge creators, the goal and outcomes of student information skills programmes were identified as parts of the goals and outcomes of the knowledge-building activity. The development processes also indicated that the knowledge-building activity begins in the classroom context—the immediate context for the development processes to take place. While student information skills programmes support the first two stages of the knowledge-building activity; the remaining stages take place within the classroom context. Due to the limited time and stages of the knowledge-building activity that the student information skills programmes were offered to students, it was easy to see that the programmes, on their own, were unable to engage students in the knowledge-building activity that requires students to engage in an increasingly complex reciprocal students' interaction with primary persons (e.g., classroom teachers, peers, librarians, experts/practitioners), objects (e.g., library, search engines, multiple sources of public knowledge), and symbols (e.g., multiple format or styles for constructing, articulating, presenting and reflecting new knowledge and its mediating artefacts). In retrospect, while examining the programmes on their own shed some light on students' acquisition of information-related skills, the programmes alone were unable to explain the phenomenon of the knowledge-building activity and the development processes in becoming knowledge creators in higher education.

In the ecological theory of human development (Brofenbrenner, 1994 (reprinted), 1995, 2005; Brofenbrenner & Morris, 2006; Darling, 2007; Tudge, Mokrova, Hatfield, & Karnik, 2009), Bronfenbrenner stated that, in order for any development processes to become effective, the developing persons must engage in the processes over an

extended period of time on a fairly regular basis. Similarly, the study found that, for the development processes to become effective, the developing persons must engage in the developing activity over an extended period of time on a fairly regular basis. In other words, for development of students into knowledge creators to take place, students must engage in the knowledge-building activity on a regular basis within an extended period of time. In the study, students were required to engage in the activity approximately for 14 consecutive study weeks and on a fairly regular basis, i.e., at least once a week for two contact-hour classes, over the 14 consecutive study weeks. The study indicated the regular engagement over an extended time enabled students to interact reciprocally with multiple persons (e.g., classroom teachers, peers, librarians, experts/practitioners), activity, objects (e.g., library, search engines, multiple sources of public knowledge), and symbols (e.g., multiple format or styles for constructing, articulating, presenting and reflecting new knowledge and the construction of the knowledge) at multiple levels that permitted the developing processes to become gradually and increasingly more complex.

The study showed that students had spent extra time outside the contact hours of their classroom learning to search, read, understand, analyze and use public knowledge from multiple sources to inform or justify their knowledge and the construction of the knowledge at personal levels, and to later articulate, and reflect the knowledge and the construction of the knowledge with classroom teachers, peers, experts and practitioners on a social level. On the other hand, students who spent less time or engaged inconsistently in the activity, (i.e., often absent from classroom learning contact hours or participation), often missed a few stages of the activity, particularly those that were located at the end of the activity. The lack of engagement had eventually led to a lack of a gradual, reciprocal and increasingly complex interaction between students and their classroom teachers and peers, as well as with librarians, authentic sources of public knowledge and social symbols of constructing, articulating and reflecting new knowledge, which resulted in students' disengagement from constructing, articulating and reflecting understanding, as well as developing mediating artefacts for understanding. Similarly, a mere repetition of similar stages of the activity by students, i.e., searching information from multiple sources, over an extended time period, would not be of any help to students to engage in the next stages of the knowledge-building activity and participate in the complex and reciprocal processes of becoming knowledge creators.

The role of the extended time in the development processes was supported by Kuhlthau (1987), who argued that students' attitudes such as "persistence, attention to detail, and skepticism (or, caution in accepting information)" (Kuhlthau, 1987, p. 7) had enabled them to complete the subsequent stages of the activity of student learning of information skills. However, such attitudes required sufficient time to develop as the development required students to orient, interact and internalize the cognitive, affective, psychomotor domains of their engagement in the activity. In addition to attitudes, time was also used to describe the development of students' knowledge, skills, motivation, and efforts that assist students to complete the learning activity of information skills successfully (Jakobovits & Nahl-Jakobovits, 1987; Kuhlthau, 1987, p. 7).

While student engagement in the knowledge-building activity was the engine of students' development processes for becoming knowledge creators, the study also indicated that:

> [t]he form, power, content, and direction of the proximal processes effecting development vary systematically as a joint function of the characteristics of the developing person, the environment—both immediate and more remote— in which the processes are taking place, the nature of the developmental outcomes under consideration, and the social continuities and changes occurring over time through the life course and the historical period during which the person has lived.
> (Brofenbrenner & Morris, 2006, p. 798)

Accordingly, the following section discusses the influence of personal contexts of the developing person, immediate context and multiple levels of external contexts on the development processes of becoming knowledge creators in higher education.

Personal contexts of the developing persons

At the centre of the ecological process was developing persons, i.e., intended and individual students who would be developed into knowledge creators. Students' personal context was represented in Figure 3 by a vertical line that linked the knowledge-building activity with the immediate and external contexts of the development processes. Given primary persons within the immediate and external contexts supported the development processes, it was the students' personal contexts that determined the students' completion of the knowledge-building activity and participation in the development processes. Students who successfully completed the multiple stages of the activity were those students who demonstrated a high level of

reciprocity towards initiatives, contents, advices, requirement, supports or reinforcements offered by primary persons. This finding supported Bundy (2004) who viewed that students' reciprocal interactions and actions towards the primary persons, objects and symbols involved in the activity of learning with information are essential in helping students to acquire information skills. The interactions and actions would ensure that the students experience the processes for becoming knowledge creators, reflect on the experience at personal and social levels, and apply the experience to novel contexts such as constructing new knowledge and/or changing their personal contexts—prior knowledge, skills, attitudes and motivation.

However, my study found that the students' active and reciprocal action and interaction within the knowledge-building activity were associated with multiple students' personal contexts, such as their internal knowledge, skills, experience and attitudes on searching and using public knowledge from multiple sources and forms, and developing, articulating and reflecting new knowledge and its mediating artefacts. Specifically, as illustrated in Figure 3, the revised framework illustrated that students' age, ethnic, gender, social status, preferences, emotions, skills, experience, and learning assumptions, goals, and the effort that they brought to the activity of learning with information influenced their engagement in the activity, and thus interplay in the direction and power of the proximal development processes. Represented in Figure 3 by a vertical line that links individual students with stages of the activity, and immediate and multiple levels of external contexts of the proximal developing process, the dotted line of students' personal contexts indicates that students' personal contexts functioned both as indirect producers and products of the proximal development process. In this sense, while students' personal contexts had the capacity to affect the direction and power of the proximal development processes, over an extended period of time, the study expected there would be a change to the personal contexts as the result of their participation in the proximal development processes, which was one of the key features of the ecological theory of human development (Brofenbrenner, 1994 (reprinted), 1995, 2005; Brofenbrenner & Morris, 2006; Darling, 2007; Tudge et al., 2009). Not only did the study highlight the powerful and dual roles of students' personal context in the proximal development processes, it also identified the students' personal contexts could be broken down into three types of personal contexts or characteristics: demand, resource and force characteristics (Brofenbrenner & Morris, 1994 (reprinted), 1995,

2005, 2006; Darling, 2007; Tudge, Mokrova, Hatfield, & Karnik, 2009) which could influence the direction and power of the proximal development processes by different degrees.

Personal demand contexts of the developing persons

The demand characteristics or contexts referred to as "personal stimulus characteristics, [are] those that act as an immediate stimulus to another person, such as age, gender, skin color, and physical appearance" (Tudge et al., 2009). In this study, students' ethnic, age and gender emerged as the 'demand' characteristics that could differentiate students' development trajectories in becoming knowledge creators. These characteristics introduced certain expectations on forms of initial interaction that took place between developing persons, i.e., students, and principal persons, or classroom teachers and peers, librarians, and long-distance peers, experts, practitioner during their engagement in the learning activity.

Students' age

Following the Malay cultural stricture that insists younger people respect their elders, it was easier for older postgraduate students with work experience to access support or assistance, such as in using electronic and online technology to search and retrieve public knowledge from multiple sources from their younger and fresh classroom peers, than the other way around. Similarly, the feeling of respect and non-confidence toward mature classroom peers was among the factors identified by the study that led the younger and inexperienced students to keep quiet during their classroom learning; resulting in the domination of mature and experienced students in the classroom. Such cultural practices, if not addressed by classroom teachers, would inhibit the application of creative and critical thinking among younger postgraduate students; resulting in low motivation among the students to articulate and reflect their understanding and the construction process of the understanding. On the contrary, the study showed that being known as mature and experienced students, these students were motivated to committing their time and energy to complete the subsequent stages of the learning activity within and outside the classroom learning in order to receive exposure from classroom teachers as well as to prevent self-humiliation in front of their classroom teachers and peers.

The study highlighted that different age groups employed different strategies to complete the activity such as in accessing public knowledge. While mature students often accessed and used original and authentic sources available in both hardcopy and online forms that are well-known in their knowledge discipline community, young students preferred to access and use secondary or non-authentic online information sources such as reviewed works and personal blogs. In doing so, mature students were able to develop an informed perception on the frontiers of knowledge and creation of new knowledge, and thus have a better chance of completing the activity successfully in comparison to the young students. This finding supported Hargittai (2002) and OECD (2013) who found that younger individuals brought more skills in electronic and online technology into the developing process than did their mature counterparts. Such skills might be useful at the beginning stage of the learning activity when students were required to access and retrieve relevant public knowledge in multiple sources and forms. However, as students engaged in the subsequent stages of the learning activity, they were required to engage in a more complex and reciprocal interaction with principal persons, objects and symbols that required students to demonstrate and apply more than information and communication technology skills, such as critical and creative thinking skills, information analysis and synthesis skills, and verbal and writing communication skills.

The study revealed that mature postgraduate students in the study had work experience that had exposed them to an independent learning approach, and this enabled mature postgraduate students to engage in independent learning without any hesitation. The study also found that work experience provided sufficient exposure and confidence that had helped mature postgraduate students to better engage in a more complex and dialogic processes with multiple sources of information, classroom teachers and peers, librarians, experts and practitioners. Interestingly, the work experience also had instilled a sense of personal accountability among the postgraduate students upon the understanding that they had constructed, articulated, and reflected particularly during classroom learning that pushed mature postgraduate students to undertake the necessary tasks to complete the knowledge-building activity.

Students' ethnicities

The findings also showed that students from different ethnic groups brought different strategies into the knowledge-building activity. These findings were similar to literature that identified student local culture to some extent had influenced student learning of information skills (Badger & Roberts, 2005; Gorman & Dorner, 2006). While Malay students preferred to engage individually in the knowledge-building activity, Chinese students tackled the activity collectively. The findings were similar to those of Ahmad and Majid (2010) and Ahmad (2005) who found that Malay adult learners and undergraduate students favoured individual over group learning approaches. The learning approaches might explain why typical undergraduate Malay students preferred to keep their information and its sources to themselves while undergraduate Chinese students shared any they had information with each other, resulting in a pool of information from multiple information sources available for the Chinese students to choose from and later to use to construct, articulate and reflect their understandings.

Similarly, Malay students' communication styles might also explain classroom interaction among Malay students. Malay students were also reported by the teachers to communicate with classroom teachers and peers largely via "*body language*", which might not be sufficient to support the collaborative process of sharing and using information, and articulating and reflecting the understanding and the process of the understanding construction. The findings suggested that undergraduate Malay students interacted less with their classroom teachers and peers, and librarians in comparison to the undergraduate Chinese undergraduate students. On the other hand, Chinese students demonstrated good verbal communication skills during formal and informal meetings with classroom teachers and peers, and librarians. Although the lack of interaction during and outside classroom learning was not an indication of their understanding, from the viewpoint of ecological development processes, the lack of interaction suggested that there was a lack of engagement between developing persons and primary persons. This would lead to less effective development processes which require students to be involved in dialogic processes. Following the employment of a collaborative and dialogic learning approach by undergraduate Chinese students, these students were more adept in completing the knowledge-building activity in comparison to Malay students. This finding relates to Tan and Pillay (2008), Tan (2005) and Alfan and Othman (2005) who found that Chinese students were more likely to be successful in comparison to Malay students in higher learning.

This study also found that typical Malay and Chinese undergraduate students both expected that their classroom teachers would provide answers to classroom assignments and past year examination questions instead of their searching for relevant information and developing the answers on their own. The study showed that this expectation proved to be a great challenge for teachers because teachers needed to expose and train students to think critically and creatively before the students were able to work independently from the teachers to search relevant information and use the information to construct, articulate and reflect their understanding with teachers, peers, experts and practitioners. The study also showed that a student's ethnic group was no longer a primary influencing factor for differentiating students' development into knowledge creators in higher education at the postgraduate level. The study showed that, as undergraduate and postgraduate students continually engaged in the knowledge-building activity over an extended period of time on a fairly regular basis, they changed their strategies in order to attain the prescribed outcomes for every stage of the activity. This finding showed that, if a student was continuously engaged in the learning activity, their ethnic group was no longer a primary factor influencing student learning in higher education as found by Isa (1995).

Students' gender

My findings also suggested that, on average, male students' characteristics, such as their ability to think calmly while confronted by classroom teachers and peers in front of the classes, were better suited for the tasks of articulating and reflecting new knowledge and the construction process of the knowledge in comparison to female students. On the other hand, the findings also showed that some of the male students withdrew from the developing process by postponing their engagement in the learning activity to the following semester when their pride was wounded by teachers or classroom peers; while female students continued their engagement in the learning activity despite such an incident. The study also found that female students' meticulous ways of searching, reading and organizing information from multiple sources also facilitated their completion of the knowledge-building activity. Accordingly, the findings showed that as students engaged in the activity of knowledge building over an extended period of time, gender was no longer the ultimate predictor for students' development trajectories of becoming knowledge creators. The findings were supported by Hargittai (2002) and

OECD (2013) studies that found gender was not a determinant in students' acquisition of online searching and mastery of information-processing skills respectively.

Personal student resource contexts of the developing persons
Beyond students' initial interactions and actions in engaging in the activity of student learning with information, I found that students' resource contexts influenced their gradual reciprocal, active and complex interactions and actions with primary persons, objects and symbols within the activity. Resource contexts were personal characteristics that were not immediately apparent during the initial interaction, such as individuals' mental and emotional resources, past experiences, skills, intelligence and accessibility to social and material resources (Brofenbrenner, 1994 (reprinted), 1995, 2005; Brofenbrenner & Morris, 2006; Tudge et al., 2009). Beyond the personal demand contexts, students' communication skills in which the knowledge discipline was originally developed, previous study and work experiences related to their knowledge-building activity, the ability to think calmly during a heated argument, the ability to access experts and practitioners whenever needed and a preference for original and authentic information sources over tertiary and personalized information sources had differentiated their learning trajectory in the development processes of becoming knowledge creators.

These findings were consistent with studies on student learning of information skills that found students' personal experience and exposure to library or other information environments (Neely, 2000), and daily tasks, needs, and interests (Gorman & Dorner, 2006; Grassian & Kaplowitz, 2001; Joint Information Systems Committee, 2002; Lantz & Brage, 2006) and motivation (Kilic-Cakmak, 2010) influenced student acquisition of information skills, and thus their completion of the activity of knowledge building. Similar to Badger and Roberts (2005) and Hepworth and Wema (2006), the study found that students' inability to independently search information and its sources affected by their ability to evaluate and use information and its sources. On the same note, the study supported Fitzgerald (1999) that found students' critical thinking and metacognition skills influenced their evaluation of information and its sources. Similar to the literature, the study showed that students' preferences, such as their personal learning styles (Kilic-Cakmak, 2010), personality traits (Heinstrom, 2003), practices (Julien & Michels,

2004) and thoughts and emotion (Kuhlthau, 2004, 2008) informed their strategies of engagement in the development processes of becoming knowledge creators.

Personal force contexts of the developing persons

Finally I found that students' personal force characteristics, i.e., personal learning assumptions, goals, and efforts, played a significant role in differentiating their developmental trajectories in becoming knowledge creators at the later stage of the development processes. The force contexts enabled the students to initiate and sustain new and existing active and reciprocal interactions and actions with primary persons, objects and symbols of the activity. The findings were similar to the literature that highlighted academic self-concepts (Brown, 2005) and students' assumption about nature of knowledge and sources of knowledge (Badger & Roberts, 2005; Bruce, Edwards & Lupton, 2006; Bruce, 2005; Gorman & Dorner, 2006; Grassian & Kaplowitz, 2001) influenced their approaches towards information-related behaviours and thinking. The study indicated that undergraduate students need to shift their learning assumptions about teachers from seeing them as the source of knowledge into regarding teachers as facilitators of learning, and from seeing teachers as the managers of learning into seeing themselves as managers of their own learning. Unfortunately, the study found that some undergraduate students took almost one whole semester or more before shifting their learning assumptions and strategies; enduring a stressful learning experience and low academic achievement in the first semester of their study. The shifting of the learning assumptions empowered the undergraduate students to attain positive and active academic self-concepts, and thus, take necessary actions to complete the activity of knowledge building and engage in the development processes of becoming knowledge creators.

Fitzgerald (2005) argued that the way students view knowledge as either absolute or fluid, would influence students' ways of searching information sources and determining the credibility of information taken from those sources. This study found that because online sources are easily accessible to students, undergraduate and young postgraduate students used online sources without any effort to determine the credibility of these sources. Similarly, Jamali (2008) also found that students based the value of information sources, particularly online sources, on the level of their accessibility. In return, the belief had led to students' preference for online public knowledge online sources over

other types of sources (Jamali, 2008). The findings revealed a lack of critical thinking usage among undergraduate and young postgraduate students while completing the knowledge-building activity, particularly in the area of accessing valid and reliable information sources. Since this area is supported by student information skills programmes, there is a need for the programmes to train students to evaluate online information sources, in addition to exposing them to the sources. At the same time, classroom teachers must assist students to reflect on the credibility of information sources that they use in the activity of knowledge building via the employment of dialogic learning within the classroom context, i.e., the immediate context of the development processes.

Microsystem/immediate context for the development processes

The immediate or micro context referred to:

> *a pattern of activities, social roles, and interpersonal relations experienced by the developing person in a given face-to-face setting with particular physical, social and symbolic features that invite, permit, or inhibit engagement in sustained, progressively more complex interaction with, and activity in, the immediate environment.*
> (Bronfenbrenner, 1994 (reprinted), p. 39)

In my study, classroom learning emerged as the immediate context for the ecological processes for developing students into knowledge creators which was represented in Figure 3 by the dotted circle located directly below the knowledge-building activity. My finding differed from the original framework of the study that assumed student information skills programmes would become the main context for student learning of information skills.

Unlike classroom learning that engaged students in the multiple stages of knowledge-building activity for 14 consecutive study weeks, I found that student information skills programmes only engaged students in limited stages of the activity; i.e., identifying the frontiers of knowledge and accessing public knowledge, within a limited time, i.e., a two-hour session at the beginning of the 14 study weeks. With the limited stages and time, it was easy to see why the programmes were insufficient to support reciprocal and increasingly complex interactions between students and primary persons (classroom teachers and peers), multiple sources of public knowledge, and symbolic features that related to the articulation and reflection of knowledge construction process and its

mediating artefacts. Moreover I found that the immediate classroom learning context was characterized by a pattern of activities, social roles, interpersonal relations, and demands, resource, and personal contexts of primary persons not only support, but further reinforce, the students' interactions.

Classroom learning activities and assignments

The design and implementation of all classroom learning involved in the study was characterized by the knowledge-building activity which was fully integrated into the classroom learning activities and assessment. Given that the teachers gave information on learning activities and assignments to students at the beginning of the 14 study weeks, students were fully aware that they were fulfilling the classroom learning requirements and assessment whenever they engaged in the classroom learning activities and assignments. This required them individually or in groups to access, organize and use multiple sources of public knowledge to construct, articulate and reflect new understanding and its mediating artefacts. Similarly, the integrated classroom learning activities and assessment that were based on the knowledge-building activity provided a direction for teachers to provide the necessary tools, guidance, advice and assistance for students to accomplish the classroom learning activities and assignments.

Social power, roles and relationships

My study showed that teachers' social power, roles and relationships exposed and maintained students' engagement in the ecological processes for developing students into knowledge creators. Librarians and students in the study acknowledged that classroom teachers have a greater social power within the university in comparison to librarians. Due to this social power, librarians and students stated that it was easier for the teachers to reinforce students' participation in information skills programmes than it was for the librarians. For example, classroom teachers in the study had made it compulsory for their students to attend the programmes. Moreover, two of the teachers attended their students' information skills programmes to ensure their students' attendance and participation, while three other teachers further integrated an information skills assignment into their classroom learning assessment. The study also found that classroom teachers used their social power to 'force' their students to participate in reciprocal and increasingly complex interactions between student–teacher,

student–student, and student–public knowledge during classroom learning contact hours.

Classroom teachers also used their social roles—as information disseminators, knowledge construction guiders, facilitators and negotiators—to expose students to the reciprocal and increasingly complex interactions and maintain students' engagement in the interactions. The study showed that these social roles transcended the classroom learning contact hours. All teachers in the study spent extra hours within and outside their classroom learning contact hours to expose students to the multiple stages and tasks of the knowledge-building activity and later to reinforce students' continuous engagement in the activity within the 14 study weeks. Likewise, Julien and Boon (2002) and Rader (1999) found that understanding the social roles of librarians and libraries in higher learning helped both classroom teachers and librarians to work collaboratively in helping higher education students to search and use information from multiple sources in their learning process.

Lastly, I found that teachers' interpersonal relationships with students and other primary persons within external contexts also reinforced students' engagement in the long, reciprocal and increasingly complex interactions. For example, teacher–student interpersonal relationships that were based on mutual respect provided a door for students to seek guidance or simply negotiate and reflect their understanding with classroom teachers. My study also showed that strong teacher–student relationships facilitated undergraduate students' participation in and completion of the activity. Unlike postgraduate students, undergraduate students in my study discussed or reflected their understanding with classroom teachers outside classroom. This finding suggested that there is a bigger need for teachers to maintain positive and healthy classroom teacher–student relationships with their undergraduate students in order to maintain the undergraduate students' continuous engagement in the development processes.

In a similar vein, my study indicated that classroom teacher–teacher relationships that were based on a sense of cooperation also helped students to experience authentic, meaningful, reciprocal and increasingly complex interactions with experts and practitioners within certain knowledge disciplines. On the same note, classroom teacher–librarian relationships that were underpinned by mutual trust had resulted in

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structured information skills programmes which were fully integrated into the classroom learning activities and/or assessment. This finding was similar to Julien and Boon (2002) and Rader (1999) who found that collaboration efforts between classroom teachers and librarians had supported student learning of information skills across classroom learning.

Interestingly, classroom students' social power, (i.e., the degree of influence that a student has among his or her classroom peers), roles and relationship in the classroom also emerged from my study as other factors that glued students to the ecological development processes. In the study, older and more experienced postgraduate students hold a bigger social power that provides them with advantages over younger classmates while completing the knowledge-building activity. For example it was easier for the older postgraduate students to get assistance from their younger classmates in completing certain stages of the knowledge activity outside the classroom learning contact rather than the other way around. Similarly, it was easier for the more experienced postgraduate students to articulate and reflect their understanding with the less experienced classmates within and outside the classroom. Due to the high respect for elder members of the society imposed by the Malay culture, it was easier for the mature and experienced postgraduate students to communicate, or in the extreme, to impose their understanding or views on young and inexperienced classmates. In the study, young postgraduate students reported that mature postgraduate students often rejected their opinions without negotiating or reflecting their opinions systematically both during class and outside the classroom.

Likewise, students' social roles assisted students to maintain their engagement in the development process. My study showed that postgraduate students with higher social power also play a role as information providers, facilitators and guides to those younger and less experienced classmates, helping these classmates to move their trajectory in the development process. On the other hand, my study identified that some experienced students played social roles as gate-keepers to their less experienced classmates. Conversely, experienced students often discourage less experienced students from articulating and reflecting the knowledge process due to a mismatch of views between the experienced and less experienced students.

Similar social roles were also found to interplay among undergraduate students. My study found that some undergraduate students take personal initiatives to collaborate with a few selected classmates who also aimed to excel in their undergraduate studies. Upon the formation of a group, everybody was assigned certain tasks by the group and everybody monitored each other's work progress. Lacking the element of social power, (i.e., the degree of influence that a student has among his or her classroom peers), the social roles employed by undergraduate students were more flexible and spread across students, indicating any students could be the guiders, facilitators or advisers of the knowledge construction process at any point in time. However, my study suggested that, due to a lack of social power among the undergraduate students, the group maximized the teachers' social roles as guides, facilitators and advisers of the knowledge-construction process outside the classroom learning contact hours in order to complete the knowledge-building activity.

Finally my study showed that student–student relationships that were based on cooperation were essential to maintain students' engagement in the development process particularly in undergraduate students. Lacking experience in engaging and completing the multiple stages of the knowledge-building activity, undergraduate students accomplished the multiple stages of the knowledge activity by working collaboratively with a few selected classmates. The relationships developed within the study group became a source of strength for them to complete the knowledge-building activity, and thus the development processes. Similarly, social relationships between older and experienced students also led to a formation of exclusive group study in which the group membership was determined by the students' common work experience and background. The study suggested that this exclusive group helped the students to contextualize their knowledge-building activity to their work experience via providing an authentic venue for them to openly articulate, reflect and negotiate their understandings. By doing so, the group arguably minimized the teachers' social roles as guiders, facilitators and advisers in the knowledge-construction process outside the classroom learning contact hours.

Personal contexts of primary persons
My study further identified that personal contexts of classroom teachers and peers within classroom learning also influenced students' engagement in the development

process. This finding supported Bronfenbrenner (1994 (reprinted)) who argued the demand, resource and force personal contexts of primary persons who participated in the life of the developing person within the immediate context also influenced the power of the development processes. Accordingly, while existing literature suggested that librarians' efforts in examining classroom learning outcomes, syllabus and assignments were essential for the integration of information skills and classroom learning (e.g., Curzon, 2004; Iannuzzi, 1998, 1999; Wright & McGurk, 2000), the study showed that it was the initiative of classroom teachers to start and sustain their collaborative work with the librarians that had led to the integration of information skills programmes across classroom learning activities and assessments.

All the classroom teachers in my study shared a common characteristic, i.e., they knew and acknowledged that librarians have the access, expertise and infrastructure to expose students to access, search and retrieve relevant, recent and authentic public knowledge from multiple sources available in multiple forms that were essential for students to develop new public knowledge. This finding supported Julien and Boon (2002) and Rader (1999), studies that found teachers' understanding of the roles of librarians and libraries in higher learning was the key for teacher–librarian collaboration efforts in student learning of information skills. On a similar note, although these classroom teachers knew that the Internet would be able to provide students with all sorts of information, they acknowledged that the librarians have the expertise and skills to help the students access the current, relevant, valid and comprehensive public knowledge available in multiple forms. However, unlike Curzon (2004) and Wright and McGurk (2000), the study found that students' attainment of information skills was not dependent on classroom teachers' knowledge, skills, and interest in information skills, but more their classroom teachers' knowledge, skills, and interest in the knowledge-building processes located within their own knowledge discipline.

Finally, personal contexts (demand, resource, force characteristics) of classroom peers also appeared to influence students' engagement in the development process. While older and more experienced students shared previous experiences and useful public knowledge available in conventional formats with less experienced students, the latter trained the former on how to use information technology to access public knowledge available in online or digital formats. Similarly classroom peers' relationship with

experts or practitioners outside the university benefitted the students by enriching the classroom learning discussion. Moreover, while some students lagged behind the completion schedule at certain stages of the knowledge-building activity, their classroom peers who were more disciplined and committed in completing the activity (and also members of their study group) would remind them or give them motivation to work harder to complete the stages within the required timeframe. Also, it emerged in the study, that the group work dynamic was improved when students used less time to complete the knowledge activity when students were assigned to work in a group whose membership comprised different ethnicities.

Multiple external contexts for the development processes

So far my study had found that the knowledge building activity was the engine of the development processes for developing students into knowledge workers and was located within the classroom learning. However, in addition to students' personal contexts and classroom learning context, the study showed that there were multiple levels of external or remote contexts that also influenced the content and form of the development process. Represented in Figure 3 by four nested circles located directly below the immediate context (classroom learning), multiple external contexts for the development processes were identified as mesosystem (university), exosystem (local education), macrosystem (literacy field), and chronosystem (information age) contexts. The findings extended the ecological theory of human development that states:

> *The form, power, content, and direction of the proximal processes effecting development vary systematically as a joint function of the characteristics of the developing person, the environment—both immediate and more remote—in which the processes are taking place, the nature of the developmental outcomes under consideration, and the social continuities and changes occurring over time through the life course and the historical period during which the person has lived.*

(Brofenbrenner & Morris, 2006, p. 798)

Mesosystem/university context

Mesosystem is defined as "the linkages and processes taking place between two or more settings containing the developing person…In other words, a mesosystem is a system of microsystems" (Bronfenbrenner, 1994 (reprinted), p. 40). In my study, university context was identified as the mesosystem for the processes for developing students into knowledge creators. In the university context, the relations between classroom learning and university management, classroom learning and library, and classroom learning and department had influenced the form of the development processes. For example the classroom learning–library relationship had resulted in structured student information

skills programmes that exposed students' ways of searching and retrieving recent, valid and comprehensive public knowledge available in multiple formats via a systematic or step-by-step process.

Similarly, the relationship between classroom learning and department had resulted in reciprocal interaction between students and experts within the department that had led to meaningful and authentic processes for developing students into knowledge creators, which, in turn, maintained students' motivation, and thus students' continuous engagement in the development processes. On the other hand, following professional relations between classroom learning and current university policies that pushed for the development of student-centred learning and generic skills across the education programmes, classroom learning had been required to develop and implement classroom activities, assignments and assessment that involved students with learning using information incorporating independent, collaborative and dialogic learning.

These findings echoed literature such as Urena (2003) and Iannuzzi (1998) who identified the influence of institutional contexts in the design and implementation of student learning of information skills in higher education. Although Iannuzzi (1998) stressed that the key for student learning with information was the librarians' efforts in identifying and using their campus culture as 'hot spots' for the development of student learning, this study indicated that the same role was reserved for classroom teachers in the case of engaging students in the development process of becoming knowledge creators. The study showed that it was the classroom teachers who identified and used campus practice to boost students' engagement in the development process, i.e., through their relations and collaborative efforts with management, librarians and teachers and research students within the classroom teachers' departments.

Exosystem/Local education context
The exosystem found in my study consisted of "the linkage and processes taking place between two or more settings, at least one of which does not contain the developing person, but in which events occur that indirectly influence processes within the immediate setting in which the developing lives…" (Bronfenbrenner, 1994 (reprinted), p. 40). In my study the local education context emerged as the exosytem that indirectly influenced the form and content of the student development.The study found the

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relations between the university learning and the national education framework influenced the forms and direction of the development process. Introduced in the middle of 2006, the Malaysian Qualification Framework (Malaysian Qualifications Agency, 2007) proscribed for student-outcome-based learning to be the basis for higher learning in the country. As a response to the national education framework, the university later had developed their own working documents on student-outcome based learning (e.g., Pusat Pembangunan Akademik, 2008a, 2008b). The university documents described specific outcomes of student learning that must be integrated by classroom teachers in any classroom design and implementation across the university academic programmes which included students' acquisition and demonstration of a set of abilities to search, analyze and synthesize information, develop original understanding, and further communicate and negotiate the understanding via various modes within students' specific knowledge discipline.

My study showed that the national and university documents provided a catalyst for the university to align its teaching and learning missions and practice towards a student learning outcome approach that demanded students to acquire their content knowledge and generic skills independently from classroom teachers and demonstrate the knowledge and skills in their classroom learning (activities) and assessment (e.g., examination and assignments). In order to support both national and university requirements, all classroom teachers in the study required students to engage in various forms of classroom activities and assessment that supported the multiple stages of the activity of student learning with information. This required a reciprocal and increasingly complex students' interaction with multiple primary persons within immediate and external contexts (e.g., classroom teachers, peers, librarians, experts/practitioners), activity objects (e.g., library, search engines, multiple sources of public knowledge), and symbols (e.g., multiple format or styles for constructing, articulating, presenting and reflecting new knowledge and the construction of the knowledge). These findings were similar to existing literature that stated the learning outcomes and assessment for student learning of information skills must be developed and implemented in response to the national or local learning accreditation in which the institution of learning was located (Choinski, Mark, & Murphey, 2003; Dugan & Hernon, 2002; Dunn, 2002; Iannuzzi, 1999; Lopez, 2002).

My study also showed that relations between university learning and local school learning practices constituted the exosystem of students' development process of becoming knowledge creators. My research findings indicated that for some students, these practices delayed, or at worst disengaged them from the development processes. For example all undergraduate students in the study reported that they were delayed in their engagement in the development process due to their unfamiliarity with independent and collaborative learning practices that was the main learning approach employed by classroom teachers in the university. The delay was primarily due to the time that they took to develop their learning expectations and strategies to suit the new classroom learning approaches in the university. Likewise all classroom teachers and librarians were of the view that teacher-centred learning practiced in Malaysian schools had resulted in students who were unable to plan and take responsibility for their own learning, and thus did not form appropriate expectations and strategies toward university learning.

In this context, as discussed earlier, in the immediate context for student development processes, my study highlighted that force characteristics of primary persons within the immediate context of the development process, i.e., classroom teachers—their learning assumptions and goals greatly influenced teachers' efforts in assisting students to engage in the processes. My study found that all classroom teachers played different and multiple roles to different students within different timeframes in order to provide sufficient experience, knowledge and skills for students to engage in the development processes. Teachers simultaneously provided information, training, guidance, support, motivation, consultation and introduced students to primary persons in various external contexts of the processes both within and beyond the classroom learning contact hours. The teachers spent extra contact time outside the mandated contact hours to train students to use information critically and creatively in order to complete their activity of learning with information, engage students with librarians in the university, and help students to reflect their ideas, presentation and writing assignments. In this sense the study showed that the gap between students' skills, knowledge and experience for school and university learning had tremendously increased classroom teachers' workload hours, with the majority of these hours not reflected on their workload hour computation.

Macrosystem/Information field context

My study showed that 'information fields' was another layer of context that indirectly influenced the student development processes of becoming knowledge creators. Resting just outside the local education context, the information fields comprised of students' academic disciplines, levels of academic programmes and future professional employment. The information fields were also identified as the macrosystem of the development processes which was defined as "the overarching pattern of micro-, meso-, and exosystems characteristic of a given culture or subculture, with particular reference to the belief systems, bodies of knowledge, material resources" (Bronfenbrenner, 1994 (reprinted), p. 40) that indirectly influenced the development process in classroom learning.

My study showed that different knowledge disciplines have their own set of conventions or practices for discovering, accessing and using public knowledge and its sources; as well as for constructing, articulating and reflecting new public knowledge and its mediating artefacts. For example the findings showed that science students accessed and used public knowledge from journal articles that were available in online or digital databases to form their assumptions and later conducted an empirical study to test the assumptions. On the other hand, students from religious studies focused on primary sources in the form of paper documents which were not yet available in online databases to inform and discuss their understanding. It also emerged in the study that quantitative research still new to religious studies, resulting in different ways for science and religious students to complete the activity of learning with information, and thus engage in the development processes. On the other hand, education students demonstrated a similar pattern to science students except that their fieldwork rarely evolved in the science laboratory as their main respondents were human beings. The findings echoed previous studies that located information-seeking behaviour within the context of knowledge disciplines (Elmborg, 2006a, 2006b; 2002, 2003; Grafstein, 2002; Hampton-Reeves et al., 2009; Simmons, 2005, 2007).

My findings also indicated that academic programmes formed another information field that influenced the form of the development processes, particularly within classroom learning contact hours. Due to a high number of students and a lot of subject content that teachers needed to cover within their undergraduate classroom learning contact

hours, classroom teachers often employed the lecture as their main teaching and learning approach for undergraduate classes. On the contrary, postgraduate classroom learning featured collaborative learning between students and classroom teachers, in which the teachers examined and negotiated the students' understanding and processes of developing understanding. As expected, undergraduate students employed less dialogic learning in comparison with postgraduate students except for a few occasions in which students were required to present their understandings. However, due to time constraint, such exercises normally did not engage students in the negotiation or reflection of their understanding, as was often experienced by postgraduate students. However, outside the classroom, undergraduate students were found to develop their own study groups and consult their classroom teachers with regard to their collective understandings. Although in the end, both undergraduates and postgraduates seemed to reflect their understanding with classroom teachers, the study showed that undergraduate students 'performed on the stage' less publicly inside the teachers' office, while postgraduate students negotiated or reflected their understanding during classroom learning in front of the classroom teachers and peers. This indicated that dialogic learning was less practised within undergraduate classroom learning compared to postgraduate classroom learning. Moreover, undergraduate students were found to negotiate their group or collective understanding with classroom teachers in comparison to postgraduate students who negotiated or reflected their personal understandings more.

Finally, my study identified that previous, current and future students' workplaces influenced the forms of the development processes. The findings indicated that certain previous (or current) workplaces of fulltime and part-time postgraduate students respectively had exposed the students to the knowledge-building activity prior to their classroom learning thus enabling the students to better engage in the context of classroom learning; particularly in identifying the frontier of public knowledge, and thus the focus or topic of the activity. On the other hand, classroom teachers integrated the requirement of students' future workplaces in the knowledge-building activity within the classroom learning contact hours. For example classroom teachers designed classroom learning activities and assignments that required students to articulate and communicate their ideas as well as working collaboratively with classroom peers.

My study supported Takenouchi (2004) who introduced the concept of 'literacy fields' in information literacy; 'literacy' and 'information' fields referred to specific contexts in which information skills and information would be developed and applied by students respectively. For example, without the literacy fields, the meaning of the ability to use information would be empty because positions or situations of information users would influence the types of information that the users accessed, selected and used (Takenouchi, 2004). On the same note, the study showed that student knowledge disciplines (pure and social sciences), academic programmes (undergraduate and postgraduate) and employability skills demanded by future professional employers indirectly, but consistently, influenced the form of the development processes which took place in the classroom learning. These findings also supported Urena (2003) who included academic discipline, educational programmes, and future professional employment as external factors that were needed to be integrated into the development and implementation of student learning of information skills.

Chronosystem /Information Age Context

Finally, the study found that the direction of the processes for developing students into knowledge creators was also influenced by the chronosystem which is known as "the social continuities and changes occurring over time through the life course and the historical period during which the person has lived" (Brofenbrenner & Morris, 2006, p. 798). The study indicated that information age context had emphasized the use of information and communication technology in assisting students to complete their knowledge-building activity. For example, all classroom teachers sent students to information skills programmes to help students use the technology to search, access and retrieve recent the comprehensive public knowledge necessary to complete their knowledge-building activity.

Interestingly, although the development and application of technology was expected to ease students' access to information around the globe, the study found that was not the case for public knowledge. In the context of development processes, my study found that access to public knowledge and its sources was controlled two main gatekeepers: online or digital databases producers and librarians. Accordingly, students' completion of the stage of accessing public knowledge and its sources was influenced greatly by the ease of accessing the databases, and the level of easiness of interacting with its

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retrieving system, and librarians who had sufficient knowledge and skills in using and interacting with the retrieval system. This finding was supported by Jamali (2008) who found that higher education students used certain online sources because the sources were easily accessible, not because the quality of the information offered by the sources was better.

All teachers and students considered that student information skills programmes had exposed students to best use and interaction with multiple information retrieving systems that were owned and subscribed to by the university library. However, as the gatekeepers of public knowledge and its sources in the information age, a few teachers and students expected that librarians used the information communication and technology as tools or applications to educate students on the library collection and databases, as well as on using and interacting with the databases' retrieving system whenever and wherever the students needed the training most, with or without student–librarian face-to-face interaction. This study showed that a blended learning approach, one that integrated conventional and online training on the library collections and their retrieving system, would complement the training.

Due to the pervasive use of the internet in the information age, classroom teachers, librarians and students used the internet as the benchmark for their engagement in the knowledge-building activity. For example classroom teachers required students to acquire sufficient skills, knowledge and confidence in accessing public knowledge available online in order to retrieve current and comprehensive information within a shorter period. On the other hand, librarians exposed students to the library databases' retrieving system using Google Scholar because students were already familiar with Google retrieving systems. Likewise, due to the borderless access to information on the internet, students were demanding full accessibility to the library databases from their homes in order to facilitate the completion of their knowledge-building activity. However, without an integration of dialogic learning in every stage of the knowledge-building activity, the information age provides an easy road to plagiarism. For example, a few second year undergraduate students submitted writing from personal blogs as their own in order to attain better grades. With limited time in undergraduate classroom learning for classroom teachers and peers to negotiate students' understanding, the construction process of the understanding and its mediating artifacts, classroom teachers

might never find out the truth and had to assume that students had successfully completed their knowledge-building activity, and thus successfully engaged in the development processes. Accordingly, the study showed that plagiarism is the primary threat to students' development processes of becoming knowledge creators in higher education.

10.4 Implications of the Study

My study showed that the key to the partnership between teacher, librarian and student communities in higher education is in the processes for developing students into knowledge creators which features the knowledge-building activity, the personal context of the students, and immediate and multiple external contexts of the development processes. Moreover, my research findings found that the immediate context of the processes, i.e., classroom learning, plays a significant role in exposing and engaging students in the development process as well as sustaining the students' engagement in those processes via its ability to expose students to knowledge-building activity and later engage them in the activity in a regular basis over an extended time. Such regular and prolonged engagement helps students to interact reciprocally with multiple primary persons within the immediate and multiple external contexts of the development processes (e.g., classroom teachers, peers, librarians, experts/practitioners), objects (e.g., library, search engines, multiple sources of public knowledge), and symbols (e.g., multiple formats or styles for constructing, articulating, presenting and reflecting new knowledge and its mediating artefacts) that permit the developing processes to gradually become more complex. However, the study showed that classroom learning would not necessarily become the immediate context for the development processes. The challenge was to develop classroom learning that facilitates student engagement in the development processes. Based on my research findings, the following implications are discussed in relation to developing more effective classroom learning for supporting the processes for developing students into knowledge creators.

First, classroom learning must be designed and implemented based on a primary goal to assist students to develop or modify new or existing knowledge in personal and classroom learning communities. Among others, such goals could be attained via helping students "learning how to (1) learn and reflect on their learning, (2) become critical thinkers who know how to frame questions and develop a deep understanding of the issues they investigate, and (3) share their learning and work with others in the

community as resources" (Bielaczyc & Collins, 2013, pp. 10-11). However, my study showed that, although classroom learning sets a similar goal, students were left to their own devices on how to learn in higher learning, reflect their learning, and think critically to construct, articulate, and reflect their understanding and its mediating artefacts with classroom teachers, peers, experts and practitioners. The study also indicated that the lack of critical thinking skills application had led to the usage of non-credible information sources, such as personal blogs, among young undergraduate and postgraduate students. The study showed that these students were unable and unwilling to question the validity of the content generated and credibility of the sources used in the personal blogs; thus simply accepting and using the content and sources in their classroom assignments.

This problem was not confined to students. Classroom teachers also found that they need to spend extra time and efforts outside classroom to expose, guide and motivate students to think critically, and reflect and communicate their understandings. While the teachers' efforts had helped some students to acquire and apply these skills—such exposure and guidance were only received by students who consulted them during consultation hours. Respectfully, my study shows that there is a need for Malaysian universities to expose students to these skills using structured programmes. Similar to information skills programmes that help students to acquire knowledge, skills and confidence in searching and accessing information from various sources in multiple formats, similar kinds of structured programmes would potentially help students to acquire knowledge, skills and confidence in employing reflective and critical thinking skills, and communication skills that would help students to construct, articulate, reflect their understanding at personal and social levels.

This is particularly true for fresh undergraduate and postgraduate students who have just come from schools and university and do not have sufficient experience in undertaking independent and autonomous learning. The findings are supported by the university teachers, librarians and students who experienced and perceived that secondary schools in Malaysia generally practised teacher-centred learning that discouraged the acquisition and application of critical thinking skills, and independent and autonomous learning among the students. In this respect the government decision to introduce school-based assessment in secondary schools in 2014 could be seen as a strategy to expose students

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to an independent learning approach and promote critical thinking skills knowledge in secondary schools. Among others, the school-based assessment requires secondary school students to complete an independent learning project in certain subjects such as history and geography that involves students in the tasks of identifying local problems; accessing and using information from multiple sources to solve the problems, and developing a portfolio to describe the process and the outcome of the project. With such exposure, secondary school students are expected to engage in the knowledge-building activity necessary to achieve success in higher education.

Second, the classroom learning must integrate various learning activities that initiate, support and sustain students' engagement in the knowledge building process and products on a regular basis over an extended period of time. My study showed that students' completion of the knowledge-building processes involves an integration of multiple learning approaches: experiential learning, independent learning, collaborative learning, and dialogical learning. These had led to various types of integrated classroom learning activities that assist students in identifying the frontier of knowledge and later developing a topic of inquiry; students searching, accessing, interacting and using existing public knowledge to develop personal understanding that would inform their topic of inquiry. Following the knowledge building products, classroom learning activities further require students to articulate and present the understanding in multiple mediating artefacts that would provide oral, written and graphic descriptions about what they have learned, and later negotiating and reflecting what they had learned at personal and social levels with classroom teachers, peers and experts. Through employing multiple learning activities that are based on the knowledge-building process and products, students have an opportunity to deepen their knowledge on certain topics via engaging in independent and collaborative information problem-solving activities.

Third, the classroom learning must enable and sustain the role and relations between classroom teachers–student and classroom peer–student within and outside classroom contact hours. While some classroom learning activities such as lectures and student information skills are closely guided by teachers and librarians, other activities such as identifying the frontier of knowledge, and accessing public knowledge are directed by students. My study showed that the role of classroom teachers is essential in engaging students in classroom learning activities taking place within the classroom contact

hours; while the role of peer groups is equally important in engaging students in classroom learning activities that took place outside classroom contact hours. This is particularly true for those students who lack the experience and skills of learning independently from classroom teachers. The students found that their peer groups have saved a lot of their time in completing the multiple stages of the knowledge building activity, e.g., by sharing public knowledge and tips on how students go about the stages of the knowledge building that they had to complete on their own.. Equally important is that the peer groups had become the sources for students' continuous engagement in the development process where the group members continuously motivate and monitor each other's progress on the completion of the knowledge-building process against the given timeframe. Following students' completion of the learning activities that enable them to complete the knowledge-building activity and the diversity of the students' personal demand and resource contexts, the study showed that it was possible for students to have more expertise in a particular stage of the knowledge-building activity than the classroom teachers.

This finding challenges the typical student–teacher power relationship found in most classroom learning where classroom teachers are the experts which still prevails among university teachers and students. Both teachers and students in Malaysian universities must transform the conventional view into a new scenario where classroom teachers and students are collaborative learners who benefit from each other's knowledge, skills and relations—teacher–librarian, teacher–teacher, teacher–students, student–expert, student–student, students–teacher, student–expert, and student–practitioner. With such rich, diversified and legitimate learning resources available for students at the collective level, it is possible for students to go beyond the available knowledge, skills, and expertise of their classroom teachers.

Fourth, classroom learning must develop students' identity and sense of belongingness within the classroom learning community. My study showed two extreme cases involving students' identity development within the classroom community that affected the students' development process. First, mature students with work experience were found to be easily accepted by young and fresh postgraduate students in the normal context of classroom learning. Such acceptance brings a lot of connotations such as mature students are given respect, a warm welcome and necessary assistance by young

and fresh students which facilitates the mature students' engagement in the development processes. In contrast, the mature students are not giving reciprocal treatment to their young and fresh classmates. For example, while young and fresh students helped mature students to use online or digital databases to search for information which is the young students' expertise, mature students did not help their young and inexperienced classmates to construct, articulate and reflect their understanding and its mediating artefacts, which are the expertise of the mature students with work experience. Mature students also do not invite their young and inexperienced classmates into their peer groups. Other cases also showed mature and experienced students do not welcome views by young and fresh students and close any possibility for negotiating and reflecting their views within and outside the classroom.

In this sense, my study showed that, without the development of students' identity and a sense of belonging toward the classroom learning community, students are unable to tap the rich, diversified and legitimate resources for learning that would be useful for them in completing different stages of their knowledge-building activity. Classroom teachers in Malaysian universities must design classroom learning activities or assignments that help students to develop an identity at personal and classroom community levels as students participating in the multiple stages of the knowledge-building activity. For example, using group work activities, classroom teachers could create a community identity by providing experiences to students on how different subgroups within the classroom learning could work together to create the classroom learning community into joint products. My study also suggested that classroom teachers could enhance mature students' identity by recognizing and highlighting the students' expertise, knowledge, or skills that contribute to the collective understanding of the classroom learning, while simultaneously inviting (and developing the confidence of) young and inexperienced students to participate in the classroom learning. Identified in the study as the immediate context for the processes of developing students into knowledge creators, the development of classroom learning community identity among mature and experienced students and young and inexperienced students would help all students to use the rich and legitimate learning resources available in the classroom learning community to complete knowledge building, and by doing so, sustain their engagement in the development processes.

Fifthly, the study found that plagiarism is a major threat to the proximal processes of developing students into knowledge creators in higher education, particularly in the context of the information age. As they are surrounded by various information sources that are easily accessible online, the study discovered that young undergraduate students are likely to copy the sources or part of the sources into their classroom assignments. The study also indicated that the practice of plagiarism among undergraduate students could be minimized when teachers employed a dialogic learning approach in classroom learning, i.e., the immediate context for the development processes. The approach invites students' articulation and reflection of their understanding and the construction process of that understanding with classroom teachers and peers. By providing a similar weight to the process and product of the knowledge-building activity, the approach reduces the chance of students claiming credit for other people's work.

However, my study showed that undergraduate classroom learning lacks the learning activities that support the dialogic learning approach due to the high numbers of students, time limitations and heavy syllabus demands. As a result, students miss the opportunity to construct, articulate, negotiate and reflect their understanding at the social level; resulting in the development of less valid and reliable knowledge among students (which includes plagiarised work), and thus leading to less effective processes for developing students into knowledge creators. Similar patterns were seen among fresh postgraduate students who were unable to contribute to their classroom learning discussion and activities due to a lack of practice in dialogic learning. On the other hand, the study showed how a few undergraduate classroom teachers had employed dialogic learning in their tutorial classes due to a small number of students in the classes thus transforming the classes into a platform of academic discourse that invites, sustains and monitors students' participation in the development processes.

Thus, this study shows that there is a need for Malaysian universities to widen the application of discourse in classroom learning to support and sustain higher education students' engagement in the development processes as early as possible in undergraduate programmes via facilitating reciprocal interactions between classroom teacher–student and classroom peer–students within and outside classroom contact hours that emphasizes students' questioning, explaining, and discussing constructively. The construction of understandings, both in written and oral forms, enhances students'

learning how to identify their own and their peers' strengths and weaknesses in completing the knowledge-building activity and how to take and use criticism from others to strengthen their work.

Sixth, the study showed that that teachers need to collaborate with librarians to strategically engage students in student information skills programmes to help students to acquire sufficient skills in searching, accessing and retrieving information from various sources; these are needed by students to help them successfully engage in the proximal processes for developing into knowledge creators. The study found that student information skills programmes that were followed by assignments related to information search were the most effective approach in helping students to acquire and apply information search skills in knowledge-building activity. The assignments facilitated student–librarian interaction outside the programmes, enabling students to engage in a reciprocal and growing complex interaction with librarians and the library, which, in turn, increases students' knowledge and the skills involved in information search. Although such programmes required librarians to spend extra time to grade the information search assignments, the study suggested that the student–librarian interaction increased students' confidence in the librarians' expertise and role in higher learning. However, engaging students in information skills programmes alone was not sufficient to engage students in the proximal development processes because the study showed that the programmes only support students' engagement in classroom learning, identified in the study as the immediate context for the development processes.

10.5 Limitations of the Study

1. My qualitative study focuses on the experiences of Malaysian university teachers, librarians, and students to investigate student learning of information skills. Unlike most of the research to date, my study sets out to concurrently explore the experience and perception of classroom teachers, librarians and students who joined student information skills programmes concerned with the student learning of information skills. As data in qualitative studies is time-consuming to collect, and even more time-consuming to analyse, this study was conducted within one semester of the university calendar in a Malaysian university that was established to improve the academic and economic status of

Malay people, and Malay students made up the majority of the student population.

2. My understanding and then interpretation of the data in this study was reconstructed from classroom teachers', librarians' and students' own accounts gathered during my observations of student information skills programmes, un-structured interviews with classroom teachers, librarians and students, and examination of related documents available from the university or Ministry of Higher Learning. Therefore, the understanding of the teachers', librarians' and students' perspectives on the student learning may be disadvantaged by the absence of observing classroom teachers and students in classroom learning contact hours. Additionally, the interviewees' verbal reports might be biased by my participants' psychological or emotional or memory conditions during the time of their interviews or by the way I handled the interview process. Similarly, my understandings or interpretations of what I saw and heard during the observations and interviews might also have been influenced by my own emotional or memory condition during the observations and interviews.

3. Due to the process of reconstruction and de-construction involved in the qualitative data analysis, sometimes it was hard for me to separate the experience and perception of classroom teachers, librarians and students on student learning of information skills from their social, interpersonal and personal contexts that had somewhat influenced the experience and perception. Although I tried to my best to retain thick descriptions of their experience, perception and contexts, I might have lost some of their richness when I reconstructed my findings and later de-constructed the findings into the discussion which is presented in the discussion chapter.

4. My data collection was conducted within a limited period of time, following the strict schedule of the doctoral programme. Following the schedule strictly, my data collection began with observing student information skills programmes, and this was followed by interviewing classroom teachers, librarians and students respectively. As such, my interviews with students took place almost at the end of the university semester during students' revision week. While the timing enabled me to access students' experience in participating in the programmes I found that several students withdrew from their interviews due to time constraints; they were undertaking revision for their final examination or

completing assignments for their courses that were already due. Such timing lessened the maximum variation of student participants in the study which may result in less comprehensive data, and thus less comprehensive findings.

5. The majority of university teachers, librarians and students involved in my study were Malay. As a result, while the findings are useful to understand university students' engagement in information skills learning in the context of Malaysian higher education, such understanding might be limited to Malay university teachers, librarians, and students who worked and learned in a Malay-dominant university. Similarly, although my study involved three non-Malay students (two Chinese and one Indian), the understanding might also be limited to non-Malay students who learned in a Malay-dominant university.

10.6 My Growth as a Researcher

As a researcher, teacher, and doctorate student who engaged practically in an independent inquiry, this study fascinated me. The study began with a humble investigation of student learning of information skills within student information skills programmes that engaged university teachers, librarians and students. Later by the virtue of qualitative study that is emergent in nature, my research journey brought me to an exploration of students' independent research practice, known in this study as students' engagement in knowledge-building activity, which I was also experiencing as a doctorate student doing her thesis. At the beginning of the study, I spent significant time reflecting on the students' engagement in knowledge building until one day my supervisor, Andy, highlighted that I also demonstrated some characteristics of the students' engagement. Rather than distracting me from the research, I felt the realization helped me to understand my participants and to experience resonance with their experience. For example, when teachers reported that students' lack of critical thinking had hindered their engagement in the knowledge-building activity, I understood how it related to the students' engagement because I was also struggling to elevate and develop my critical thinking capacity throughout my research journey. Similarly, when a postgraduate and part-time student highlighted the challenge that she faced in managing her time for study and work, I could also relate to those feelings as I was also doing my PhD study on a part-time basis and experienced the difficulty of juggling my time between work and study. In this sense, the study helped me to be aware of my engagement in the knowledge-building activity (i.e., phases of my PhD study), and to understand my own development processes in becoming a knowledge creator in my

own personal, interpersonal and social contexts. The study also helped me to relate my development processes in becoming a knowledge creator to my responsibilities to the teachers, librarians, and students involved in this study, as well to my advisors, colleagues, superiors, students, university and to myself.

This study also provided an opportunity for me to personally experience the complex aspects of engaging, exploring, listening, and highlighting the voice of research participants in qualitative study. In retrospect, when I replayed my interview audio records and re-read my interview transcripts, I felt a sense of regret for some of the interruptions and non-relevant questions that I had made and asked during the interviews. I believed that I would have done it better with my current understanding of the topic and the interview skills acquired throughout my research journey. In my later life, the experience of doing my doctoral study, particularly doing the interviews, influenced me to become an interviewer, researcher, teacher, and subordinate who listens and appreciates other peoples' voice and to be more open to new ideas or suggestions.

I also was humbled by my experience of interpreting qualitative data. I had begun my research journey with a communities of practice perspective that I had used to guide my conception of student learning of information skills in higher education, and later to inform my research design. Following the collection of a huge amount of qualitative data from my field work study, I used the communities of practice perspective to interpret the data, resulting in the development of themes that evolved tightly around the perspective. During that time I was happy to see that my data and the communities of community perspective fitted perfectly until my supervisors warned me that it was dangerous to use the perspective as a sole framework or window to see and interpret the available data because I could only see what I wanted to see and nothing more. Although at first it was hard for me to disengage from my original theoretical framework, mainly due to the perfect fitting found between the communities of practice perspective and my available data, I conducted another round of data analysis. To my delight, when I let the data speak for itself I was able to develop more interesting and unique themes from a range of perspectives that had led to the development of rich and meaningful findings, and subsequently the development of a new working framework, i.e., the ecological and proximal processes for developing students into knowledge

creators. Underpinned by works on the ecological model of human development (Brofenbrenner, 1994 (reprinted), 1995, 2005; Brofenbrenner & Morris, 2006; Darling, 2007; Tudge, Mokrova, Hatfield, & Karnik, 2009) and knowledge building (Paavola & Hakkarainen, 2005; Scardamalia & Bereiter, 2003), the newly developed framework was able to accommodate and explain the interrelated findings from multiple perspectives. This helped me to gain a deeper understanding and appreciation of the complexity of student learning of information skills in higher education. For example, the employment of the ecological model of human development not only helped me to make sense of the multiple layers of contexts for the development processes (i.e., personal, immediate and external contexts) found by the study, it helped me further to explain the multiple layers of personal contexts of the developing persons (students) (i.e., personal demand, resource and force contexts) that influenced students' engagement in the development processes on the personal level. Similarly, the knowledge-building model developed by Paavola and Hakkarainen (2005) and Scardamalia and Bereiter (2003), provided the study with a holistic framework to understand and explain the separate tasks found in the activity of learning with information discussed in Chapter 6.

As a teacher in the university where the study was conducted, the study helped me to examine my own assumption about university and school learning. Coming from a middle-class family who stayed in a suburban area in Selangor, I completed my primary education in a national primary school that consisted of Malay teachers and students, and my secondary education in a national secondary school that made up of a fair mix of Malay, Chinese and Indian teachers and students. The only vivid memory that I had in my primary school was that once in my sixth grade, I was scolded by a female Malay teacher for asking too many questions in her classes; this teacher later placed me in a better class in term of students' academic performance. In the new class, again I was scolded by two female students who came from a good family. They argued that I had always asked the teachers the exact question that they themselves would like to ask. Looking back on these experiences I learned that a school was a very hierarchical place, where teacher–student and student–student relationships abide by certain unwritten rules that can be learned when you broke the rules. However, to my delight my secondary school was more flexible in terms of student–student relationships; perhaps most of the students came from middle-class families. I have a lot of Chinese friends in

the school because I respected their diligence doing a preparation and revision for final examination. I still remember one of my classmates, a Chinese girl named Lau Guat Tin,who invited me to her home several times for free mathematics tuition before our major national examination in Form three for that I am indebted forever as my mathematics grade improved tremendously in the national examination.

Every year our school would have a prize-giving day to reward the best students in every form in the school; this was also attended by parents. I observed that every year the majority of the prizes were awarded to Chinese students, while Malay students just conducted cultural performances during the day. When I was in Form two, I remember that I asked my Chinese mathematics tutor why Chinese people in our country were rich while Malay people were poor. He told me sternly that was not the case; similar to Malay people, a lot of Chinese people lived in poverty, which to me at the time was a revelation. I also remember that being a mediocre student, my Chinese Biology and Chemistry teachers, and Indian Physics teachers often advised me to put extra effort in on the subjects in order to pass them in a major national examination in Form five.

Due to my lack of interaction with non-Malay students in my university, I brought my previous assumptions to understanding the university learning of Chinese and Malay students. I retrospect, I perceived that Chinese students were bright students who would easily blend themselves into the university learning, while Malay students would face some difficulty doing the same. However, I learned from my study that, similar to Malay students, Chinese students struggled to engage in the independent learning approach employed in the university. Similar to a Malay undergraduate student, I was touched by a male Chinese undergraduate student when he revealed that it took him over one semester to get used to the learning approach due to his unfamiliarity with it during his school learning. The study informed me that, as a teacher in higher learning, I should never assume that my students' ethnicities and school academic performance will predict their ability to engage in independent learning and critical thinking. Realizing that both independent learning and critical thinking are the foundations for university and lifelong learning, I appreciated the government's top-down strategies to improve students' acquisition and application of independent learning and critical thinking skills in higher education institutions and schools via the introduction of Malaysian Qualification Framework in the late 2000s and School Based Assessment in

2014 respectively. As found in the study, I know now that the development processes for developing students into independent learners and critical thinkers is not an instant event, but requires an extended period of time and immediate context for the developing processes to take place. In this regard the study suggested that the immediate context for the development processes to take place is none other than classroom learning, as demonstrated by the teachers, librarians and students involved in the study.

10.7 Future Research

Based on the perspectives of Malaysian higher education teachers, librarians and students who participated in student information skills programmes, my study found the ecological processes for developing students into knowledge creators in higher education. The development processes suggested the importance of the role of knowledge-building activity, students' personal context, classroom learning context, and other multiple external contexts that influence the form, content and power of the development processes. Instead of stopping at the findings, many further questions have emerged from the study, particularly in the light of the limitations of the study discussed earlier. In this section I propose some recommendations for future research to look into the issues of supporting students' engagement in the development processes. The recommendations are as follows:

1. To study in-depth the development of learning communities in classroom learning that support students' engagement in the development processes for becoming knowledge creators and develop a framework for the classroom learning.

2. To study the role of experiential, independent, collaborative and dialogic learning in engaging students in the development processes and develop an integrated learning approach for engaging students in the development processes.

3. To study the development and implementation of dialogic learning approach in classroom learning and develop a framework to initiate and sustain the dialogic learning in classroom learning.

4. To study in-depth the role of local culture and critical thinking in the academic plagiarism practice.

5. To study the role of creative thinking in the proximal processes for developing students into knowledge creators.

6. To study in-depth the role of local and institutional culture in the development and implementation of student information skills programmes.

7. To validate the processes for developing students into knowledge creators and the influencing factors in several Malaysian and Asian universities.

8. To study the gap in students' personal force contexts that hindered them from sustaining their engagement in the proximal processes of developing students into knowledge creators, in order to identify programmes that could fill in the students' personal gaps in higher education.

9. To quantitatively test the association between students' successful engagement in the development process and the influencing factors identified in the study; i.e., students' personal characteristics, classroom learning, and multiple contexts of university, local education, information fields and the information age.

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APPENDICES

Appendix 1: Indicative interview questions for individual librarians

An individual interview with university librarians involved in student information skills programmes is designed to allow the researcher to gain a deeper understanding of aspects of the programmes that she had observed prior to the interview. The interview also aims to identify the librarians' unique experiences, practices, views, and contexts with regard to the development and running of the programmes. The wording and sequence of the interview questions will be based on the individual interviewee's answer to the relative general questions given below.

1. Can you tell me about student information skills programmes?
2. How long you have involved in the programmes?
3. Why do the university librarians offer the programmes to students?
4. How the programs assist student learning in the university? Can you tell me why?
5. How do students enrol in the programmes?
6. How do classroom teachers help students to enrol in the programmes?
7. How do you interact with the classroom teachers? Can you tell me why?
8. What do you think will facilitate your interaction with the classroom teachers? Can you tell me how? Can you tell me why?
9. What do you teach in the programmes?
10. Can you tell me about the objectives of the programmes? Can you tell me why?
11. Can you tell me about the contents of the programmes? Can you tell me why?
12. Can you tell me about the teaching and learning materials use in the programmes? Can you tell me why?
13. Can you tell me about your teaching approaches in the programmes? Can you tell me why?
14. How do you interact with students in the programmes? Can you tell me why?
15. What do you think will facilitate your interaction with the students in the programmes? Can you tell me how? Can you tell me why?
16. How do you interact with the students outside the programmes?
17. What do you think will facilitate your interaction with the students outside the programmes? Can you tell me how? Can you tell me why?
18. Can you tell me about the assessments of the programmes? Can you tell me why?
19. How do you design the assessments?
20. How the assessments improve student learning of information skills?
21. How the assessments improve the programmes?

Appendix 2: Indicative interview questions for individual teachers

An individual interview with university teachers involved in student information skills programmes is designed to allow the researcher to gain a deeper understanding of aspects of the programmes that she had observed prior to the interview. The interview also aims to identify the teachers' unique experiences, practices, views, and contexts with regard to their participation in the programmes. The wording and sequence of the interview questions will be based on the individual interviewee's answer to the relative general questions given below.

1) Can you tell me about student information skills programmes?

2) How long you have involved in the programmes?

3) How do you interact with university librarians? Can you tell me why?

4) What do you think will facilitate your interaction with the librarians? Can you tell me how? Can you tell me why?

5) Why do you enrol your students in the programmes?

6) How the programmes help your course?

7) Can you tell me about the objectives of your course?

8) How the programmes help the students to attain the course objectives?

9) Can you tell me about your course contents?

10) How the programmes help the students to master the course contents?

11) Can you tell me about your teaching approaches in your course?

12) Why do you choose particular teaching approaches in your course?

13) How the programmes facilitate your teaching approaches?

14) Can you tell me about the assessments of your course?

15) How do you design the course assessments?

16) Why do you choose particular assessments in your classroom learning?

17) How the programmes assist the students' completion of the course assessments?

18) How do you interact with students during the classroom learning? Can you tell me why?

19) What do you think will facilitate your interaction with the students during the classroom learning? Can you tell me how? Can you tell me why?

20) How do you interact with the students outside the classroom learning? Can you tell me why?

21) What do you think will facilitate your interaction with the students outside the classroom learning? Can you tell me how? Can you tell me why?

Appendix 3: Indicative interview questions for individual students

An individual interview with university students participated in student information skills programmes is designed to allow the researcher to gain a deeper understanding of aspects of the programmes that she had observed prior to the interview. The interview also aims to identify the students' unique experiences, practices, views, and contexts with regard to their participation in the programmes. The wording and sequence of the interview questions will be based on the individual interviewee's answer to the relative general questions given below.

1) Can you tell me about your information skills programme?
2) Why do you enrol in the programme?
3) Can you tell me about the objectives of the programme?
4) Can you tell me about the contents of the programme?
5) Can you tell me about the teaching and learning materials use in the programme?
6) Can you tell me about teaching approaches employed by the librarian(s) during the programmes?
7) How do you interact with the librarian(s) during the programme? Can you tell me why?
8) What do you think will facilitate the interaction? Can you tell me how? Can you tell me why?
9) How do you interact with the librarians outside the programme? Can you tell me why?
10) What do you think will facilitate the interaction? Can you tell me how? Can you tell me why?
11) How do you interact with your classroom peers during the programme? Can you tell me why?
12) What do you think will facilitate the interaction? Can you tell me how? Can you tell me why?
13) How do you interact with your classroom peers outside the programme? Can you tell me why?
14) What do you think will facilitate the interaction? Can you tell me how? Can you tell me why?
15) Can you tell me how the programme has helped you to attain your course objectives? Can you tell me how? Can you tell me why?
16) Can you tell me how the programme has helped you to master your course contents? Can you tell me how? Can you tell me why?
17) Can you tell me how the programme has helped you to complete your course assessments? Can you tell me how? Can you tell me why?

18) How do you interact with your course teacher during the classroom learning? Can you tell me why?

19) What do you think will facilitate the interaction? Can you tell me how? Can you tell me why?

20) How do you interact with your course teacher outside the classroom learning? Can you tell me why?

21) What do you think will facilitate the interaction? Can you tell me how? Can you tell me why?

22) How do you interact with your classroom peers during the classroom learning? Can you tell me why?

23) What do you think will facilitate the interaction? Can you tell me how? Can you tell me why?

24) How do you interact with your classroom peers outside the classroom learning? Can you tell me why?

25) What do you think will facilitate the interaction? Can you tell me how? Can you tell me why?

Appendix 4: Selected Samples of Nvivo trees nodes of the study

A sample of Nvivo tree nodes for components of student learning of information skills

Name	Sources	References	Created On	Created By	Modified On	Modified By
Tree Nodes						
COMPONENTS	0	0	25/6/2010 12:09:42	AAK	3/3/2011 7:04:39 AM	AAK
sewInfo	0	0	19/4/2010 8:38:54 P	AAK	24/5/2010 11:58:27 A	AAK
iInfoAnalysis-Stats	1	7	28/5/2010 8:51:21 A	AAK	30/5/2010 1:38:24 PM	AAK
infoAccess	5	11	21/4/2010 2:39:42 P	AAK	1/6/2010 11:37:11 AM	AAK
infoCollection	2	14	27/5/2010 12:00:45	AAK	31/5/2010 3:13:10 PM	AAK
infoCollectionEthics	1	3	30/5/2010 1:09:29 P	AAK	30/5/2010 4:30:58 PM	AAK
infoDistinguish	1	2	25/5/2010 2:22:35 P	AAK	25/5/2010 2:27:02 PM	AAK
infoExpose-KnowAbout	2	4	21/4/2010 4:01:22 P	AAK	25/5/2010 11:24:11 A	AAK
infoMemorize	2	3	24/5/2010 11:58:40	AAK	5/6/2010 12:31:23 PM	AAK
infoOrganize	1	1	25/5/2010 2:28:47 P	AAK	25/5/2010 3:49:05 PM	AAK
infoOwn	1	1	30/8/2010 4:06:25 P	AAK	30/8/2010 4:06:42 PM	AAK
infoPrint	1	1	20/5/2010 1:43:48 P	AAK	24/5/2010 12:01:12 P	AAK
infoProcess	3	3	21/4/2010 2:40:00 P	AAK	20/11/2010 4:24:11 P	AAK
infoRead	2	2	20/5/2010 2:06:25 P	AAK	24/5/2010 1:26:04 PM	AAK
infoSearch	6	22	21/4/2010 2:38:29 P	AAK	2/9/2010 7:25:44 AM	AAK
infoSelect	1	1	25/5/2010 12:49:04	AAK	25/5/2010 12:55:41 P	AAK
infoShare	1	1	5/6/2010 2:27:33 PM	AAK	5/6/2010 2:28:07 PM	AAK
infoUse	1	1	30/8/2010 9:57:46 P	AAK	30/8/2010 9:58:01 PM	AAK
sewInfo-sources	0	0	19/4/2010 8:39:11 P	AAK	24/5/2010 12:31:11 P	AAK
sAccess	11	53	21/4/2010 4:34:23 A	AAK	4/3/2011 5:27:12 AM	AAK
sAnalyze	4	6	17/8/2010 11:57:37	AAK	21/2/2011 8:10:57 AM	AAK
sBorrow	1	1	1/1/2011 10:20:51 P	AAK	5/1/2011 3:57:50 PM	AAK
sBrowse	1	1	1/1/2011 10:20:24 P	AAK	4/1/2011 3:38:52 PM	AAK
sBuy	1	1	31/8/2010 1:02:59 P	AAK	4/1/2011 3:39:00 PM	AAK

A sample of Nvivo tree nodes for approaches of student learning of information skills

Name	Sources	References	Created On	Created By	Modified On	Modified By
Tree Nodes						
APPROACHES	0	0	21/4/2010 6:11:09 A	AAK	21/4/2010 6:11:09 AM	AAK
ARTIFACTS	1	1	3/3/2011 5:33:14 AM	AAK	3/3/2011 5:34:21 AM	AAK
ATTENDANCE	1	1	3/3/2011 6:50:53 PM	AAK	3/3/2011 6:51:08 PM	AAK
BLENDED-LEARNING	1	3	4/3/2011 4:42:35 AM	AAK	4/3/2011 5:43:51 AM	AAK
CLASSBREAK	1	1	3/3/2011 6:33:01 PM	AAK	3/3/2011 6:35:35 PM	AAK
COLLABORATION	1	8	3/3/2011 7:09:08 PM	AAK	4/3/2011 5:49:37 AM	AAK
DISCUSSION	1	1	3/3/2011 4:16:33 PM	AAK	3/3/2011 4:17:10 PM	AAK
FACILITATING	0	0	31/12/2010 11:39:00	AAK	31/12/2010 11:39:00 A	AAK
across class	1	2	24/8/2010 2:04:04 P	AAK	24/8/2010 2:15:28 PM	AAK
across faculty learning	1	3	26/5/2010 10:31:48	AAK	26/5/2010 10:37:03 P	AAK
ADVISING	1	2	4/1/2011 2:58:32 PM	AAK	4/1/2011 10:54:40 PM	AAK
facilitating learning	7	35	21/4/2010 10:28:20	AAK	4/1/2011 10:54:35 PM	AAK
facilitating thinking	1	2	1/6/2010 12:42:23 P	AAK	5/6/2010 2:45:33 PM	AAK
flexible learning	1	1	25/5/2010 12:40:19	AAK	25/5/2010 12:40:42 P	AAK
focus learning	1	1	28/5/2010 11:52:56	AAK	28/5/2010 11:53:19 A	AAK
giving examples	1	1	30/5/2010 5:16:25 P	AAK	30/5/2010 5:18:38 PM	AAK
INCREMENTAL	1	1	4/1/2011 10:32:38 P	AAK	4/1/2011 10:33:12 PM	AAK
introduce learning	1	6	30/5/2010 1:19:54 P	AAK	31/5/2010 3:31:07 PM	AAK
motivating learning	4	7	24/5/2010 8:39:45 P	AAK	1/6/2010 1:09:26 PM	AAK
negotiating learning	3	4	24/5/2010 11:47:24	AAK	1/6/2010 1:09:31 PM	AAK
SUGGESTING	1	1	4/1/2011 2:59:52 PM	AAK	4/1/2011 3:00:08 PM	AAK
GROUP	0	0	31/12/2010 11:34:38	AAK	31/12/2010 11:34:38 A	AAK
active, learning by teach	5	8	21/4/2010 1:30:07 P	AAK	27/11/2010 12:02:56 P	AAK
collaborative group lear	4	11	21/4/2010 10:07:05	AAK	1/1/2011 10:07:03 PM	AAK

A sample of Nvivo tree nodes for social practice involved in student learning of information skills

A sample of Nvivo tree nodes for personal beliefs related to student learning of information skills

A sample of Nvivo tree nodes for personal practice involved in student learning of information skills

A sample of Nvivo tree nodes for personal traits involved in student learning of information skills

A sample of Nvivo tree nodes for personal emotion found in student learning of information skills

Name	Sources	References	Created On	Created By	Modified On	Modified By
Tree Nodes						
PERSONAL TRAITS	0	0	19/4/2010 9:22:23 P	AAK	22/3/2011 8:12:42 PM	AAK
ABILITIES	0	0	3/1/2011 2:54:00 PM	AAK	3/1/2011 2:57:26 PM	AAK
stuAbilityWisdom	5	10	20/5/2010 3:54:33 P	AAK	2/9/2010 12:48:11 AM	AAK
stuIndependent	3	3	24/5/2010 8:43:52 P	AAK	5/1/2011 11:25:40 AM	AAK
stuLanguage	5	9	20/4/2010 3:47:19 P	AAK	5/1/2011 3:57:00 PM	AAK
stuTalent-Potential	1	5	25/5/2010 1:25:50 P	AAK	25/5/2010 7:45:16 PM	AAK
ACHIEVEMENT	2	2	3/3/2011 4:34:39 PM	AAK	3/3/2011 7:35:52 PM	AAK
ATTITUDE	0	0	3/1/2011 3:41:54 PM	AAK	3/1/2011 3:41:54 PM	AAK
stuAttitudes	7	34	20/4/2010 1:45:24 P	AAK	31/8/2010 8:39:34 PM	AAK
stuJustGetBy	1	2	28/5/2010 10:39:39 P	AAK	31/5/2010 11:24:38 AM	AAK
stuStuborn	2	4	30/5/2010 12:36:58 P	AAK	5/6/2010 3:11:52 PM	AAK
teacAttitudes	5	17	20/4/2010 5:45:13 P	AAK	1/9/2010 3:56:13 PM	AAK
BELIEFS	0	0	3/1/2011 3:26:45 PM	AAK	3/1/2011 3:26:45 PM	AAK
teacBeliefs	5	42	20/4/2010 5:09:43 P	AAK	27/6/2010 12:45:07 PM	AAK
teacInterpret	1	1	25/5/2010 1:04:21 P	AAK	25/5/2010 1:12:07 PM	AAK
teacResponsibility	2	5	25/5/2010 7:31:51 P	AAK	30/5/2010 4:53:32 PM	AAK
CONCERN	0	0	3/1/2011 3:10:29 PM	AAK	3/1/2011 3:10:29 PM	AAK
libConcern	1	1	1/1/2011 10:04:44 P	AAK	1/1/2011 10:04:56 PM	AAK
teacEncourage	1	1	1/9/2010 3:57:08 PM	AAK	4/1/2011 10:56:34 PM	AAK
teaConcern	1	1	4/1/2011 10:55:30 P	AAK	4/1/2011 10:56:45 PM	AAK
teaConsider	2	7	25/5/2010 2:10:47 P	AAK	4/1/2011 10:56:19 PM	AAK