International Students Using Online Information Resources To Learn

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The work contained in this thesis has not been previously submitted to meet requirements for an award at this or any other higher education institution.
To the best of my knowledge and belief, this thesis contains no material previously published or written by another person except where due reference is made.

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Date:

Key Words

Information literacy, informed learning, learning, information, information use, online information use, reflective information use, online resources, international students, international education, cultural diversity, linguistic diversity, inclusive learning, student experience, transition, higher education, university, library, qualitative research, critical incident technique, expanded critical incident approach

Abstract

This qualitative study views international students as information-using learners, through an information literacy lens. Focusing on the experiences of 25 international students at two Australian universities, the study investigates how international students use online information resources to learn, and identifies associated information literacy learning needs.

An *expanded critical incident approach* provided the methodological framework for the study. Building on critical incident technique, this approach integrated a variety of concepts and research strategies. The investigation centred on real-life *critical incidents* experienced by the international students whilst using online resources for assignment purposes. Data collection involved semi-structured interviews and an observed online resource-using task. Inductive data analysis and interpretation enabled the creation of a multifaceted word picture of international students using online resources and a set of *critical findings* about their information literacy learning needs.

The study's key findings reveal:

- the complexity of the international students' experience of using online information resources to learn, which involves an *interplay* of their *interactions* with online resources, their affective and *reflective responses* to using them, and the cultural and linguistic *dimensions* of their information use.
- the array of strengths as well as challenges that the international students experience in their information use and learning.
- an apparent *information literacy imbalance* between the international students' more developed information skills and less developed critical and strategic approaches to using information
- the need for enhanced information literacy education that responds to international students' identified information literacy needs.

Responding to the findings, the study proposes an *inclusive informed learning approach* to support reflective information use and inclusive information literacy learning in culturally diverse higher education environments.

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Table 0.1 Key definitions applying to this thesis

KEY DEFINITIONS
Academic resources: online resources (materials and tools) available or promoted via CQU and QUT Library websites, including: - the library catalogue - external subscription-based databases, such as: *ProQuest* and *CCH* - reference materials, such as: *Oxford Reference Online* - freely available databases that are linked from the library web site, such as: *AUSTLII* - internally produced information guides and online tutorials
General resources: online resources (materials and tools) that are freely and publicly available via the Internet, such as: World Wide Web sites
Information: *anything we experience as informing, will appear differently in different contexts and disciplines* (Bruce 2008)
Information literacy: *is having access to a range of different ways of experiencing using information to learn/ interacting with information in different ways* (Bruce, 2008)
Information skills: practical IT abilities *the building blocks … that make information literacy possible* (Bruce, 2008)
Information use: *interacting with information* (Bruce, 2008)
Informed learning: *using information to learn* (Bruce, 2008); enactment of information literacy
Interactions: instances of active, learning-related use of (online) information resources; such as: developing a search strategy; evaluating online information materials. Note: interactions are integral to the online information use cycle, represented by the *Reflective online information use model* (Hughes, Edwards & Bruce 2007)
International students: students in possession of a temporary study visa issued by the Australian government (Department of Immigration and Citizenship, n.d.) Note: this term is used as an inclusive term to avoid racist and differentiating descriptors such *foreign, overseas, non-traditional, special needs, NESB* or *Asian*
Learning: *coming to see or experience the world in new ways* (Bruce 2008; Marton & Booth,1997)
Online information resources (online resources): collective term that encompasses *online materials* and *online tools*
Online materials: all/any sources (or 'containers') of information published in digital formats, such as: e-books, e-journals, academic articles, web pages, podcasts, DVDs, journal articles, reports
Online tools: electronic tools that enable people to access and search online information materials, such as: library catalogues, journal databases (*ProQuest*), search engines (*Google*)
Relational model of information literacy: *a complex of different ways of interacting with information* (Bruce, Edwards & Lupton, 2006, p. 18). Note: this model is represented by Bruce's *Seven faces of information literacy* (1997)

1

International Students as Information-Using Learners

International students represent a significant proportion of the Australian student population[1]. With widely varying personal attributes and life experiences, international students add to the rich diversity of the student population, contributing to "the noisy tapestry of cultures that brings energy and colour to the campuses and the libraries of the universities of our times" (McSwiney, 2001, p. 210). Whilst sharing the benefits of exposure to varied ideas and cultures, international students also experience the challenges of transition to life and study in an often unfamiliar environment (Ballard & Clanchy, 1997; Ramsay, Barker & Jones,1999; Ryan, 2005; Samuelowicz, 1987). Individual students' challenges may be compounded by the rapidly changing online-intensive nature of Australian higher education, where they need to use an array of online information resources to learn. To gain full potential of these resources, international students, like all learners, require well developed information literacy.

With a view to identifying information literacy learning needs, this study investigates the online resource-using experiences of 25 international students at two Australian universities. As Bruce (2008) comments: "In order to best help students learn, it is also helpful to have an understanding of their experience". This study shows that the students' resource-using experiences involve a complex interplay of *interactions*, affective and reflective *responses* and cultural and linguistic *dimensions*. In highlighting their strengths and challenges, the study's findings contribute to an empirical base for supporting international students' information literacy learning.

In undertaking this research I draw on personal and professional experiences over many years (Hughes, 2008). On a personal level, two periods as a student at Spanish universities provide insight into the experiences - and challenges - of students living and studying outside their home country. On a professional level, as educator and information professional, I am aware of the inter-personal and

[1] In Semester 1, 2007 an estimated 210,956 international students were enrolled in Australian universities, accounting for 17.3% of the university student population (IDP, 2008b).

linguistic uncertainties that individual international students might encounter. However, I am cautious about emphasising differences and difficulties. Many of the international students with whom I interact are motivated, successful learners who draw on a wealth of life experiences, and communicate in several languages. This prompts me to reflect on what we *really* know about the information literacy experiences and learning needs of international students. On a more complex pedagogical level, I wonder how to respond to culturally and linguistically-related challenges encountered by learners, without resorting to stereotypical assumptions or deficit model teaching. Through this research, and my professional practice, I seek to equitably foster the information literacy of international students - indeed all learners - in culturally diverse online-intensive higher education environments.

The thesis documents the design, development, implementation and findings of the research. This first chapter provides an overview of the study. It introduces the research problem and discusses the significance of the research. Then it outlines the conceptual frame, and the *expanded critical incident approach,* which underpin the study. The chapter concludes by presenting a summary of key findings and a brief outline of the whole thesis.

Background and Research Problem

This study views the experiences of twenty five international student students, as **information-using learners,** through an information literacy lens (Bruce, 1997, 2008; Lupton, 2008). It responds to previous research and anecdotal evidence suggesting that international students experience an array of challenges in their information use and learning. The study addresses current limitations in knowledge about the qualitative dimensions of international students' online resource use in general, and especially within Australian higher education. In this way, the study touches contemporary trends of internationalisation and online learning.

International students represent a significant proportion (17.3%) of the Australian student population (IDP, 2008b). As fee-paying students in a competitive market international students are discerning "customers" as well as "scholars" (McSwiney, 2001, p. 102). McSwiney states that "tertiary education in Australia is complex, fast-changing and not easily defined. An international student wishing to become part of this scene faces an extraordinary challenge" (1995, p. 37). Students of all

backgrounds may experience challenges in this dynamic environment. International students bring richly varied experiences to their learning, but in their transition to life and study outside their home country, individuals may experience a variety of challenges. Challenges include linguistic and social uncertainties, and unfamiliar pedagogical practices (Ballard & Clanchy, 1997; Ramsay, Barker & Jones 1999; Robertson, Line, Jones, & Thomas, 2000; Ryan, 2005), loneliness (Sawir, Marginson, Deumert, Nyland, & Ramia, 2008) and unfamiliar information-using approaches (DiMartino & Zoe, 2000; Jackson, 2005; McSwiney, 2005; Mehra & Bilal, 2007; Liao, Finn & Lu, 2007; Patton, 2002; Varga-Atkins & Ashcroft, 2004).

As a result of *internationalisation* (Knight, 1999) universities are becoming corporatised, commercially competitive and internationally focused, seeking to take advantage of wider opportunities for collaborative research and expanding educational markets (Marginson, 2006; Marginson & Van der Wende, 2007; McSwiney, 2001). Higher education is subject to tensions between economic viability and educational equity and quality (Doherty, 2006; Knight & de Wit, 1999). The concern is not simply to provide educational services in new areas, but to ensure that the services are valid for the intended student populations. Thus, McSwiney (2001) refers to pressures for educators to address the needs of a student population increasing in size and diversity, while adapting to an institutional climate of financial constraints and entrepreneurship.

Universities need to prepare graduates for a rapidly changing global society. Increasingly learning and teaching focus on real-world applications that enable students to develop generic capabilities (or attributes) in addition to discipline-specific knowledge (Barrie, 2006). Consequently, information literacy and lifelong learning often figure prominently in university policies and curricula (Bundy, 2004; Peacock, 2005).

The international students in this study are located at either Central Queensland University Brisbane International Campus or Queensland University of Technology (Australia). They are immersed in a rapidly changing, culturally diverse, and online intensive higher education environment. As McSwiney (2001, p. 192) describes:

> The remarkable development of information technology and the progress of technological innovation are dominant characteristics and fundamental driving forces of global change. The internationalisation of the higher education sector in Australia is part of this dynamic, and keeping pace with technological change, and capitalising on the potential of

information technology, are fundamental to developing and implementing the policy of internationalisation.

Therefore, the **research problem** involves determining how international students use online information resources to learn. It seeks in-depth understanding about their information literacy learning needs, contributing to an evidence-base for longer-term information literacy development within higher education.

Significance of the Study

This research addresses imperatives of educational quality, equity and sustainability in meeting the needs of diverse learners in contemporary internationalised higher education. The findings and recommendations are significant, given the high proportion of international students within Australian higher education. Stakeholders include: international students, educators, information professionals, language and learning advisers, university administrators, web designers and online resource developers. The findings support research and professional practice in various disciplines, including Higher Education and Library and Information Science. In addition, the *inclusive informed learning approach* outlined in Chapter 8 fosters reflective information-using and learning for international students, and students generally, in culturally diverse learning environments.

From the **international student perspective**, the study offers new knowledge about online information use and learning. In presenting a nuanced view of international students' experiences, the study highlights their diversity and individuality, their strengths as well as their challenges. In this way the findings extend beyond stereotypes and generalised responses sometimes found in the literature. In addition to providing insights, this study offers recommendations for enhancing international students' transition and learning outcomes

From the **information literacy perspective**, this study advances theory and practice in a significant field across the community. Information literacy is recognised internationally as an essential contributor to personal, social and economic well-being. It supports the human right to information and supports learning, in all its forms, across the community. The IFLA/UNESCO sponsored *Alexandria Proclamation* states:

> Information Literacy lies at the core of lifelong learning. It empowers people in all walks of life to seek, evaluate, use and create information effectively to achieve their personal, social, occupational and educational goals. It is a basic human right in a digital world and promotes social inclusion of all nations.
> (National Forum on Information Literacy, 2005).

The study advances information literacy theory in two ways: by extending *informed learning* principles (Bruce, 2008) to culturally diverse contexts; and by presenting conceptual models that describe the interplay of learners' *interactions* with online resources, their affective and reflective responses, and cultural-linguistic dimensions.

From a practical perspective, the study contributes an empirical basis for developing information literacy curriculum and pedagogy. The study's findings are intended to assist educators, librarians, student advisers and other professionals in their interactions with international students. The findings support inclusive reflective learning approaches that encompass using information, using language, and using cultural knowledge. For educational software developers, the findings provide an evidence base for learner-centred design and online resource improvement, of particular relevance to the international online education market.

From the **methodological perspective**, the study presents an innovative *expanded critical incident approach* that I developed and implemented in the course of the research. This approach builds upon critical incident technique (Flanagan, 1954), and has potential for further research in information literacy, education and information science.

Conceptual Frame

The study is situated within information literacy research, yet it has an interdisciplinary flavour. The study's primary concern with international students and their information literacy learning aligns it with education. The focus on information and its use brings the study into common ground with information science.

Information literacy is a maturing discipline, with a widening scope across higher education, corporate and community contexts; it is variously understood and

practised (Andretta, 2005; Breivik, 1998; Breivik & Gee, 1989; Bruce, 1997; Limberg, 1999; Lloyd, 2006; Lupton, 2004a, 2004b, 2008; Lau, 2007; Martin, 2003). Conceptually, this study aligns with Bruce's (1997) *relational model of information literacy* and reflects an inextricable connection between using information and learning (Bruce, 2008; Lupton, 2004a, 2008). Thus, I understand *information literacy* to be "a complex of different ways of interacting with information" (Bruce, Edwards & Lupton, 2006, p. 18).

The experience at the heart of the study is *using online information resources to learn*, which is multifaceted and integral to the wider experience of *using information to learn. Using information to learn* encompasses all types of intellectual and physical engagement with information. Extending beyond information skills, it includes: accessing, searching for, processing, evaluating, synthesising and communicating information, as well as using information critically, ethically, creatively and wisely to develop understandings and new knowledge. Therefore, the international student participants are learning whilst using – and learning to use – information resources. I focus on the *experience* of using (online) information for learning (Bruce, 2008; Lupton, 2004a, 2008) rather than on the *medium* of online information resources.

It is important to note that this study's *complete* view *of using information* differs from the narrower understanding of *information use* in information behaviour research. There, *information use* is represented as part of an information behaviour *continuum* (Spink & Cole, 2004), as an activity or phase that occurs after *information seeking* has occurred (Case, 2007; Kulthau, 2004). As Wilson (2000, p. 49-50) explains, information behaviour includes:

> both active and passive information seeking**,** and information use …. Information use behavior consists of the physical and mental acts involved in incorporating the information found into the person's existing knowledge base. It may involve, therefore, physical acts such as marking sections in a text to note their importance or significance, as well as mental acts that involve, for example, comparison of new information with existing knowledge.

In common with information behaviour, this study recognises the importance of *context* in human interactions with information (Dervin, 1997; Kari & Savolainen, 2007; Wilson, 1997, 1999). Similarly, this study reflects the inter-relationship between active (or behavioural), cognitive, affective and cultural dimensions

identified by information behaviour researchers (Kuhlthau, 2004; Julien, 2007; Mehra, 2004).

Diversity and *inclusivity* are recurring themes throughout this thesis. D*iversity* is a key characteristic of international students, as well as the wider Australian higher education student population of which they are part. It signifies international students' richly varied personal attributes and cultural, linguistic and educational experiences. *Inclusivity* (Biggs, 2003) is a guiding principle in studying, reporting and responding to international students' information literacy learning needs.

Research Aim, Questions and Objectives

Whilst recognising the strategic importance of international students to Australian universities, this research concerns their needs as information-using learners among a wider student population. Therefore the **aim** of the study is:
To investigate how international students use online information resources to learn, and to identify associated information literacy learning needs.

The research aim can be re-expressed as two **research questions**:
How do international students use online information resources to learn?
What are their associated information literacy learning needs?

The research questions encapsulate the key elements of the study, which are: the participants (international students), the experience under investigation (using online information resources to learn), and the research domain (information literacy). The research questions' interrogative 'how' and 'what', and the active verbs 'use' and 'learn', all imply a wide ranging exploration of the students' active engagement with online resources. The purpose of their resource use is understood to be *learning*, as "coming to see or experience the world in new ways" (Marton and Booth, 1997).

The research aim and questions guided the formulation of a set of **research objectives**, which summarise the purpose of the study and its implementation. The research objectives are as follows:

a) To gain deeper understandings about international students as information-using learners - through literature review, semi-structured interviews and observations.

b) To define the information-learning environment in which the international students are immersed - through literature review.
c) To gain empirical evidence concerning the ways in which the international students use online information resources for study purposes - through semi-structured interviews and observation of an online task.
d) To identify international students' affective and reflective responses to using online information resources use - through semi-structured interviews.
e) To identify cultural and linguistic dimensions of international students' experiences of using online resources - through semi-structured interviews.
f) To identify international students' resource-using strengths, challenges and information literacy learning approaches - through semi-structured interviews and observation.

As **outcomes** of the research I offer:

- a multifaceted word picture of international students using online information resources to learn, that provides insights into the real-life experiences of international students
- a set of *critical findings* that identify international students' information literacy needs and support the development of information literacy learning responses
- a conceptual outline for an *inclusive informed learning approach*

Methodology: Expanded Critical Incident Approach

The research aim, with its emphasis on investigating international students' information using experiences and learning needs, called for a qualitative research approach (Denzin & Lincoln, 2005; Patton, 1990). Through an *emergent* process (Lincoln & Guba, 1985) I developed an *expanded critical incident approach* that builds upon the *critical incident technique* (Flanagan, 1954). This approach has a quilt-like nature that reflects Denzin and Lincoln's (2005) notion of qualitative research as *bricolage*, integrating a variety of concepts and research strategies. During the study I carried out concurrent data collection, analysis and interpretation, which yielded an array of findings about international students' learning-related online resource use.

As with the *critical incident technique*, the *expanded critical incident approach* allowed me to focus on real-life incidents. In this study, the *critical incidents* related

to students' recent assignments involving the use of online resources. This approach enabled me to develop a nuanced view of the students' resource use. Seeking an in-depth view of the international students' real-life experiences, I engaged them in semi-structured interviews, and also observed them using online resources. Like Jackson (2005) and Mittermeyer (2005) I concentrated on examining the experiences of newly arrived international students, in order to explore their transition to life and study away from their home country.

Through inductive data analysis and interpretation I identified eight inter-connected elements of the international students' experience of using online resources to learn. These element are *students, information-environment, interactions* (instances of active resource use), *responses, strengths-challenges, information-learning, cultures-languages* and *reflections*. The findings create a multifaceted word picture of international students using online resources for learning. The word picture situates the students in their 'natural setting' (Lincoln & Guba, 1985), which is the culturally diverse information-learning environment of an Australian university. It offers varied perspectives, through students' first-hand accounts, my observations and documentary sources. A series of conceptual models complement the word picture, and contribute to the development of information literacy theory. A set of *critical findings* indicate the international students' information literacy learning needs identified by the study.

Summary of Research Findings

The study's findings respond to both elements of the research aim. First, the varied perspectives of the word picture increase understanding about international students' experiences of using online resources to learn. Second, the *critical findings* identify the international students' associated information literacy learning needs.

The study's key findings reveal:

- the complexity of the international students' experience of using online information resources to learn, which is complex and involves an *interplay* between their *interactions* with online resources, their affective and *reflective responses* to using them, and the cultural and linguistic *dimensions* of their information use.

- the array strengths as well as challenges that the international students experience in their information use and learning.
- an apparent *information literacy imbalance* between the international students' more developed information skills and less developed critical and strategic approaches to using information.
- the need for enhanced information literacy education that responds to international students' identified information literacy needs.

In response to the study's findings, I propose an *inclusive informed learning approach* that both recognises the complexity of international students' resource-using experiences and addresses the identified *information literacy imbalance*. As explained in Chapter 8, the *inclusive informed learning approach* represents an alternative to deficit learning models often present in information literacy education. The learner-centred nature of this approach takes account of identified information literacy learning needs, whilst fostering reflective information use and learning.

Thesis Outline

The thesis has nine chapters. Following this introductory chapter, *Chapter 2* sets the context, by reviewing previous research about international students and their use of online resources. I identify two research needs: first, to gain current knowledge about international students' use of information resources, especially within Australian higher education; second, to investigate emerging evidence of an *information literacy imbalance* among international students in their online resource use.

Chapter 3 provides a conceptual basis for the study, by reviewing key literature about the development of information literacy, its role in higher education and previous responses to the information literacy learning needs of international students. I identify the need for research to support the development of information literacy learning approaches which allow for the complex nature of international students' information-using experiences. In this way, the chapter elaborates the underlying purpose of the study and its theoretical foundation.

Chapter 4 describes the distinctive characteristics of the quilt-like research design, and introduces the *expanded critical incident approach*. Chapter 5 describes the

implementation of the research design, detailing the five phases of the *expanded critical incident approach*.

Chapters 6 and *7* are complementary chapters, which gradually create a multifaceted word picture of international students using online resources to learn. Responding to the two research questions, the chapters present *critical findings* about the international students' online resource use and their associated information literacy learning needs. *Chapter 6* first introduces the study's international students and situates them in their internationalised online-intensive information-learning environment at two Australian universities. It then outlines their previous and current use of online information resources for study purposes and the strengths and challenges they experienced in using them for assignments. *Chapter 7* adds qualitative dimensions of the international students' experiences. First, it reveals the ways in which the students learned, and gained help, to use online resources. Then, it outlines the students' affective and reflective responses to using them, and the cultural and linguistic dimensions of their resource-using experiences. The chapter concludes by indicating the connections between the various elements of the students' online resource-using experience and its complex nature.

Chapter 8 discusses the study's findings, in light of previous research. Then, in response to the international students' information literacy learning needs identified by the study, I propose an *inclusive informed learning approach* which draws on principles of *informed learning* (Bruce, 2008). Finally, *Chapter 9* draws the threads of the study together, outlining its contributions to knowledge and offering recommendations for further research about the online information use and information literacy learning needs of students in online-intensive culturally diverse higher education.

Conclusion

This chapter has introduced the study and indicated that the research aim is to investigate the experiences and information literacy needs of international students using online information resources to learn. I have explained that the study addresses imperatives of educational quality, equity and sustainability in contemporary internationalised higher environment, where international students are

significant as learners, and as customers. The following chapter contextualises the study and identifies two important research needs.

2
International Students and Online Information Resources

This chapter contextualises the study. I introduce international students, situate them within Australian higher education, and outline their approaches to using information resources. In reviewing key research, I detect that international students represent a significant proportion of the Australian university population, yet knowledge is still limited about their information using experiences and learning needs. I also identify an apparent *information literacy imbalance* in their resource use which warrants further investigation. In this way, the literature review leads towards the first research question which is:
How do international students use online information resources to learn?

The Internationalised Australian Higher Education Environment

International students are participants in a continuing process of internationalisation (McSwiney, 2001), which Knight (1999, p. 16) defines as "the process of integrating an international/intercultural dimension into the teaching, research and service functions of the institution". In Australia, international students are immersed in a rapidly changing educational environment that is technologically advanced and culturally diverse. Higher education is rapidly evolving as globalisation, and accompanying technological development, transform systems, policies and institutions around the world (Boezerooy, 2002; Harman, 2004; Marginson & Van der Wende, 2007).

Inevitably, global and domestic forces are changing the character and scope of Australia's universities, as they balance ever increasing demand for places with decreasing government funding (Brabazon, 2002; McSwiney, 2001). These trends are driving administrative and curricular reforms (Boezerooy, 2002; Harman, 2004; Leask, 2007) and consequently this is a dynamic environment of risks and benefits (Knight, 2007). Universities have become corporatised, commercially competitive and internationally focused to take advantage of wider opportunities for collaborative

research and expanding educational markets (Marginson, 2000, 2006; McSwiney, 2001). In addition to commercial advantage, internationalisation offers educational opportunities for cultural and language learning and curriculum enrichment (Knight & Altbach, 2007).

Internationalisation has brought about significant changes in the cultural composition of the university community (McSwiney, 2001, p. 201). International students constitute a significant proportion of the Australian higher education student population: in Semester 1, 2007 an estimated 210,956 international students were enrolled in Australian universities, accounting for 17.3% of the university student population (IDP, 2008b). International students are also important for the economic stability of Australian universities and the national economy. Australia is currently the world's fifth major destination for overseas students and in 2005 they contributed 15% of the higher education revenue (Australian Bureau of Statistics, 2007). International education services represent Australia's largest services export and the third largest export overall; in 2007/8 international education generated $13.7 billion in export revenue (more than wool, wheat or beef) (IDP, 2008a.).

In addition, rapid developments in information communication technologies are both stimulating demand for, and facilitating, distance or online education among international students (Doherty, 2006; Marginson, 2000; Mc Swiney, 2001; Mazzarol, Soutar & Seng, 2003). In Semester 1, 2007 11,622 international students were enrolled off-campus (online) and 49,709 students were studying at off-shore campuses of Australian universities (IDP, 2008b). This has implications for the ways in which courses are marketed and provided (Gomes & Murphy, 2003). As a result students encounter increasing emphasis on online learning and teaching that challenge traditional notions of 'the classroom':

> The location of the 'workplace' can be lecture halls, tutorial rooms or desktops at home, with 'home' being within or beyond the national boundary of the site of the source of the course. The classroom today is a complex construct, both 'real' and 'virtual' (McSwiney, 2001, p. 70).

However, international students are not alone responsible for cultural diversity; rather, they are part of the wider culturally diverse Australian student population, which in turn reflects the wider Australian society (Boezerooy, 2002; Harman, 2004; OECD, 2004). Domestic (Australian resident) students claim over 150 different countries of birth and over 100 different 'home' languages, including Australian

indigenous languages (Department of Education, Employment and Workplace Relations, n.d.b). According to McSwiney (2001, p. 70):

> The contemporary higher education 'classroom' in Australia is a culturally diverse workplace. Some of the cohort have been born in the 'home' country of the institution, some have migrated to the country and are now permanent residents, some are sojourning students (in Australia, it is not uncommon for these to form a majority in the class) and a significant group of students may study by distance education.

McSwiney (2001) also points out that there is a similar diversity in lecturers' and tutors' cultural backgrounds.Beyond economic considerations international students bring considerable educational and social benefits across the higher education community:

> As well as being an important revenue source, overseas enrolments can help educational institutions reach the critical mass needed to diversify the range of educational programmes offered to all students. The presence of international students offers a further benefit to all students, as well as the community more generally – an opportunity to experience and expand knowledge of other cultures and languages. (Australian Bureau of Statistics, 2007).

Higher educators, students and curriculum may all benefit from the exposure to different ideas and cultures that internationalisation allows (McSwiney, 2001). Moreover, this is not a one way-process, since student mobility is both inward and outward bound (McSwiney, 2001), whereby Australian students may complete all or part of their tertiary studies overseas.

Summary and implications: Internationalised Australian higher education environment

The literature outlined in the above section contributes contextual background to the study. In particular it indicates that:

- the Australian higher education environment is rapidly changing, culturally diverse and online-intensive

The above point represents an important consideration for the implementation of the study and application of the findings. It suggests the need for a flexible approach to information literacy research and practice, which is responsive to educational and technological change.

International Students

International students are “at the heart of this study”, as they were in McSwiney’s earlier study of international students using the Swinburne University Library (1995). They belong to a global education community, which has been likened to a “kaleidoscope of differences” (Pincas, 2001, p. 31). International students contribute a richly diverse array of personal attributes and life experiences, from widely varied geographical, cultural, linguistic, socio-economic and educational contexts (McSwiney, 1995; 2001).

Diverse learners

International students come to Australia from all around the world, from over 150 countries with widely varying linguistic, religious, literary, socio-economic and political traditions and structures. Their home countries include Bhutan, Bangladesh, Brazil, Canada, China, England, India, Israel, Jordan, Poland, Sri Lanka, Thailand, Turkmenistan, Tuvalu, Uganda, USA, Sweden, Vietnam (Australian Education International, n.d.).

Statistics alone cannot convey the diversity of international students. Sometimes they are presented as fixed entities challenged by cultural and academic change (Kettle, 2007), as “a deficit or misfit learner with special needs stemming from their cultural and/or linguistic difference” (Doherty, 2006, p. 32). In contrast, Lukic, Broadbent & Maclachlan (2004) stress that international students are not an homogeneous group. McSwiney (1995, p. 30) suggests that generalised views are based on a misconception that all international students think alike, come from similar backgrounds and understand each other, but:

> Instead they come from different nationalities; different ethnic groups; a surprisingly wide spectrum of religious beliefs and traditions which often strongly influences their way of thinking and learning and living; and speaking languages which are so different that even students from the same nation may have difficulty understanding each other’s vernacular.

Individuals have varied social identities: “They may be first-generation students: they might come from a variety of cultures; some may be graduate or returning students; and they may be lesbian, gay, bisexual or transgendered” (Jacobson, & Williams, 2000, p.1). Doherty (2006) shows that international students’ cultural identities are fluid and may alter according to learning context. Possibly, their only common

characteristic is their legal status as *international student*, which in Australia signifies possession of a temporary study visa (Department of Immigration and Citizenship, n.d.). They are required by law to attend a full-time course of a defined length that is registered on the Australian government's *CRICOS* database (Department of Education, Employment and Workplace Relations, n.d.a). International education in Australia is regulated by the Department of Education, Employment and Workplace Relations (DEEWR) Science and Training, through the *Education services for overseas students* (ESOS*) Act* (2007). International students' enrolment at an Australian university is governed by strict entry and English language criteria, which indicate educational readiness for their course (*Study in Australia*, 2008).

Transition challenges

In their transition to university, many students – domestic and international alike – encounter personal and study-related challenges (Nelson & Kift, 2005). However, the challenges may be intensified for international students (Killick, 2008; Ramsay, Barker & Jones, 1999: Ryan, 2005), who may experience varying degrees of culture shock (Furnham & Bochner, 1986) or the effects of cross-cultural adaptation (Anderson, 1994). In the following sub-sections I outline five challenges which recur through previous research, associated with personal issues, interpersonal uncertainties, English language facility, unfamiliar educational practices and library use.

On a personal level

In making the transition to life and study in their host country international students often need to negotiate unfamiliar physical environments, language usage, social customs, interpersonal relationships and educational practices (Ballard & Clanchy, 1997; Burns, 1991; McSwiney, 1995; Moeckel & Presnell, 1995; Ryan, 2005; Samuelowicz, 1987). Ballard (1984) suggests that many international students may need to make a double cultural shift in adjusting to both the Australian lifestyle and traditions of teaching and learning. They may be dealing with a range of pressing personal and daily life issues. In most cases students have left their families and social networks in their home country and may also be experiencing a sense of *cultural loneliness* (Sawir, Marginson, Deumert, Nyland, & Ramia, 2008) or loss of social status (Lacina, 2002). Financial anxieties, employment regulations, health problems, racism, homesickness, concerns about remote family members and

political instability in their home country may all contribute to students' shyness, uncertainty, disorientation and stress (Ballard, 1987; Mullins, Quintrell & Hancock. 1995; Burns, 1991; McSwiney, 1995; Sarkodie-Mensah, 2000). Ryan (2005, p. 149) vividly comments:

> … food, transport, accommodation, personal relationships, dress and even odours are different and can take some time to get used to. Even simple things such as catching a bus or buying food can be difficult and distressing. They are usually far from friends and family with whom to recount the experience, who will understand their anxiety and provide support and encouragement. This period can be a very painful one, and international students talk about doing things like spending a long time in the shower just so that they have a place to cry in private.

Interpersonal uncertainties

Various interpersonal uncertainties may hinder international students' learning and information use. Unfamiliar behavioural cues, embarrassment, fear of linguistic misunderstandings, reluctance to reveal limited knowledge or to ask apparently stupid questions, have all been shown to discourage students from consulting lecturers or library staff (Ball & Mahony, 1987; Di Martino & Zoe, 2000; Koehler & Swanson, 1988; Liu & Redfern 1997; Macdonald & Sarkodie-Mensah,1988; McSwiney, 1995; Mehra & Bilal, 2007; Moeckel & Presnell, 1995; Patton 2002; Varga-Atkins & Ashcroft, 2004). As a consequence, students may be unaware of the support available to them (Ball & Mahony, 1987; Hendricks, 1991; Kumar & Suresh, 2000; Liu & Redfern, 1997; Wayman, 1984).

Research students sometimes experience difficulties relating to their supervisors due to differing research practices between countries. International students are sometimes disappointed that their supervisors do not take a more active role in their research or develop a closer personal relationship (Ballard & Clanchy, 1997; Mehra & Bilal, 2007).

English language facility

English language facility is known to be a major contributor to international students' successful integration (Robertson, Line, Jones and Thomas 2000). Many international students use English as an additional language, and in some cases English may be a third or subsequent language (McSwiney 1995). Therefore, international students often tend to experience language-related challenges in a range of interpersonal and study contexts (Ballard,1987; Ballard & Clanchy, 1997; Burns, 1991; Ryan, 2005). Although international students are required to meet

stringent English language competency scores on arrival, they may find themselves ill-prepared for:

> the realities of everyday spoken language and academic, discipline-specific language. They will have learnt a different kind of English, which has usually been spoken in a clear and standard American accent. In this early period, students can struggle to understand even 10 per cent of what they hear. (Ryan, 2005, p. 149-150)

English usage varies markedly between countries and regions, between formal and informal contexts, between language classrooms, textbooks and the real world. Differing genres and modes of English cause difficulties even for native English speakers (Ryan, 2005). Consequently, international students are often challenged by semantic and grammatical variations in world Englishes, as well as regional accents, idiomatic expressions, jargon and slang. Variations in spoken English, between the more precise styles of their language classroom, and the rapidity and informality of real world English often present further challenges, as do unclear, soft or halting speech (Robertson, Line, Jones, & Thomas 2000; Ryan, 2005).

Since communication is a two-way process, interpersonal uncertainties, of a verbal and non-verbal nature, can trouble lecturers and students alike (Wang and Frank 2002; Sarkodie-Mensah 1992). Patton (2002, p. 91) comments:

> Librarians clarified that the difficulties were two-way: that specialized library vocabulary or informal, non-standard English words or idioms used by the library staff create comprehension problems for international students, while word choice, pronunciation of English words, and sentence structure by the international students pose obstacles for the library staff. The role of culture in non-verbal communication was also noted as a hurdle for both the international students and the librarian; for example, cultural mores about gender and age, and values such as eye contact and masking of emotions so that librarians were frustrated when they could not determine if students were satisfied with proffered help or still confused

Educational practices

On an educational level, international students encounter an array of unfamiliar situations and practices that may hinder their use of online resources. For example, students may be unused to independent or inquiry-based learning approaches that are common in countries such as Australia, the United States and Great Britain. Individuals may experience a shift from teacher-centred models of instruction based on authorised texts and lectures in their home country, to more self-directed study and information use in the host country (Ballard, 1987; Ballard, & Clanchy, 1997; Mullins, Quintrell, & Hancock, 1995; Ramsay, Barker & Jones, 1999; Robertson, Line, Jones, & Thomas, 2000; Samuelowicz, 1987). Some students may experience

a contrast between ‘western’ emphasis on discussion and inquiry-based learning with ‘eastern’ traditions that value a “conserving attitude to knowledge”, rote learning approaches and reverence for teachers (Ballard, & Clanchy 1997; Burns, 1991). However, this does not necessarily imply learning deficit. Research shows that international students are successful learners, and may draw on well developed practices such as memorisation to support deep learning (Volet & Ang, 1998; Volet & Renshaw, 1996).

Independent learning involves critical and creative interaction with a wide range of information via multiple formats and sources. To gain full potential, learners require well developed information literacy that includes understanding of library practices**,** as well as flexibility and confidence in using information and communication technologies (ICTs). However, participants in McSwiney’s (1995) study indicated that they were surprised by, or unprepared for, self-directed learning; and that they had limited or no previous experience of independently seeking information. Mehra and Bilal (2007) note similar challenges among undergraduate and postgraduate students in their study. They add that research students are unfamiliar with the research process, citing particular difficulties associated with cultural differences, and lack of efforts on part of faculty to establish a clear understanding of the process. Similarly, students are disadvantaged with learning situations and information resources that assume students are familiar with literary allusions, humour, theoretical perspectives, political and historical heritage pertaining to the host country (Macdonald & Sarkodie-Mensah, 1988).

International students may experience further challenges in applying information and participating in information literacy education. Australian classrooms are often more informal and feature greater interaction between students and lecturers than is usual in many countries. Students may be unaccustomed to interactive learning approaches that involve questioning, contributing to discussions, exploring alternative points of view, critiquing established theory and texts (Ballard & Clanchy, 1997; Burns, 1991). They may have less developed thinking and evaluative skills (Di Martino & Zoe, 2000; Hites, 1991; Moeckel & Presnell, 1995). Variations across cultures in thinking, expressing ideas and developing an academic argument can also lead to misunderstandings and frustrations (Pincas, 2001).

Unfamiliar academic and publishing conventions can also cause difficulties for students in accessing, selecting and evaluating online information (DiMartino & Zoe, 2000; Helms, C. M. (1995). These include:

- the organisation of journals in volumes and issues
- different types of publications, such as refereed articles, conference proceedings, reports, popular and trade magazines press releases
- the notion of 'primary' and secondary' sources
- indicators of a document's quality or authority

Some international students are unaware of the legal and ethical implications of information use and notions of plagiarism that prevail in countries such as Australia, since concepts of intellectual property and copyright laws may be unknown in their home country (Bretag, 2004; Robertson, 1992). Patton notes (2002, p. 95) a difference for students "doing research" in America compared with their home country: "Keeping track of where ideas were found and creating a detailed bibliography was not only unfamiliar but also frustrating to several students who explained that in their countries, they were not required to credit ideas, only exact quotations". Language limitations, as well as respect for the author's original version, are associated with some students' extensive or unacknowledged reproduction of published text.

Library use

The university library presents a variety of challenges which are similar in nature to those mentioned previously. Some students have limited or no previous experience of using an academic library in their home country (Mehra & Bilal, 2007; Wallin, Orr & Litster, 1998), and so may lack a "conceptual awareness of library" Bilal (1989, p. 143). Students from developing countries or rural areas may not have encountered a library before, or only one with a small or outdated collection (Di Martino & Zoe, 2000). Others may have experienced a library as a quiet study hall or as a textbook repository; they may not have had direct access before to a library's resources or needed to retrieve items themselves (Ball & Mahony, 1988; McSwiney, 1995; Moeckel & Presnell, 1995; Patton, 2002; Sarkodie-Mensah, 1986; Wales & Harmon, 1998). Consequently, the sheer size of a university library can be daunting:

> The quantity of books available, the complexity of indexes and catalogs for tracking down information, the multiplicity of tools at one's command, and the basic organizational patterns themselves may be bewildering and, perhaps at times, overwhelming and frightening. (Macdonald and Sarkodie-Mensah, 1998, p. 426)

A major US study (Baron & Strout-Dapaz, 2001) identifies and ranks the three main *problem areas* for international students in using an academic library as:

1) language/communication
2) adjusting to a new educational/library system
3) general cultural adjustment

Moeckel and Presnell (1995) identify two barriers that international students encounter when using American academic libraries. First, *functional barriers* inhibit basic library navigation; they include underdeveloped critical thinking skills, language, differences in educational background, differing expectations about libraries and unfamiliar library technologies. Second, *cultural barriers* are associated with practices and ideals specific to the students' home countries, as well as non-verbal behaviours and communication styles. While *functional barriers* are similar in nature to the first two *problem areas* identified by Baron and Strout-Dapaz (2001), *cultural barriers* are similar in nature to the *third problem* area noted above.

Researchers note confusion relating to library size, lay-out and procedures. For example, while some international students have not used a catalogue or followed a classification scheme before, others are familiar with alternative systems (Liu, 1993; (McSwiney, 1995; Moeckel & Presnell, 1995; Patton, 2002; Wales & Harmon, 1998). Unsurprisingly, therefore, research shows that some international students experience difficulty in finding items in the library (Allen, 1993; Bilal, 1989; Liu, 1993; McSwiney, 1995; Mehra & Bilal, 2007; Wayman, 1984). Due to differing language structures, some international students experience difficulty with left to right shelving arrangements, classification and indexes that use roman numerals or alphabetical sequencing (Hendricks, 1991; McSwiney, 1995; Patton, 2002; Robertson, 1992; Wayman, 1984).

Challenges in using the library are sometimes accompanied by, or lead to, feelings of confusion anxiety or frustration (Battle, 2004; Mc Swiney, 1995; Onwuegbuzie & Jiao, 1997). As Moeckel and Presnell (1995, p. 319) point out:

> There is a growing population of users, international students, who encounter barriers in our libraries. Some of these barriers, such as: undeveloped critical thinking skills, unfamiliarity with new technologies, and unfamiliarity with basic library research skills, are encountered by domestic students as well. However, international students have additional barriers, in cultural and language differences, which only compound frustration and sometimes cause failures in their attempts at research.

Students also may be unclear about library staff roles, believing that it is only appropriate for academics (and not students) to interact with librarians. Others equate librarians with clerks and so do not approach them for guidance with study-related issues (McSwiney, 1995). Describing his experiences as an international doctoral student in the United States, Sarkodie-Mensah (1986, p. 31) writes:

> In some foreign countries the librarian at the reference desk still possesses the image of the person with the power to claim monopoly of all knowledge, and thus is not to be disturbed. Further, societal demands in some countries require that people of a certain social status or age, or gender ask nothing but intelligent questions. Thus, with this same perception of the librarian, and the concomitant potential for ridicule, some foreign students will not approach the librarian. … Sometimes it is not easy for foreign students to realize that certain types of ignorance are acceptable, and that librarians are there to help.

Compounding their difficulties, some international students find librarians intimidating or unapproachable (Onwuegbuzie & Jiao, 1997) and consequently they fail to gain help with using the library. International students who are studying externally, or as off-shore students encounter particular challenges (Doherty, 2006; Leask, n.d.; McSwiney, 2001; Pincas, 2001) due to their remoteness from support services.

Successful learners

It is important to stress that despite the array of challenges described above, international students are often highly successful in their learning. In 2007 the 46,812 international students attending eight major Australian universities achieved a 91.6% pass rate (IDP, 2008c).

Summary and implications: International students

The literature outlined in the above section contributes contextual depth to the study, and draws attention to two key points:

- international students are culturally and linguistically diverse, and bring varied attributes and experiences to their learning
- international students often experience a range of challenges in their transition to learning and study outside their home country

The above points represent important considerations for the design and implementation of the study. They indicate the need to allow for the diversity of

international students and the possible impacts on their online resource use of their transition challenges.

Using Online Information Resources

Despite the high proportion (approximately 18%) of international students in Australia (IDP, 2008b) research about their use of online resources has been limited. Consequently, to widen the evidence-base of this study, in this section I include findings of notable research conducted outside Australia. In order to present a broad overview, I first chart international students' engagement with information resources (in general), through three phases: *pre-computer, early online* and *Internet*. This leads into a discussion of the various challenges that international students experience in using information resources. Then I briefly compare international students' use of online resources with that of the wider student population, noting similarities among research findings about international students and students generally. In particular, I note an *information literacy imbalance* between students' more developed information skills and less developed critical information use.

Previous Australian research

The most significant Australian research about international students predates the widespread use of online resources (Bigdeli, 1996; McSwiney, 1995; Mullins, Quintrell & Hancock,1995). However, it provides useful background for the developing picture of international students' information-using experiences.

A small-scale survey of international students at Central Queensland University's Sydney International Campus (Wallin, Orr & Litster, 1998) provides insight about online resource use in the Australian context. The results show that the 21 international student respondents made quite limited use of online resources apart from the library catalogue (57%) and the World Wide Web (52%). The students rated newspapers, the Internet and the stapler as more useful than online databases. They reported limited previous experience of academic libraries, but they had "little concern with using the technology" (p.4). However, the researchers noted problems in developing a database search strategy associated with limited English vocabulary.

Online resources – Phases of development

Worldwide, research about international students' use of information resources reflects three overlapping phases: *pre-computer* (1970s, 1980s and early 1990s) *early online* (early to mid 1990s) and *Internet* (late 1990s to the present). During the *pre-computer* phase, international students' information use was almost exclusively library-based, and dependent on print resources accessed through card catalogues and bibliographic indexes. During the *early online* phase the literature began to describe international students' encounters with computerised library systems such as online public information catalogues (OPAC) and bibliographic databases on CD-ROM [2]. The early online systems and databases were still mainly 'finding tools' rather than 'content providers' and students relied mainly on resources within their own library. During the *Internet* phase (late 1990s onwards) the students have drawn on an increasing range of online tools and resources, of multiple types. In contrast to the earlier phases, they are now sourcing information beyond the physical library. Despite an extensive array of full-text online materials provided by university libraries, international students (like all students) increasingly access and share information via the World Wide Web.

Pre-computer phase

Possibly the first study of international students' information use – or 'library skills' - was conducted by Mary Lewis in 1969 at the University of Hawaii. Results of Lewis's survey of sixty Asian students indicated fifteen points of difficulty for international students that included using the card catalogue and finding materials on the library shelves. She suggested solutions through specifically designed library instruction programs for international students.

Lewis's (1969) emphasis on difference and difficulty among international students recurs through much of the literature of the *pre-computer* phase. During the 1980s and early 1990s there was a growing awareness of the significance and needs of international students as academic library users, with a tendency to represent international students as a discrete group of students who are defined in terms of linguistic and cultural differences and their perceived 'unique' or 'special' needs. Authors often suggested strategies for improving communication and library

[2] Although dial-up services such as *Dialog* (n.d) were available to librarians and researchers at this time, I found no mention of international students using them.

services to international students (for example: Liestman, 1992; Helms, 1995; Hendricks, 1991).

Early online phase

With increasing access to information technologies during the *early online phase,* researchers started to report international students' use of automated library systems and electronic resources. The first major research in this area was Allen's (1993) study of 395 international students at an American university and Robertson's two surveys (1992) at Scottish universities concerning international students' use of the online public access catalogue (OPAC).

During the *early online phase* unfamiliarity with information technologies was a frequently cited source of difficulty for international students. While some students reported little or no previous experience in using computers, more often their unfamiliarity related to online resources and tools and bibliographic systems such as library catalogues and journal databases. Allen's (1993) survey showed that while the great majority of international students in her study had previously used computers, less than half had used online catalogues or databases prior to commencing study in the United States. She concluded that some international students, including those with good practical IT skills, lacked 'preparedness' to use automated systems and experienced various difficulties with information retrieval.

Similarly, Moeckel and Presnell (1995) included 'library technologies' among the *functional barriers* international students encountered in using American academic Libraries. In Australia, McSwiney (1995) noted that of the 31 international students interviewed only half had previously used a personal computer, one postgraduate student had used an online public access catalogue (OPAC) and one undergraduate had used a CD-ROM database. Robertson's (1992) two surveys of overseas students at Scottish universities showed conflicting results. The first survey conducted at a single university showed that 40% of overseas students could only sometimes use the OPAC, whereas in the second survey across ten higher education institutions, 80% of the respondents reported that they could find and use their library's catalogue.

Internet phase

During the *Internet phase* researchers have tended to adopt qualitative approaches that seek understanding of the students' experiences from their perspective (Mehra & Bilal, 2007). The students' library use is more often presented in the context of their wider educational experience in the host country. There is a decreasing emphasis on the 'otherness' of international students and their information use and increasing recognition of some commonality of experiences with domestic students (Liao, Finn & Lu, 2007; Varga-Atkins & Ashcroft, 2004).

Recent studies suggest that international students are generally familiar with using computers (Liao, Finn & Lu, 2007; Mehra & Bilal, 2007). Jackson's (2005) survey of newly arrived international students at San Jose State University indicates high levels of Internet use:

- 94% had used a library
- 84% had used a computer in a library
- 96% had used internet
- 93% had used email
- 80% had conducted some form of computerised library research
- 50% had used online chat or instant messaging

Jackson (2005, p. 204) comments that:

> International students, once viewed as technologically deprived and coming to US universities with limited computer skills, are now quite proficient in the digital age and show evidence that they, much like domestic students, think in terms of their lives as they relate to computers and computer access

Despite increasing facility with information technologies and general Internet resources, international students are often still unfamiliar with **academic information resources** such as journals and online journal databases (Liao, Finn & Lu, 2007; Mehra & Bilal, 2007). Students in Patton's (2002) study were generally familiar with online catalogues and databases, yet they were challenged by:

- the large number of separate and specialized databases available
- databases "more sophisticated" than ones they had used previously
- identifying relevant databases for particular topics

Challenges in using online information resources

International students' increasing personal use of the Internet contrasts with less use of academic online resources for study purposes. In particular, as I discuss below, research shows that international students often demonstrate limited *information-using skills* and language-related challenges.

Information-using skills

Research suggests that international students generally adopt quite basic and uncritical approaches to using online information (DiMartino & Zoe, 2000; Liao, Finn and Lu, 2007; Patton, 2002; 1998; Varga-Atkins & Ashcroft, 2004). Mittermeyer (2005) notes generally limited knowledge of basic elements of the information seeking process among international students in her study. Similarly, Varga-Atkins and Ashcroft (2004) find evidence of 'inadequate information skills' among their international student participants. Only 40.8% of the students' were assessed as having adequate to excellent information skills; other results showed:

- 30% of participants were unable to identify a correct keyword synonym
- 63% of participants were unable to distinguish Boolean operators (*and, or*)
- almost 60% were unable to identify 2 business databases from a choice of 3

Their weakest areas were evaluating information and bibliographic referencing.

The **range and complexity** of search engines and databases, with their varying subject coverage, interfaces and bibliographic fields, can be difficult for international students. Patton (2002, p. 96) notes that students seemed to have difficulty relating topics such as domestic violence or terrorism to databases that were grouped under the heading of Social Sciences. Some databases require the user to apply Boolean operators. Other databases present transparent interfaces that automatically link search terms, and yet others rely on natural language searching. As Di Martino and Zoe (2000, p. 34-5) point out:

> Even native English speakers have trouble navigating many of these systems effectively. … Keeping up with the abundance of databases now available and so common in most American libraries is a challenge even to librarians and trained information professionals.

Understanding the fields of an electronic document, and distinguishing different types of publication (such as refereed journal article, press release, conference proceeding), can prove difficult for students unfamiliar with scholarly publishing practices (DiMartino & Zoe, 2000). The notion of volumes and issues may be hard to

grasp for students who have only accessed journals by clicking on hyperlinks in a database format.

Language-related challenges

Librarians in Patton's (2002) study suggested that "language problems and critical thinking skills" were the most likely sources of difficulty for international students in online information environments. Many international students use English as an additional language. Given the English language and textual base of most academic resources, it is unsurprising that linguistic challenges in using online resources are commonly reported among international students (Baron & Strout-Dapaz; 2001; Hites, 1991; Macdonald & Sarkodie-Mensah, 1988; McSwiney, 1995; Moeckel & Presnell, 1995; Patton, 2002; Robertson, 1992; Wallin, Orr & Litster, 1998).

A major study (DiMartino & Zoe, 2000) in which 131 graduate students searched the full-text NEXIS/LEXIS CD-ROM database, demonstrates associations between students' native language and their searching results. While 71% of native English speakers indicated that they gained needed information, only half of both the Asian and European language speaking groups indicated that they gained needed information.

Formulating **search strategies** and **selecting** appropriate resources requires a vocabulary rich in synonyms and the ability to read and understand complex, specialist language. Consequently research shows that international students' resource use is sometimes hindered by limited comprehension or vocabulary. Particular difficulties are associated with unfamiliar idioms and specialist terminology such as *article, review, periodical, abstract, bibliography* and *classification* (Bilal, 1989). Mehra and Bilal (2007, p. 10) report:

> Repeatedly, international students mentioned difficulty in using digital interfaces mainly due to their inadequate level of English language skills. Searching, browsing the hierarchical structure of web directories, understanding the relationships between broad, narrow, and related terms, among others, were confusing to them. In addition, recalling keywords from limited vocabulary, and formulating effective search strategies surfaced as a major problem.

The formal and often complex nature of **academic English** can prove problematic for international and local students alike (Briguglio, 2000; Seton & Ellis, 1996).

In addition, as Pincas (2001) states, international students' challenges may be intensified in the electronic environment, where non-standard variations of English are common and paralinguistic effects (eg. social norms and values, body language, use of silence) are missing. Varying cultural dimensions of the online environment can pose particular challenges for students of non-English speaking and indigenous backgrounds (Appleton & Orr, 2000; Fjallbrant, 2000). Compounding their challenges, students may have less access to learning support, as Di Martino and Zoe (2000, p. 37) suggest:

> The irony here is that personal interaction may be most beneficial to non-native students, yet end-user searching produces exactly the opposite – human intervention is often missing.

Advanced searching techniques, which involve Boolean logic (*and/or/not*), plurals, truncations and proximity searching, require familiarity with English syntax. Thus, Zoe and DiMartino (1996; 2000) reported particular challenges in formulating advanced search strategies for students whose native language (such as Chinese) has no conjunctions or plurals. Additional language-related difficulties are linked to students' interaction with the technology. The Roman alphabet, alpha-numeric sequencing, and QWERTY keyboards may be troublesome for students whose first language uses a non-Roman script. The left to right orientation of most computer interfaces, and reading or scrolling down a computer screen, may be awkward for students accustomed to reading from right to left (such as Arabic and Japanese speakers) and in vertical columns (such as Japanese and Chinese speakers) (Robertson, 1992; Zoe & DiMartino, 2000.)

International students are sometimes **unaware** of freely available online language tools that might assist their information use. Mehra and Bilal (2007) note that their participants were unaware of multiple language interfaces provided by *Google* (2008) as well as other language resources available on the World Wide Web.

International students sometimes experience language-related **anxieties**, similar to those associated with the physical library, which may deter them from seeking help (Mehra & Bilal, 2007; Patton 2002). Some of Patton's (2002, p. 94) participants reported initial anxiety concerning which computers or resources would help with their particular need, and nearly all express frustration due to their inability to determine the "right words" for searching. Liao, Finn and Lu (2007) acknowledge a still evident, but decreasing impact of language and culturally-related barriers. These researchers note that

international students in their study appeared less embarrassed about seeking help. The students consulted reference librarians and were keen to participate in library instruction and workshops.

Mehra and Bilal (2007) draw attention to the possible impact of cultural insensitivities in the design of online interfaces. They comment that although the World Wide Web is global in nature, the representation of information is often based on western and European models of aesthetic and cultural values.

Similarities among the wider student population

Given the context of this study, until now I have concentrated on research about international students. However, Wales and Harmon (1998, p. 21) suggest that it is "instructive to view international students in relation to other students rather than in isolation". Some researchers note variations between international and local students, noting that international students tend to be less familiar with computers and academic databases (Liao, Finn and Lu (2007; Mehra & Bilal, 2007; Ramsay, Barker & Jones, 1999). However, Wales and Harmon (1998, p. 21) find a "striking similarity" between international and local participants (p. 31-2). Varga-Atkins and Ashcroft (2004) suggest that "international students' access to the Internet and electronic resources is levelling out the educational differences" (2004, p. 53) and Patton (2002, p. 98) comments: "International students are not alone in their anxiety". Tellingly, Leask (n.d.) observes that online delivery increases the cultural, social and linguistic variety of students studying a particular course and that "in an online environment all students become, in effect, 'international students' ".

Mittermeyer's research (2005) supports this view. She shows that incoming undergraduate students at 14 Canadian universities had generally limited knowledge of basic information-seeking processes. Her findings indicate similarities between local and international students regarding greater familiarity with Internet search engines than library catalogues or journal databases, and inability to distinguish between catalogues and databases. While the students successfully identified concepts and valid search terms, they were less successful in evaluating Internet information. Moreover, they demonstrated limited awareness of ethical issues associated with copying from, and referencing, documents. Mittermeyer (2005, p. 224) concludes: "These results show that one cannot assume that even

the most fundamental and long standing information tools (e.g. the library catalogue and the scholarly journal) are known to incoming undergraduates".

Selwyn, Marriott and Marriott (1999) notice a change over time. On commencing their degrees, overseas students at a Welsh University were less experienced with information and communication technologies than home students, yet the international students went on to make greater use of university computers on a daily basis and displayed slightly more positive attitudes towards using computers, compared with the home students.

In line with general social trends (Australian Bureau of Statistics, 2006; Pew Internet and American Life Project, 2007) university students of all backgrounds are turning increasingly to the Internet for information and communication. For study-related information they are shown to make higher use of the World Wide Web and popular search engines, such as *Google* and *Yahoo*, and less use of academic resources. For example, an extensive study (OCLC, 2005) conducted across six countries, including Australia, shows that over eighty percent of the college students sampled had used a search engine and email, with sixty three percent of them claiming to be familiar to extremely familiar with both. However, in comparison with these 'popular' resources far fewer students claimed to have used more academic-oriented resources such as:

- library web site – 61%
- electronic magazines/journals – 58%
- topic specific web sites – 50%
- online database – 34%

Students' preference for the Internet over academic resources is accompanied by less developed critical and strategic approaches to using information (Armstrong et al, 2001; Becker, 2003; Brown, Murphy & Nanny, 2003; Edwards 2006; Jones, 2002; Logan, 2004; Melgoza, Mennel & Gyeszly, 2002; Paris, 2002; Ray & Day, 1998). Although many younger students, who belong to the so-called Net Generation, are at home in the digital world they are not necessarily *savvy* in interacting critically, safely and ethically with information in the online environment:

> The Net Generation – today's college students who have never known life without the Internet – seem completely at home in the digital world … Their communication is increasingly digital, whether instant messaging, e-mailing photos, or sending geolocation information … Students are empowered. When they want information, they don't ask an expert or go to the library. They use the Internet and find information for themselves … Students are not only consumers of information but also active information creators – including text, images, audio, and video. It would seem then that the Net Generation is

> savvy. Despite students' skills and do-it-yourself confidence, however, concerns have arisen about their information gathering, technology use, and critical thinking approaches. When they download a resource, have they assessed the source quality? Do they understand the ethics surrounding use of others' intellectual property? Did they conduct an effective search, or did they simply grab the first result from Google? Other concerns have recently emerged, such as student understanding of privacy, security, and how the Internet works. Just as the Internet is a force for good, it has also proven to be a vehicle for mischief and abuse … perhaps students aren't as net savvy as we might have assumed. (Lorenzo & Dziuban, 2006, p. 2).

These patterns of online resource use among the whole student population suggest an apparent *information literacy imbalance*. On one side, there is a tendency towards greater use of the Internet and *Google* (2008), coupled with more developed *information skills.* On the other side, there is a tendency towards less use of academic resources, coupled with less developed *critical information using approaches*.

Summary and implications: Using online resources

The literature outlined in the above section draws attention to two key points about international students' learning-related use of information resources:

- research about international students' use of online information resources is limited, especially in the Australian higher education context; much of the research reported here predates the widespread use of the Internet and current availability of a wide range of online academic resources
- there is evidence of a general *information literacy imbalance* among international students and the wider student population, reflected in generally more developed information skills and less developed critical approaches to using information

The above points represent significant research gaps. They draw attention to the need for current in-depth knowledge about international students' use of information resources, to increase understanding about their varied experiences and learning needs. Emerging evidence of an *information literacy imbalance* warrants further attention since it relates directly to international students' online resource-using experience, whilst situating international students among the wider student population of the online learning environment. In addition, there is an evident need for further research about international students' resource use in Australian higher education, given the significant proportion of international students in this country.

Conclusion

Drawing on key literature, this chapter has contextualised the study and identified significant research gaps. I have introduced international students, and their culturally diverse online-intensive environment within Australian higher education. In reviewing previous research I have identified an array of challenges that international students experience in their information use, associated with unfamiliar resources, information-using practices and cultural variations. I have identified two research needs: first, to gain current knowledge about international students' use of information resources, especially within Australian higher education; second, to investigate emerging evidence of an *information literacy imbalance* among international students in their use of online resources. The following chapter establishes the theoretical foundation of this study and identifies current knowledge about international students' information literacy learning needs.

3
International Students and Information Literacy

Whilst the previous chapter introduced international students and their information use, this chapter considers their information literacy learning. First, to establish the theoretical context of this discussion (and of the whole thesis), I briefly outline information literacy theory and practice, highlighting its role within higher education. Then, by reviewing key literature, I identify a need to develop information literacy learning approaches that respond holistically to international student needs. In this way, the literature review leads towards the second research question:
What are the international students' associated information literacy learning needs?

Information Literacy Learning

Information literacy is variously understood and defined. Lloyd (2006, p. 578) suggests that it "is a variable construct and is shaped and understood according to context". Information literacy research has close links to Education and Information Science. This study contributes to a growing body of information literacy research, which is reviewed more fully elsewhere (Bruce, 1997; Bruce, 2008; Bruce, Candy & Klaus, 2000; Hughes, Middleton, Edwards, Bruce & McAllister, 2005; Loertscher & Woolls, 2002; Lupton, 2004a, 2008; Virkus, 2003).

Information literacy is associated with lifelong learning and information skills (Australian Information and Library Association, 2001; American Library Association 1989). Internationally, information literacy is upheld as essential for personal empowerment, and social and economic well-being, by *The Prague Declaration* (International Meeting of Information Literacy Experts, 2003) and the *Alexandria Proclamation* (National Forum on Information Literacy, 2005). Information literacy supports critical, social and political engagement (Elmborg, 2006; Kapitzke, 2003a; 2003b; Lupton, 2008).

Information literacy, as a concept, first emerged with developing information technologies in the 1970s (Zurkowski, 1974). Over the ensuing decades information literacy has continued to evolve, responding to social and

technological change. Its scope has widened from education, to corporate and community contexts (Andretta, 2005; Breivik,1998; Breivik & Gee, 1989; Bruce, 1997; Lupton, 2004a, 2004b; Lau, 2007; Martin, 2003).

Debate continues about the nature of information literacy, and its relationship to other generic skills, literacies and sociotechnical practice (Bawden, 2001; Breivik, 1998; Lorenzo & Dziuban, 2006; Marcum, 2002; Pawley, 2003; Tuominen, Savolainen & Talja, 2005). However, it is commonly associated with learning (Bruce, 1997; Kuhlthau, 2004; 2004a; Limberg, 1999), or ways of knowing (Lloyd, 2006). It may also be associated with learning through sensory and embodied information (Lloyd, 2004). Since this study is concerned with the information-using experiences and learning needs of international students, I adopt Bruce's (2008, p. 5) definition of information literacy as "experiencing different ways of using information to learn". This definition is underpinned by the relational model of information literacy, as represented by Bruce's (1997) *Seven faces of information literacy.* This definition recognises the *complex* nature of information literacy (Bruce, 1997; 2008), and reflects an inextricable link between information literacy, using information and learning (2004a; 2008).

Information literacy in higher education

Librarians have traditionally led the development and promotion of information literacy across educational sectors. The role of librarians as information literacy educators is evolving in line with the increasing prominence of information literacy within the curriculum. Information professionals are forging collaborative teaching partnerships with academic colleagues and engaging in curriculum development (Bruce, 2001; Bundy, 2003; Doskatsch, 2003; Peacock, 2005).

Early information literacy initiatives in Australia occurred in the school library sector in the 1970s (Bundy, 2004; Kirk, 1986). Notably, the Australian School Library Association's information literacy and electronic information policies (1994a; 1994b) predated the major declarations mentioned above (Australian Information and Library Association, 2001; American Library Association, 1989; International Meeting of Information Literacy Experts, 2003; National Forum on Information Literacy, 2005). In Australian universities, information literacy was first promoted through library-run bibliographic instruction and user education programs, which tended to focus on generic information skills. Broader, more course-related

information literacy programs were developed through the 1990s to the extent that information literacy is now integrated to some degree in most university curricula (Bundy, 2004). Information literacy has become widely recognised as an essential graduate attribute (or capability) (Barrie, 2006) that extends beyond formal course requirements to ongoing personal and professional learning.

> By leading individuals to think critically, and by helping them construct a framework for learning how to learn, educational institutions provide the foundation for continued growth throughout the careers of graduates, as well as in their roles as informed citizens and members of communities. (Lupton, 2004)

Information literacy education in universities takes varying forms, from generic skills based programs to integrated curricula; and it involves a wide range of strategies and frameworks (Association of College and Research Libraries, 2000; Bundy, 2004; Corrall, 2007; Johnston & Webber, 2003; Loertscher & Woolls, 2002; Markless & Streatfield, 2007; Martin, 2003; Standing Conference on National and University Libraries, 2006). The *Six frames of information literacy* (Bruce, Edwards, & Lupton, 2006) offers a useful overview of six different ways in which students and educators may experience information literacy education. The six *frames* (or approaches to information literacy education) are:

1) **Content frame** – discipline orientation
2) **Competency frame** – behavioural orientation, information skills
3) **Learning to learn frame** – constructivist orientation, reasoning and problem-solving
4) **Personal relevance frame** - experiential orientation, personal meaning
5) **Social impact frame** – social reform orientation, community problems, policy, action
6) **Relational frame** – orientation towards learners' awareness of information literacy, a complex of different ways of interacting with information

As Bruce, Edwards, & Lupton (2006) explain, the sixth *Relational frame* is associated with Bruce's (1997) *Seven faces of information literacy* and her recently developed *informed learning* (2008) principles.

Johnston and Webber (2003) point out that attention has focused mainly on student learning and graduate attributes. As a natural progression, they suggest a model of the information literate university that is "aware of developments, evaluating, and seeing opportunities for knowledge creation, extension and wisdom".

In Australian universities, information literacy educators frequently adopt the *Australian and New Zealand information literacy standards* (Bundy, 2004) as a framework for curriculum development and implementation. Standards are

beneficial in supporting consistent, structured approaches to information literacy. On the other hand, they tend to emphasise discrete competencies, engendering sequential “tick the box” processes (Johnston, & Webber, 2003, p. 337), rather than broader learning approaches.

The two universities featured in this study offer extensive information literacy programs. Central Queensland University (CQU) Library offers information literacy programs that “work within the generic skills framework of the University to ensure students learn the information access skills demanded by employers” (Central Queensland University Library, 2006). Queensland University of Technology (QUT) Library’s (2004) *Policy on information literacy* indicates a commitment to lifelong learning, learner empowerment and curriculum alignment. Currently, QUT Library is collaborating with the University’s Teaching and Learning Support Services (TALSS) in an Integrated Literacies Project to develop a combined academic skills-information literacy support service (Peacock, 2008).

Relational model of information literacy

The relational model of information literacy represented by Bruce’s (1997) *Seven faces of information literacy* represents a complex understanding of information use. Bruce proposes that approaches built on the *relational model* encourage students to learn by experiencing information literacy in different ways. Importantly for rapidly changing online information environments, the *relational model* aims to promote flexible learning approaches rather than specific skills or sequential processes, as Bruce (1997, p. 151) explains:

> Information literacy is not a linear process, nor is it necessarily technology driven as is often suggested in the literature; it is also not readily definable as a set of skills. Instead people’s experience of information literacy is an intricately woven fabric, revealing different patterns of meaning depending on the nature of the light cast upon it.

The seven faces of information literacy (Bruce, 1997) has influenced the development of information literacy theory and practice since its publication in 1997. It is recognised internationally as a seminal work (Byrne, 2005; Bundy, 2003; Grafstein, 2007; International Federation of Library Associations, & UNESCO, 2007; Maybee, 2006; Wilson, 2004), and it is widely cited by information literacy researchers (for example, Lloyd, 2004; 2006; Limberg, & Sundin, 2006; Johston, &

Webber, 2003). Bruce's work also provided the conceptual basis for the *Australian and New Zealand information literacy framework* (Bundy, 2004).

The *Seven faces of information literacy* (Bruce, 1997) represent information literacy as a complex of different ways of experiencing information literacy (IL). The different ways are represented as seven *conceptions* or *faces*, as follows:

- **First face - Information technology:** IL is seen as using information technology for information retrieval and communication; information use involves becoming aware of existing information
- **Second face - Information sources:** IL is seen as finding information located in information sources; information use is centred on location and retrieval
- **Third face - Information process:** IL is seen as executing a process; information use involves recognition and organization, or problem solving
- **Fourth face - Information control:** IL is seen as controlling information; information use involves recognition and organization, or problem solving
- **Fifth face - Knowledge construction:** IL is seen as building up a personal knowledge base in a new area of interest
- **Sixth face - Knowledge extension:** IL is seen as working with knowledge to gain new insights
- **Seventh face – Wisdom:** IL is seen as using information wisely for benefit of others

The seven *faces* or *conceptions* were identified in a study of university educators, who were considered to be highly effective information users, real people, working with information, in real situations. The *faces* represent "qualitatively different relations between individuals and some aspect of their learning environment" (Bruce, 1997, p. 14). Thus the faces do not describe individuals' information usage or information literacy itself: "Instead they are descriptions of the ways in which higher educators relate to aspects of the world in their experience of information literacy" (Bruce, 1997, p.153). Bruce states that although the *faces* carry equal significance, some are more complex than others and reflect more sophisticated ways of using information.

Importantly for this study, the *relational model of information literacy* supports a holistic approach to information literacy learning that is based on the variation theory of learning (Marton & Booth, 1997). Bruce (1997, p.171) proposes that people learn by "coming to experience effective use of information in new and increasingly complex ways". In highlighting variations in individual perceptions of information literacy, the *relational model* focuses learners' attention on information and how they interact with it, rather than on the technology and its use. In this way, the relational model also shifts the emphasis from information literacy practitioners' interpretations of information users' needs, to learners' experiences of using information. Rather than prescribe required skills, the relational model encourages experiential and

reflective learning about information use in real situations. Learners are not just acquiring knowledge and skills, they are learning to recognize information needs and develop strategies in unfamiliar contexts.

Informed learning

Informed learning (Bruce 2008) marks a recent advance in information literacy theory and practice. While the *Seven faces of information literacy* (Bruce, 1997) offers theoretical understanding about information literacy, *informed learning* supports its enactment. Thus, Bruce (2008, p. 5) describes *informed learning* as "using information to learn", stating that it extends the *relational model of information literacy*. In this way*, informed learning* supports active, experiential, reflective and contextualised learning. It provides a basis for developing and implementing curriculum that enables students to experience different information practices. Through a reflective process, students make their learning about those practices explicit, and so may transfer their learning to new contexts. Rather than focus on separate information skills, *informed learning* aims to promote critical and strategic approaches to complex problems and diverse contexts.

Bruce (2008) indicates the suitability of *informed learning* for use across the university, at all levels, from designing a class or online unit, to managing a whole research project. She also anticipates its application to workplace and community learning. From the international students' point of view, *informed learning* offers a means to extend their awareness of information resources. Through *informed learning* they might develop critical and strategic approaches to using information. In addition, they would have the opportunity to learn about, and reflect on, their current information learning environment. By enabling students to engage confidently with information in new physical and online environments, *informed learning* offers potential to address learning needs identified by this study.

Summary and implications: Information literacy learning

The literature outlined in the above section draws attention to two key points which are essential to this study:

- information literacy supports learning
- information literacy theory and practice respond to educational needs and technological change

This study's concern with *using online information resources to learn* aligns with conceptions of information literacy as a multifaceted experience (Bruce, 1997) and the inextricable connection between using information and learning (Lupton, 2004a, 2008). Thus, Bruce's (1997) *relational model of information literacy* provides the conceptual frame for this research. Principles of *informed learning* (Bruce, 2008) support the inclusive reflective information literacy learning approach that I propose in Chapter 8 when responding to information literacy learning needs identified by this study.

Information Literacy Learning for International Students

Returning to international students, this section considers their information literacy learning needs. By reviewing previously reported information literacy initiatives, I identify the need for a learning approach that holistically supports international students' study-related information use

International students' information literacy needs

The research reviewed in Chapter 2 indicates that international students experience an array of inter-related resource-using challenges, which are associated with:

- unfamiliar academic resources
- over-supply of information and information resources
- changing information and communication technologies
- uncritical information-using approaches
- English language limitations
- unfamiliar academic and publishing conventions resources
- inter-personal and cultural uncertainties
- library and information-using anxieties

These inter-related challenges would seem to require information literacy learning responses that take account of a variety of educational needs and affective, cognitive, and cultural influences (Mehra & Bilal, 2007; Ramsay, Barker & Jones, 1999; Robertson, Line, Jones & Thomas, 2000). To date, however, educational programs have tended to focus on particular information skills, rather than supporting more integrated approaches to using information and learning.

The literature outlines a variety of strategies that have been developed over the last twenty years in response to international students' information-using challenges. These have generally been library-centred, reflecting librarians' traditional leadership in information literacy education. Early initiatives, which tended to treat international students as a special needs group, involved customised 'library skills' or 'bibliographic' instruction' (for example: Allen, 1993; Liestman, 1992; McCullagh & O'Connor, 1989; Helms, 1995; Macdonald & Sarkodie-Mensah, 1988). By the mid-1990s there was a growing recognition of the need for more integrative responses, combining information skills, with academic or language skills (Morgan, 2001, 2002; Kamhi-Stein & Stein, 1998; Seton & Ellis, 1996), and cross-cultural communication for library and campus-wide settings (Zhang, 2006). Thus Moeckel and Presnell (1995) devised a framework to address "cultural" and "functional barriers" to using libraries, which incorporated library promotion, information skills instruction and staff development. Importantly, they encouraged collaboration between staff of the library and other agencies, such as the International Students Office and English Department. To support additional-language English speakers, some libraries provided orientations, help desk support or guides in multiple languages (for example, Marcus, 2003; Robertson,1992). Baron and Strout-Dapaz (2001, p. 321) developed a *library skills set* that integrates "language and communication, educational and cultural adjustments" with the American *Information literacy competency standards* (ACRL, 2000). Hughes (2002) considered the application of this approach for an Australian context.

Although strategies reported above respond in practical ways to international students' information-using needs, they have various limitations. In particular, these strategies tend to privilege library and information skills, over critical information using approaches. While information skills are essential building blocks for *using information to learn* (Bruce, 2008), they do not of themselves constitute information literacy. By differentiating international students, these strategies unintentionally tend towards a deficit learning model, whilst lessening students' 'local learning' opportunities. Some initiatives mentioned above, such as multilingual instruction or hand-outs, would be hard to sustain equitably in the Australian context where over 100 principal languages have been noted (Australian Education International, n.d.; OECD, 2004).

Below I consider the key benefits of the various strategies outlined above and draw on recommendations the authors offered for information literacy learning.

Key benefits of the reviewed information literacy strategies

Drawing on recurring recommendations in the literature, I have compiled the following composite set of principles for developing information literacy learning approaches that:

- respond flexibly and empathetically to international students
- are based on identified needs, rather than generalised assumptions
- encourage early, formal and informal, learning opportunities
- respond to interpersonal challenges of online learning
- allow for the diversity of international students' attributes, experiences and needs
- are culturally inclusive
- support a whole learning approach

Some researchers indicate a need to *respond flexibly and empathetically* to international students, on the basis of *identified needs*, rather than generalised assumptions (Hites, 1991; Kflu & Loomba, 1990). Since international students have varied experiences and expectations, it is important to ensure that learning opportunities enable students of all backgrounds to participate confidently in changing and culturally diverse contexts (Baron & Strout-Dapaz, 2001; Battle, 2004; Doherty, 2006; Hites, 1991; Jiao and Onwuegbuzie 2001; Jiao, Onwuegbuzie & Lichtenstein,1996; Liao, Finn & Lu, 2007; Robertson, Line, Jones & Thomas, 2000).

Early formal and informal learning opportunities, and interaction with lecturers and librarians, assist students to develop familiarity with unfamiliar educational practices, whilst library orientations that promote the nature and availability of student services are important to raise awareness and confidence among incoming international students (Baron & Strout-Dapaz, 2001; McKenzie, 1995; Moeckel & Presnell, 1995). Given the increasing emphasis on online learning, it is also important to address inter-personal uncertainties and "troubles" (Doherty, 2006) of learners in culturally diverse *online learning situations* (Appleton & Orr, 2000; Doherty, 2006; Leask, n.d.; McSwiney, 2001; Pincas, 2001).

Student *diversity* offers opportunities for developing inter-personal understandings and international perspectives (Baron & Strout-Dapaz, 2001; DiMartino and Zoe, 2000; Doherty, 2006; Jiao, Onwuebuzie & Lichtenstein,1996). Some researchers point to the benefits of *culturally inclusive approaches* (Biggs, 2003) that allow exposure to different ideas and cultures (McSwiney, 2001).

Some researchers suggest that it is important to consider the affective, cognitive and cultural influences that may impact on individuals' educational experiences (Kuhlthau, 2003; Mehra & Bilal, 2007; Ramsay, Barker, & Jones, 1999; Robertson, Line, Jones & Thomas, 2000). Consequently, the complexity of student needs calls for a *whole learning approach* that encourages students' independent, self-directed learning, through critical information-use (DiMartino and Zoe, 2000; Edwards, 2006; Jackson, 2005; Liao, Finn and Lu, 2007). A *whole* learning approach is curriculum-centred and integrates language learning, information use and academic practices into students' wider learning (Baron & Strout-Dapaz, 2001; DiMartino & Zoe, 1996). It draws on collaborative partnerships between academics, librarians, language and academic advisors, and international student services (DiMartino & Zoe, 2000). A *whole* learning approach is culturally inclusive (Biggs, 2003) and supports students' transition to life and study in the host country. Ideally it enables personal *transformation* (Kettle, 2007) or a sense of being *reborn* (Ryan, 2005) for international students.

Summary and implications: Information literacy learning for international students

The literature outlined in the above section draws attention to three key points which are relevant to this study:

- international students continue to experience a range of information literacy learning needs, despite varied educational strategies
- previous approaches to international students' information literacy learning have tended to differentiate international students
- previous approaches to international students' information literacy learning have tended to focus on specific information skills

These points call for the development of information literacy learning approaches, which respond holistically to international students' information-using experiences and needs. Recommendations from previous research provide useful guidelines for information literacy development. However, as this literature review shows, there is a need to extend the currently limited evidence-base about learning-centred information use, especially among international students.

Conclusion

This chapter has outlined the continuing development of information literacy theory, and examined various practical responses to international students' information-using challenges. In reviewing key research literature, I have identified the need for research to support the development of information literacy learning approaches which respond holistically to international students' needs, and allow for the complex nature of international students' information-using experiences. In this way, the chapter has elaborated the underlying purpose of the study and its theoretical foundation. The following Chapter outlines the research design and explains how the study responds to the research gap identified in Chapters 2 and 3.

4
A Quilt-like Study: Research Design

The two preceding chapters set the scene for the study, identifying gaps in research about international students' use of online information resources and their associated information literacy learning needs. This chapter outlines the research design. First I describe the quilt-like, exploratory and culturally responsive nature of this qualitative study. Then, I outline the *expanded critical incident approach* that underpins the study, indicating how it builds on critical incident technique.

A Qualitative Study

This qualitative study has a quilt-like nature and an exploratory purpose. The research approach evolved gradually, in an emergent manner. My concern with understanding and enhancing aspects of international students' real-life experiences determined the qualitative approach of this study (Denzin & Lincoln 2005; Patton, 1990). Thus the study builds on the understanding that:

> Qualitative research is a situated activity that locates the observer in the world. It consists of a set of interpretive, material practices that make the world visible. These practices transform the world. They turn the world into a series of representations, including field notes, interviews, conversations, photographs, recordings, and memos to the self. At this level, qualitative research involves an interpretive, naturalistic approach to the world. This means that qualitative researchers study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings they bring to them. (Denzin, & Lincoln, 2005, p. 3)

In this section, I present an overview of the research design, and then discuss its quilt-like and exploratory characteristics.

Overview of the research design

The following table 4.1 outlines the research design.

Table 4.1 ***Overview of the research design***

Research elements		Relationship to research questions	Discussed
Research aim	*To investigate how international students use online information resources to learn, and to identify associated information literacy learning needs*.		Chapter 1
Research questions	- *RQ1: How do international students use online information resources to learn?* - *RQ2: What are their associated information literacy learning needs?*		Chapter 1
Research gap	- current knowledge about how international students use online information resources, especially within Australian higher education - an evidence base for developing information literacy learning, to address resource-using challenges experienced by international students	RQ1 RQ2	Chapter 2 Chapter 3
Research Method	*Expanded critical incident approach* - Interviews and observation - Inductive thematic and binary analysis		Chapter 4 (design) Chapter 5 (implementation)
Research Findings	Presented as word picture and condensed set of *critical findings* which reveal: - key features of the international students' experiences of using online information resources to learn - international students' information literacy learning needs associated with using online information resources to learn	RQ1 RQ2	Chapters 6, 7, 8

As the above table shows, this study addresses two inter-related **research gaps** associated with:

- the need for **current** in-depth knowledge about international students' use of information resources for learning - especially in **Australian** higher education
- the need for an **evidence base** for developing information literacy learning that addresses resource-using challenges experienced by international students

These two inter-related research gaps align with the two following research questions:

Research Question 1: How do international students use online information resources to learn?

Research Question 2: What are their associated information literacy learning needs?

In order to carry out the research, I developed and applied an *expanded critical incident approach*, which I introduce later in the chapter. Building upon critical incident technique (Flanagan, 1954), this research approach involved the concurrent data collection, analysis and interpretation process detailed in Chapter 5. The research findings are presented as a nuanced word picture of international students' using online information resources to learn (Chapter 6 and 7) and as a condensed set of *critical findings* (Appendix Q).

A Quilt-like Study

The study is quilt-like in the way that it integrates a variety of concepts and research strategies. In line with qualitative research practice, I sought material for the study in the 'natural setting' (Lincoln & Guba, 1985) of international students' higher education information-learning environment. Like a multi-textured quilt, this study reflects the rich diversity of international students. As with quilt-making, my research approach evolved gradually, in an "emergent" manner (Lincoln & Guba, 1985).

The quilt-like nature of the study resonates with Denzin and Lincoln's (2005, p. 4) concept of qualitative research as 'bricolage'. *Bricolage* in French is associated with DIY (do-it-yourself) and *bric-à-brac.* On a shop sign in a French village, *bricolage* indicates hardware, often with a mix of second-hand goods. A *bricoleur/bricoleuse* is a person who fixes things, who brings bits and pieces together, sometimes in a planned way, sometimes by tinkering intuitively. The qualitative researcher can be seen as a '*bricoleur* and quilt maker', one who brings together different concepts and strategies. Kincheloe (2001, p. 687) explains:

> Sensitive to complexity, bricoleurs use multiple methods to uncover new insights, expand and modify old principles, and reexamine accepted interpretations in unanticipated contexts. Using any methods necessary to gain new perspectives on objects of inquiry, bricoleurs employ the principle of difference not only in research methods but in cross-cultural analysis.

Denzin and Lincoln (2005, p. 4) suggest that there are many kinds of *bricoleurs* – "interpretive, narrative, theoretical, political, methodological". There are elements of the methodological and the interpretive *bricoleur* in my approach. The methodological *bricoleur* "is adept at performing a large number of diverse tasks, ranging from interviewing to intensive self-reflection and introspection" (Denzin &

Lincoln, 2005, p. 6). Meanwhile, the interpretive bricoleur produces:

> a complex, quiltlike bricolage, a reflexive collage or montage – a set of fluid, inter-connected images and representations. This interpretive structure is like a quilt, a performance text, a series of representations connecting the parts to the whole.

My father (a businessman) was a natural *bricoleur.* He used to pick up stray washers and salvage the components of discarded gadgets. He would sort, label and store his findings for future re-use. He could fix just about anything with his bits and pieces. While he was clever with his hands, his real success as a *bricoleur* related to his ability to recognise the potential of disparate bits and then make the creative connections, to revive some items and reform others. In this study I followed a similar *inductive* process (Lincoln & Guba, 1985).

Becker (1998, p. 2) proposes that the *bricoleur* makes use of whatever strategies, methods and empirical materials are at hand. Furthermore, “if the researcher needs to invent, or piece together, new tools, or techniques, he or she will do so” (Denzin & Lincoln, 2005, p. 4). I demonstrate these practices in developing and implementing the *expanded critical incident approach* of this study. This approach integrates a variety of concepts and research strategies, giving the study a certain *inter-disciplinarity* (Kincheloe, 2001).

Methodologically, the study draws on a variety of research methods: it builds on critical incident technique (Flanagan, 1954), and is supported by principles of action research (Carr & Kemmis, 1986; Zuber-Skerritt,1996) and grounded theory (Glaser, 1998). The quilt-making research process was sometimes measured, sometimes trial and error, in the way that I adopted a variety of qualitative research strategies (Ezzy, 2002; Flick, 2002; Lincoln & Guba, 1985; Patton, 1990). This approach enabled me to interact directly with the participant students and the data. I gathered data through semi-structured interviews and observations, which offered a variety of perspectives and triangulation. In a manner akin to grounded theory (Glaser, 1998), I carried out data collection and analysis concurrently. This involved a continuous gathering, sifting and sorting of the data, seeking further pieces as loose ends and gaps became apparent in the quilt.

Ezzy (2002) claims that “writing is as much about creating ‘results’ as it is about reporting them” (p.138). As an interpretive *bricoleuse*, I set out to create a quilt-like

word picture, which incorporates many ‘pieces’ in the form of international student narratives, researcher observations, and documentary evidence. The pieces are of varying shapes, colours and textures, which reflect the diversity of the international students and their information literacy learning experiences. *Critical incidents* represent the threads that draw the pieces together into a whole. The various pieces are significant in their own right, yet they fit together to form a nuanced view of the international students’ experiences of using online resources to learn.

The word picture situates the students in their culturally diverse information-learning environment and shows them actively using online resources. It features their affective and reflective responses to using resources, as well as the cultural and linguistic dimensions of their resource-using experiences. The details appear variously as tabulated information, vignettes, thematic narrative and conceptual models. A set of *critical findings* summarise the international students’ information literacy learning needs. A suite of models – like *mini quilts* – represent the conceptual outcomes of the study.

An exploratory Study

Various metaphors are applied to research, and frequently the research process is portrayed as a journey of exploration (Kvale, 1996; Patton, 1990). This study also has involved exploration and discovery, with the journey taking the form of a series of forays rather than a staged, sequential progression.

Exploration involves a journey into the unknown, while discovery enables the creation of a map. As a map to this study, I developed, and frequently updated the *research framework,* which is introduced in Chapter 5 (Table 5.6). Although I defined the aim of the study early*,* other elements of the research design emerged gradually (Lincoln & Guba, 1985). Consequently, I filled in, added and revised elements of the *research framework* as I went along. As a working tool, the *framework* acted as a guide, bringing me back to the aim and suggesting areas for further development, as I moved between various research phases (data collection, analysis, interpretation). The final version of the *research framework*, represents a map of the study. It charts where I have been and helps explain the journey to others. It also supports others wishing to make a similar research journey, showing key methodological points along the way.

As I describe here, the exploratory nature of the research is evident in several ways. In seeking understandings about international students' resource-using experiences, I was a traveller seeking to discover the unknown, rather than to uncover the known or expected (Kvale, 1996). Rather than set out with a hypothesis or proposition, I set my research direction with open-ended research questions, which asked how the international students used resources and what were their information literacy learning needs. Similarly, for data collection I conducted semi-structured interviews with open-ended questions, in order to "obtain descriptions of the life world of the interviewee with respect to interpreting the meaning of the described phenomena" (Kvale, 1996, pp. 5-6).

The study also involved methodological exploration. I started with critical incident technique (CIT) (Flanagan, 1954), which gradually evolved into an *expanded critical incident approach.* The "emergent" nature (Lincoln & Guba, 1985) of the *expanded critical incident approach* allowed the flexibility and the means to pursue fresh leads as they arose. As described in the following section, I explored both what CIT offered as a research method, and where it could take the study.

A trustworthy study

To ensure the integrity and trustworthiness of this study, I drew on the principles of the *naturalistic* paradigm (Lincoln and Guba, 1985). Thus, the design and implementation of the study are underpinned by notions of *credibility, transferability, dependability* and *confirmability*, which Lincoln and Guba proposed were more appropriate for qualitative research than the traditional measures of quantitative research (internal and external validity, reliability, objectivity). Moreover, I considered that Lincoln and Guba's (1985) *trustworthiness* criteria more closely addressed the complexity of international students' resource-using experiences, compared with other CIT-specific behaviour-oriented criteria (for example, Butterfield, Borgen, Amundson, & Maglio, 2005). At the end of Chapter 5, I demonstrate the application of the *naturalistic* principles to the study.

A Culturally Responsive Study

The cultural and linguistic diversity of the international student participants both enriched and added complexity to the research. In all aspects of the study I was sensitive to cultural dimensions inherent in my interactions with the students and my

interpretation of their responses. This section describes how I addressed particular challenges in capturing the essence of the students' experiences, whilst striving to remain free of generalisations.

As mentioned in Chapter 2, there is a tendency sometimes to generalise international students' experiences, with an emphasis on difficulties and differences. Given the exploratory nature of this study, I needed to retain an open mind to the nature of the students' resource-using experiences. The research questions were helpful in this respect. Their open-ended format allowed me to gain data about international students' experiences from a variety of perspectives, rather than pursue pre-determined assumptions.

As a result of the literature review (Chapters 2 and 3), my own experiences (Hughes, 2008) and early data collection and analysis, I had developed an inclusive, nuanced view of international students' experiences that guided my subsequent research approach. In particular, I saw the participants as members of a student population that reflects the social and cultural diversity of Australian society, rather than as members of a separate international student population. Notably also, I understood *culture* and *language* to be part of the changing fabric of each students' experience, rather than discrete characteristics. This way of viewing international students' experiences emphasises variations and challenges, rather than differences and difficulties. It acknowledges the real and varied challenges that international students may encounter, without privileging negative aspects. Thus, I regard cultural and linguistic variations as enriching elements of the students' experience, rather than as problems. Challenges suggest learning opportunities rather than deficits.

Mindful of these variations and challenges, I sought to establish a relationship of mutual respect with international students during data collection interviews. It also underpinned my approach to data analysis, whereby I identified a range of *interactions* and *responses* pertaining to internationals students' learning-related information use. These findings are integrated into a multifaceted word picture of international students. Importantly, the findings highlight the students' strengths, whilst identifying information literacy learning needs. By representing international students as members of the wider, culturally diverse student population, the findings promote inclusive approaches to information literacy learning.

My interactions with the international students were based on the premise that well developed inter-personal awareness and communication is essential for any research involving human participants. Moreover, the principles of ethical research remain constant, irrespective of participants' or researchers' backgrounds. Therefore, my approach drew on methodologies of qualitative research (Denzin & Lincoln, 2005; Patton, 1990), as well as cross-cultural research (Ember & Ember, 2001; Lonner & Berry, 1986). I anticipated marked variations, both in the students' educational experiences and in their familiarity with the research process. Consequently, I carefully explained the purpose of the research and the nature of their involvement, stressing the voluntary, confidential nature of their participation.

Cultural and linguistic considerations came to the fore during data collection and analysis. For example, data collection interviews called for inter-personal sensitivity and flexibility, since they were the point of contact between myself (as researcher) and the participant students. I was guided by McSwiney's (1995) and Doherty's (2006) research experience with international students, taking care to demonstrate my integrity to the students, by fostering mutual respect and clear, open communication between us. I was alert to social uncertainties and possible points of tension relating to gender, relative status and face-saving.

In my interactions with the international students I was alert to social and linguistic uncertainties. I came to realise that they may be expressed in many ways, depending on the individual and the circumstances. There were significant linguistic variations among the students and most spoke English as an additional language. During the interviews, I watched for mutual misunderstandings between myself and the students. Points of confusion included: unfamiliar vocabulary and colloquial styles; unfamiliar accents; unfamiliar non-verbal responses. As Patton (1990, p. 337) comments:

> The data from interviews are words. It is tricky enough to be sure what a person means when using a common language, but words can take on a very different meaning in other cultures.

For example, in one interview I unthinkingly used a colloquial phrase that is quite common in Australia. As a probing question about the outcome of an information search, I asked a student: "how did you go?" My intended meaning was: "what were the results like?" However the student, who was evidently (and understandably) unfamiliar with this idiom, replied that she caught the bus to university. Consequently, I took care to use straightforward, jargon-free language in all written

and verbal communication, including information sheets, consent forms and interview questions. In interviews I frequently repeated and rephrased questions, often allowing lengthy pauses for students to articulate a response. To further ease communication, I included an online task to complement the verbal questions, allowing the students to demonstrate practical aspects without the need for technical (information science) vocabulary.

Linguistic variations also caused some challenges for data analysis. In transcribing interviews I needed to develop a close familiarity with individual students' speech patterns, often listening repeatedly to particular interview portions to recognise particular phrases or to gain the general gist. When examining the transcripts and categorising the data, I needed to carefully determine the intended meanings of less usual grammatical patterns and expressions. In order to minimise inaccurate interpretations, I omitted some responses which were expressed in such a way to be ambiguous or only partially unintelligible.

At times I found the 'fresh ears' of a colleague helpful for clarifying particular expressions or pronunciations. My own experiences (Hughes 2008) as a language learner, international student and educator also proved significant reference points, both in my interactions with the students and in analysing their verbal responses to the interview questions. Sometimes I shared aspects of my experiences as an international student with participants. Other times, my own experiences provided insight into students' experiences of living and learning outside their home country. In this way, my experiences enabled me to establish rapport with the students and to recognise telling details in their narrative. Moreover, my experiences as a language learner and translator contributed sensitivity to different language patterns, assisting me to recognise (even 'feel') intended meanings.

During this study I continued to develop understandings and practices relating to culturally diverse environments. For example, when presenting my project plan to fellow higher degree students in a research methodology class, I became aware that I was unintentionally projecting patronising and generalised perceptions about international students – to an audience that included many high achieving international students. That occasion raised my awareness about inclusive perspectives and language.

Through this study I seek to promote understandings about the diversity and individuality of international students. I draw on student narrative and vignettes, to reflect real experiences of using online resources in a culturally diverse learning environment. As discussed in Chapter 8, I intend that the findings will support the development of inclusive reflective approaches to information literacy learning, for international and domestic students alike.

Towards an Expanded Critical Incident Approach

Qualitative research is responsive to uncertainties and emerging trends in human experience. Similarly, the shape of this study evolved gradually with the emergent data and my developing conceptual understandings. Starting as a relatively straight forward investigation into international student's use of online resources, the study became a broader exploration of international students' experiences of using online information resources to learn. Consequently, the research focus widened: from the resources themselves and specific information skills, to the whole experience of using online information resources to learn. The need to develop a suitably expansive research approach prompted the methodological exploration that I describe in this section.

Initially, in this study I set out to identify difficulties experienced by international students in their use of online resources, by means of the critical incident technique (CIT) (Flanagan, 1954). CIT seemed suitable for the study, since Flanagan had devised this approach for gathering and analysing data about specific human activities in real-life situations. Applied to this study, CIT offered a way of investigating international students engaged in the *activity* of using online resources in their current higher education context. Early data collection and analysis proved quite fruitful. CIT enabled me to identify various difficulties - and strengths - experienced by international students in using resources. Gradually, however, I became aware of a number of limitations, both in the scope of my study, and in the method I was using.

On a methodological level, the semi-structured interviews were producing a wealth of data (explanations, affective and reflective responses, cultural dimensions) that were not accommodated by CIT's tight analytical approach that is based on binary categorisation. CIT's strength lies in evaluating behaviours associated with particular

activities. While CIT proved a useful tool for recording and categorising the students' resource using 'actions', it was less adequate for analysing the nuances of students' affective and reflective responses and cultural and linguistic dimensions. As a result, I became concerned that my findings might promote stereotypical understandings about international students and a deficit model, skills-oriented responses to their information literacy learning needs.

On a conceptual level, I sought to represent *using online resources* as part of the wider experience of *using information for learning* (Bruce, 1997). However, I found CIT was forcing a focus on resource use as behaviour or skill. Unlike other qualitative methods, such as grounded theory (Glaser, 1998) or phenomenography (Marton, 1986), CIT lacked theoretical underpinning or strategies to support conceptual development. Seeking to strengthen the methodological and theoretical basis of the study, I began to consider alternative research approaches, including action research, case study, grounded theory and phenomenography. Each approach had positive features, although none fully met my research needs.

Action research (Carr & Kemmis, 1986; Zuber-Skerritt, 1996) offered several benefits for this study, which included its socially engaged approach, a focus on transformative outcomes, especially in educational settings, and emphasis on reflective practice. As Carr and Kemmis (1986, p.162) state:

> Action research is simply a form of self-reflective enquiry undertaken by participants in social situations in order to improve the rationality and justice of their own practices, their understanding of these practices, and the situations in which the practices are carried out.

My long-term intention, to enhance students' information literacy learning outcomes, aligned with action research principles. However, I realised that the exploratory nature and timeframe of this study would not allow the participatory involvement with participants, an essential aspect of action research.

Case study method (Yin, 2003) offered the potential to combine and compare data of varying types and sources, and to involve participants from multiple real-life sites. However, case study's structured approach seemed likely to constrain the expansive research approach I was considering. In particular, the practice of designing case study around an initial proposition, and generalising findings to

theory, were antithetical to my intention for an open-ended exploratory study that seeks new understandings based on individual experiences.

The emergent nature of grounded theory seemed to meet my need for an exploratory research approach that relates human activity and context, and accepts multiple types of data. I was attracted by the autonomy it offers researchers to follow leads and develop theory: the researcher “need only see what incidents come his way as more ‘data’ to constantly compare, to generate concepts and to induce the patterns involved” (Glaser, 1998, p. 8). It also offers the kind of “package” (Glaser, 1998, p. 12) for progressing through the whole research process that I found lacking in CIT. However, it would not have been possible to ‘convert’ mid-way. Grounded theory needs to start with a blank slate, using the emerging data to generate theory, whereas I had already conducted a literature review, identified key theory and begun data collection and analysis.

Phenomenography is significant to this research approach since it gives life to the concepts of *information literacy, using information,* and *informed learning* that underpin it (Bruce, 1997; Bruce, 2008; Lupton 2004; 2008). Phenomenography offers a qualitative research method for “mapping the qualitatively different ways in which people experience, conceptualize, perceive, and understand various aspects of, and phenomena in, the world around them” (Marton 1986 p.31). However, as with grounded theory, it was not feasible to adapt the existing study from CIT to phenomenography. The quilt-like combination of concepts and strategies that I was developing would not mesh with the seamless phenomenographic approach, which integrates theory, method, outcome space and learning theory. While a phenomenographic study represents the ways in which people *experience* a particular phenomenon, such as searching the internet (Edwards, 2006), I sought to investigate how students *actively use* online information resources. Moreover, phenomenographic findings are collective, separating the participants from the research outcomes, whereas I was interested in exploring the individuality and diversity of international students and their experiences.

Eventually, I decided against abandoning CIT, in favour of exploring where CIT could take this research. Having already made some progress with CIT, I was aware of its capacity for data collection and analysis. I gradually moved from ‘straight’ CIT to an *expanded critical incident approach.* I built the expanded approach on CIT, whilst integrating principles of grounded theory and action research.

Action research (Carr & Kemmis,1986; Zuber-Skerritt, 1996) advised the reflective and iterative elements of the e*xpanded critical incident approach*. The *Action research model for learning to search the Internet* (Edwards & Bruce, 2002) supported the data analysis framework. The recommendations of this study promote an *inclusive informed learning approach*, which integrates reflection. My long-term intention, to enhance students' information literacy learning outcomes, aligns with action research principles for social improvement. As researcher, I follow an active-reflective practice akin to the action research cycle.

The influence of grounded theory (Glaser, 1998) is evident in the emergent nature of the e*xpanded critical incident approach*. I followed a process of concurrent data collection, analysis and interpretation. Writing became part of my interpretive process "through which the theoretical implications of data collection and analysis are worked out more fully, though never completely" (Ezzy, 2002, p. 138). In this way I gradually created a word picture of the students' resource-using experiences, as well as a set of *critical findings* that summarise information literacy learning needs.

Conceptually, information literacy theory provided the overarching concept, which is *using information (resources) to learn as a multifaceted experience* (Bruce, 1997; Bruce, 2008; Lupton, 2004a; 2008). In addition, I drew on *contributing concepts* from information behaviour research, specifically: Kuhlthau's (2004, p. 206) notion of a holistic information search process as an *interplay* of thoughts, feelings and actions in information seeking; and Wilson's (1997) *context of information need*.

The *expanded critical incident approach* allowed greater scope to inter-relate various aspects of the students' experiences. It enabled me to situate students' resource use within their information-learning environment, and to relate their resource-using actions (or *interactions*) with their associated affective and reflective responses, and cultural and linguistic dimensions. The developing word picture reflected the students' diversity, strengths and learning needs. It allowed the presentation of detailed findings whilst giving voice to individual perspectives.

Introducing the Expanded Critical Incident Approach

The preceding sections described the qualitative characteristics of the study. This section outlines its methodological framework. I introduce the *expanded critical incident approach* and explain how it builds upon critical incident technique (Flanagan, 1954). To achieve this, I first provide an overview of critical incident technique (CIT), and then outline my reasons for incorporating (CIT) into this research approach. Next I introduce the five phases of the *expanded critical incident approach.* I explain *points of expansion*, or the ways in which I have modified CIT in developing the *expanded critical incident approach.*

Overview of critical incident technique

Critical incident technique (CIT) was developed in the nineteen forties by John Flanagan, an American researcher in the field of occupational psychology (Flanagan, 1954). CIT was initially intended for US military use during World War II. Early CIT studies were concerned with combat leadership, pilot disorientation and bombing raid failures. They enabled the identification of effective and ineffective pilot behaviours and provided a practical basis for future pilot selection and training (Flanagan, 1954). Following the war, Flanagan established the American Institutes for Research (AIR), with the aim of applying scientific approaches to the study of human behaviour in industry (American Institutes for Research n.d. a; n.d. b). Over the following three decades Flanagan and his AIR associates extended the scope of CIT to the fields of personnel management (especially job performance and leadership), education, health and community services.

CIT's original emphasis on human behaviour reflects the positivist research paradigm prevailing at the time (Chell, 1998). Flanagan (1954, p.355) stressed the "scientific" validity of CIT and its relatively high levels of objectivity, stating that: "the critical incident technique, rather than collecting opinions, hunches and estimates, obtains a record of specific behaviors from those in the best position to make the necessary observations and evaluations". Significantly however, Flanagan regarded CIT as a "flexible set of principles which must be modified and adapted to meet the specific situation at hand" (Flanagan, 1954, p. 335).

Critical incident technique (CIT) draws on people's first-hand accounts to build a picture of human activity in real-life settings. It "encourages participants to tell their

story" (Urquhart et al., 2003), by recalling *critical incidents* – or significant instances of a particular activity, which that they have either carried out themselves or observed someone else carrying out.

CIT is a practical investigative tool, rather than a theoretically based method. As described by its creator John Flanagan (1954, p. 327), CIT offers:

> A set of procedures for collecting direct observations of human behavior in such a way as to facilitate their potential usefulness in solving practical problems and developing broad psychological principles. The critical incident technique outlines procedures for collecting observed incidents having special significance and meeting systematically defined criteria.

Recently, CIT has been described as:

> a well-established qualitative research tool … It is a flexible set of principles that can be modified and adapted to meet the specific situation at hand. By gathering factual reports made by observers, researchers can build a picture of the situation under study. The CIT maximizes the positive and minimizes the negative attributes of anecdotes, effectively turning anecdotes into data. (FitzGerald, Seale, Kerins, & McElvaney, 2008)

Traditionally, CIT identifies effective or ineffective behaviours (Flanagan, 1954). CIT may also be used to identify characteristics that define - or factors that contribute to - successful or unsuccessful outcomes of an activity or event (Chell, 1998; Ellinger, & Watkins 1998). CIT findings provide a basis for performance evaluation, program development, problem-solving, theory building and further research (Fivars, 1980; Flanagan, 1954; Kain, 2004; Woolsey, 1986).

Defining 'critical incident'

In general usage, a *critical incident* often implies an accident, major crisis or turning point, such as the 9/11 Twin Towers disaster in New York or the Boxing Day tsunami of 2004. Critical incidents also may be catalysts for discovery and innovation. For example, the discovery of penicillin resulted from Alexander Fleming's chance encounter with unwashed petri dishes. Similarly in 1912, when pioneer aviator Lieutenant Wilfred Parke intuitively reversed control of his avro biplane during a spin, he averted a fatal crash (Berriman, 1912). His *critical incident* changed pilot practice and has had a lasting impact on aviation safety

Real life incidents also provide the focus for CIT studies, although the nature of the incidents need not be as dramatic as those experienced by Fleming or Parke. For

CIT, critical incidents relate to a particular activity being investigated. According to Flanagan (1954, p. 338):

> an incident is critical if it makes a 'significant' contribution, either positively or negatively to the general aim of the activity' and it should be capable of being critiqued or analysed.

Typically, CIT participants are asked to think of a significant instance (*critical incident*) of a particular activity that they have either carried out or observed. Examples include: foremanship (Flanagan, 1954), interpreting (Johnson, & Sussman, 1992) and library reference encounters (Radford, 1996). They then need to describe particular aspects (generally positive and negative) of the incident.

Five-step process of critical incident technique

CIT involves a systematic process of five steps, which were specified by Flanagan (1954) as follows:

- *Step 1 - Establish the general aims*:
  The first CIT step involves defining the *activity* to be studied and establishing the *aim* of the activity. This step provides direction for the data collection, analysis and interpretation. Flanagan recommends consulting experts in the field to assist with determining the *activity* and its *aim*.

- *Step 2 - Establish plans and specifications*:
  This step involves developing a detailed and defensible plan of attack for data collection. It determines participant recruitment and the nature of the *critical incident*s to be collected.

- *Step 3 - Collect the data:*
  This step involves collecting data in the form of critical incidents, relating to the activity being studied. Participants generally describe particular instances – or *critical incidents* – that exemplify positive and negative aspects of the activity. Flanagan provided detailed instructions concerning interview protocols, required sample size and composition of the questions. He suggested that data collection and analysis should be carried out concurrently. Incidents should continue to be collected until redundancy occurs – that is, when no new *critical behaviours* appear.

- *Step 4 - Analyse the data*:
  This step involves an inductive data analysis process for classifying critical incidents, generally on a binary (positive/negative) basis. Critical incidents are arranged into a series of mutually exclusive categories and sub-categories, of decreasing generalisability and increasing specificity. Typically, this process leads to the identification of a set of *critical behaviours* that indicate effective (or ineffective) ways of carrying out the activity.

- *Step 5 - Interpret and report the data:*
  This step involves interpreting and reporting the data, in line with the intended application of the findings. CIT does not require a specific report format or specify how the findings might be applied. As Flanagan states: “It should be emphasized that critical incidents represent only raw data and do not automatically provide solutions to problems” (p. 355).

An example of CIT in practice

When investigating collaborative teamwork, Kain (1997) invited teachers to “think of a time when you and your team members were especially effective in working together to create an integrated … unit for your students”. He then asked the teachers to describe what the team did to create the activity, what helped them accomplish this purpose, the roles the team members took, and how the team interacted with the rest of the school. Kain then asked them to describe a similar, but unsuccessful, collaborative attempt. These instances of collaborative teamwork represented the *critical incidents* of the study.

Kain followed an inductive data analysis process, whereby he identified three levels of categories, relating to positive and negative incidents. His findings indicated that contributors to successful teacher collaboration include: giving own time to task; talking to one another; and division of labour. Obstacles to collaboration included: lack of planning time; poor team composition; and school “traditions” (practices). Based on these findings, Kain developed a series of recommendations that included: the need for administrators to provide support, especially time, for collaborative undertakings; and for teams to develop a framework for thinking about interdisciplinary instruction.

Ongoing development of critical incident technique

Over the fifty years since its inception, CIT has proved flexible to changing research approaches, allowing researchers to modify the method in various ways to suit particular investigative needs (Ellinger, & Watkins,1998; Shirey, n.d; Woolsey,1986). Some researchers have widened CIT perspectives from purely behavioural concerns to wider aspects of human experience (Chell,1998; Kain, 2004). More recently, CIT findings provide insight about why people engage in activities, as Kain (2004, p.85) states:

> People assign meanings to their experiences, and when we group together collections of such meanings in order to make sense of the world, we engage in a kind of research, a seeking of understanding. The critical incident technique provides a systematic means for gathering the significances others attach to events, analyzing the emerging patterns, and laying out tentative conclusions for the reader's consideration.

Moreover, some researchers are finding useful compatibilities between CIT and other research methods, such as case study (MacIntosh-Murrray, 2003; Thomas, 1996), explicitation (Urquhart et al., 2003) and grounded theory (Chell,1998). Ellinger (Ellinger & Watkins, 1998) incorporated a constructivist approach into her CIT study, enabling her to look at beliefs, attributions, filters and contexts that shaped managers' roles as learning facilitators.The JUSTEIS project (Armstrong et. al., 2000; Armstrong et al., 2001) combined critical incident technique and critical success factors in its survey instrument.

Why critical incident technique?

Critical incident technique (CIT) provides an investigative focus for the study and supports data analysis. As outlined below, CIT offers a range of benefits, which include its real-life orientation, as well as its efficacy for exploratory research, its flexibility, and its proven, practical approach. In addition, CIT has been applied effectively in the education and information science disciplines.

First, CIT's emphasis on real-life activity coincides with my aim to explore international students' experiences of *using online resources.* Critical incidents represent the unifying threads of the *expanded critical incident approach.* Previous studies (for example, Ellinger & Watkins, 1998; Kain, 1997; Radford, 1996, 2006) show that CIT lends itself to exploratory research. Critical incidents provide a powerful research focus on real events of significance to the participants. They can prompt participant recall and bring immediacy and authenticity (Ellinger & Watkins,

1998). Thus, CIT is capable of yielding rich, contextualized data that reflect real-life experiences and illuminate 'shared reality' (Kain, 2004, p. 82).

Second, CIT offers a practical approach to data collection and analysis, with clearly defined guidelines. According to Christie and Young (1995, p.7), CIT is "grounded…in common sense procedures". As Chell (1998, p.68) states, CIT interviews allow 'linkage between context, strategy and outcomes'. CIT is able to manage large amounts of qualitative data, and it assists the identification of broad patterns and understandings (Chell,1998).

Third, CIT is well proven as an exploratory and investigative tool (Chell 1998; Ellinger & Watkins, 1998; Woolsey, 1986). Its reliability and validity were tested and deemed satisfactory by and Nilsson (1964) and Ronan and Latham (1974). More recently, psychology researchers at University of British Columbia have developed a series of credibility checks for CIT, which they consider are consistent with Flanagan's intent and demonstrate the robustness of CIT findings (Butterfield, Borgen, Amundson & Maglio, 2005).

While CIT has been most widely used in organisational psychology (Anderson and Wilson 1997), it has also been used for numerous studies across social science disciplines (Butterfield, Borgen, Amundson & Maglio, 2005). Examples include:

- psychology and counselling: Amundson and Borgen (1987); Cohen and Smith (1976); Neely (1989); Woolsey (1986)
- human resource development: Chell (1998); Ellinger and Watkins (1998)
- communication: Query and Wright (2003); Stano (1983)

Importantly, CIT has proved a successful research method within the disciplinary areas of this study, Education and Information Science. As early as 1954, Corbally (p. 61) identified the value of CIT for educational research, especially for evaluating behaviours and competency in the areas of "teaching and administrative competency". Subsequently, CIT has supported significant studies in Education, including: Hesse (1996), Kain (1997), LeMare and Sohbat (2002), Redmann, Stitt-Gohdes and Lambrecht (2000), Schmelzer, Schmelzer, Figler and Brozo (1987),Tripp (1993). CIT's applicability to Library and Information Science is attested by Fisher and Oulton (1999, p.124):

> The technique has much potential value for researchers in library and information management in, for example, studies of the professional-client interface; understanding organisational cultures and management styles; and, of course, identifying real training needs.

As the *Encyclopedia of Library and Information Science* notes, CIT "can provide information that is objective as well as valid and is a tool of great potential for the researcher interested in the human element of the information problem" (Shirey, n.d, p. 291). Information science studies using CIT include:

- Library user studies: Andrews (1991a; 1991b); Armstrong et al. (2000; 2001); Radford (1996; 2006); Slater & Fisher (1969); Sullivan-Windle (1993)
- Library systems and online searching behaviour: Tonta (1992) ; Wilson, Starr-Schneidkraut & Cooper (1989); Wilkins & Leckie (1997)
- Library management and human resources (Fisher & Oulton (1999)

Fourth, CIT supports educational outcomes and research. Critical incidents provide stimuli for learning and reflection (Chell, 1998; Christie, & Young, 1995; Tripp, 1993). Thus, CIT meets my intention to identify and address information literacy learning needs. It supports the reflective information literacy approach that I recommend in Chapter 8. As Woolsey (1986) points out, CIT can open up new research avenues. CIT findings identify research issues, and provide a knowledge-base for further investigation and conceptual modelling.

Fifth, CIT is modifiable. For example, Chell (1998, p. 68) indicates that in addition to behaviours, CIT might consider individual perspectives and affective responses: "the conscious reflections of the incumbent, their frame of reference, feelings, attitudes and perspective on matters which are of critical importance to them". In addition, she includes "culture" among "overarching concepts" that might be studied:

> The unit of analysis may be the individual, the group or the team, but the CIT allows for the focus to shift, for example to the organization, the industrial sector or the location – region or community, country or nation. Thus, for example, one may explore overarching concepts like 'climate', 'culture, 'style', etc. by examining the categorical data across the sample as a whole. (Chell, 1998, p. 60)

The following section introduces the research approach that I developed during the methodological exploration described previously.

From critical incident technique to expanded critical incident approach

The *expanded critical incident approach* (ECIA), which I developed for this study, incorporates five inter-related *phases: Planning, Collection, Analysis, Interpretation* and *Reflection. As the* following Table 4.2 shows, these five phases align broadly with the five steps of critical incident technique (Flanagan, 1954). However, the ECIA *Planning* phase incorporates CIT Steps 1 and 2 and adds a Reflection phase[3].

Table 4.2 Comparison of CIT's five steps and the five phases of the expanded critical incident approach

Five Steps ***Critical incident technique (CIT)*** **(Flanagan 1954)**	**Five Phases** ***Expanded critical incident approach (ECIA)***
Step 1: Establish the general aims	Planning
Step 2: Establish plans and specifications	
Step 3: Collect the data	Collection
Step 4: Analyze the data	Analysis
Step 5: Interpret and report the data	Interpretation
	Reflection

Points of expansion

The critical incident technique (CIT) and expanded critical incident approach (ECIA) share a common concern with real-life experiences, and both focus on *critical incidents*. However, there are four notable differences - or *points of expansion* - between CIT and ECIA, as outlined below.

First, CIT offers a practical investigative technique, whereas ECIA aims to provide a holistic research approach. While CIT's five steps concentrate on data collection, analysis and interpretation procedures <u>within a study</u>, the five phases of ECIA encompass <u>the whole study</u>. For example, CIT Step 1: *Establish the general aims* relates specifically to the *aim of the activity* being studied. In contrast, the ECIA Planning phase in this study involved determining the overall *research aim,* as well as identifying the more specific *aim of the activity.* Thus I defined the research aim, which provided direction for the whole study, as:

[3] The change from the verbs used to name the CIT steps to the nouns used to name the ECIA phases was made in order to differentiate the two approaches; there are no semantic or conceptual implications in the change.

To investigate how international students use online information resources to learn, and to identify associated information literacy learning needs.
I defined the aim of the activity, which provided a focus for data collection and analysis in this study, as:
Using online information resources

Planning and Reflection are integral to, and inform, the ECIA approach. For example, the merging of CIT Steps 1 and 2 into ECIA's Planning phase indicate an essential inter-relationship between *aim* and *plan*. Moreover, ECIA involves continuous backwards and forwards reflection, 'in-action', 'on action' (Schön, 1987). In this way, Planning and Reflection play a similar role in ECIA, as in action research (Carr & Kemmis, 1986; Zuber-Skerritt, 1996).

CIT is simply an investigative tool, whilst ECIA supports the development of a theoretically-based research design. Thus, the study integrates information literacy theory, select information behaviour concepts, and principles of action research and grounded theory.

Second, CIT steps are sequential while ECIA phases are inter-connected and iterative. In Figure 4.1 below, the points of the star represent the five phases of the *expanded critical incident approach*. The straight lines around and across the star show multiple connections across all five phases.

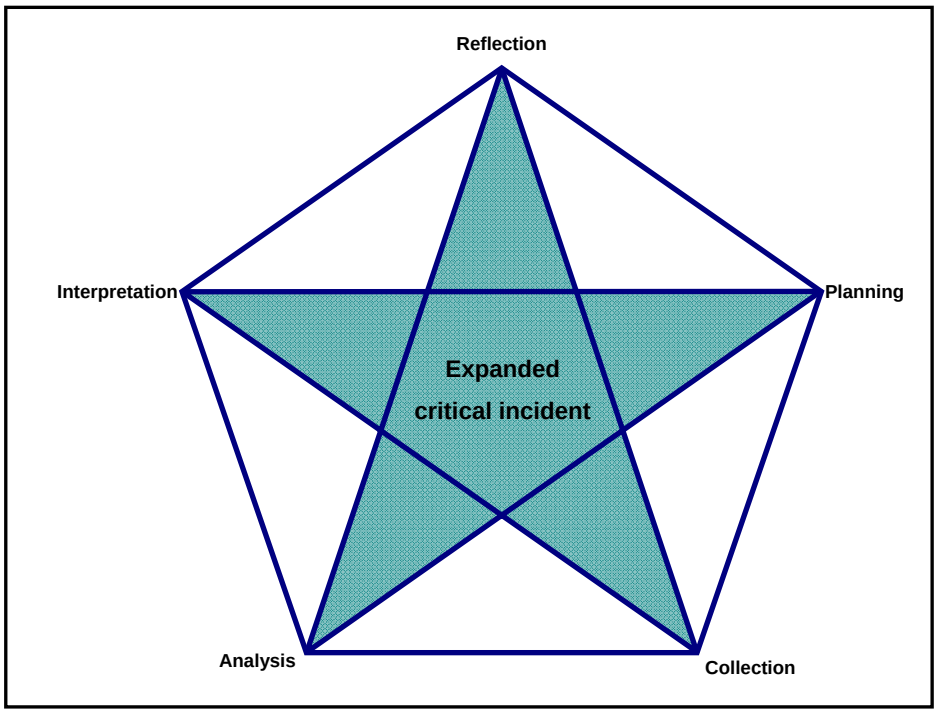

Figure 4.1 Five phases of the expanded critical incident approach

[The model's form was suggested by Fogarty et al.'s (2005) *Clinically integrated system]*

In the above figure, the lines indicate a continuous, iterative progression back and forth between the different phases, as data emerge, new understandings develop and further research needs become apparent. For example, in this study, on identifying a new theme emerging in the data [Analysis], I considered its possible implication within the context of the study [Reflection, interpretation]. As a result, I then undertook further Planning, Reflection and Data Collection and Analysis around this emergent theme. This iterative approach, ECIA reflects the influence of grounded theory (Glaser, 1998) and action research (Carr & Kemmis 1986; Zuber-Skerritt, 1996).

Third, ECIA marks a shift of emphasis, from participant behaviours to human experiences. For example, a CIT study about international students using online information resources would concentrate on <u>what</u> resources they used and <u>how</u> they used them. In contrast, this ECIA study considers the students' whole information-using experience, by integrating their interactions with online resources, their

learning context, their affective and reflective responses to using online resources, and the cultural-linguistic dimensions of their resource-using experiences.

Fourth, CIT data analysis is limited to binary categorisation, while ECIA allows multiple approaches. Thus, CIT analysis generally aims to identify positive and negative behaviours, whilst this study sought wider insights about international students' resource-using experiences through binary and thematic categorisation. CIT findings are generally limited to sets of *critical behaviours*, while this study creates a nuanced word picture of international students' learning-related resource use, in addition to a set of *critical findings* about their information literacy learning needs.

Conclusion

Chapter 4 has outlined the qualitative research design, highlighting the quilt-like nature and exploratory purpose of the study, and its response to the challenges of researching in a culturally diverse context. In addition I have described the development and key features of the *expanded critical incident approach*, which underpins the study. The following Chapter describes the practical implementation of the research design.

5
Implementing the Expanded Critical Incident Approach

This chapter shows the *expanded critical incident approach* in practice. I describe how in this study I implemented each of the five phases outlined in Chapter 4: *Planning, Collection, Analysis, Interpretation, Reflection*. I also draw on naturalistic principles to demonstrate the trustworthiness of the study and its findings.

Planning Phase

Planning is a constant aspect of the *expanded critical incident approach.* It determines the overall direction of the research, as well as particular strategies within each phase. In this section, I outline the study's overall plan and timeframe, as well as detailed specifications for the data collection.

Overall research plan

As explained in Chapter 4, this research involved a continuous process of development, implementation, review and revision. The study comprised four main parts: Initial Planning Stage, Pilot Study, Stage One and Stage 2. The Pilot Study and Stage One were carried out at Central Queensland University Brisbane International Campus (CQU-BIC) while Stage Two was carried out at Queensland University of Technology (QUT). The data from all three parts were combined during Stage Two of the study.

The following Table 5.1 outlines the study's timeline, indicating the evolution from a relatively small-scale investigation of international students' difficulties in using online information resources, to the wider exploration of the students' resources-using experiences and information literacy learning needs. The arrow indicates the ongoing development of the *expanded critical incident approach* that overlapped Stages 2 and 3.

Table 5.1 Research timeline

STAGES	RESEARCH ACTIVITIES
Initial Planning Stage August 2002 – December 2002	**Developed initial research plan** - CIT study of 12 international students at CQU Brisbane International Campus - Aim: *To investigate international students' use of online resources, to identify difficulties associated with linguistic or cultural differences*
Pilot Study January 2003 – July 2003	**Carried out data collection and initial analysis** - 4 students at CQU Brisbane International Campus
Stage One August 2003 – December 2005	**Data collection, concurrent analysis** - 8 students at CQU Brisbane International Campus - Binary categorisation of data (eg. Resources – Used/Not Used, Effective/Ineffective Search terms)
	Redeveloped study - Expanded critical incident approach - Revised aim: T*o investigate how international students use online information resources for learning, to identify associated information literacy learning needs* - Extended scope to include international students at QUT
Stage Two January 2006 – December 2008	**Data collection, concurrent analysis & interpretation** - 13 international students at QUT - Binary and thematic analysis, continuing interpretation and compilation of findings (as reported in this thesis)
Completion November 2008 – February 2009	**Final seminar**, **Submission of thesis**

During the Initial Planning Stage, I defined the aim of the study *as:*

To investigate international students' use of online resources, to identify difficulties associated with linguistic or cultural differences.

Thus, I determined to interview about 12 international student participants at CQU Brisbane International Campus using standard critical incident technique procedures (Flanagan, 1954). For data collection purposes, I developed a set of open-ended interview questions and a practical task, which would allow the international student participants to both discuss and demonstrate their approaches to using online resources.

Between January and July 2003 I conducted the Pilot Study, which involved four CQU-BIC students (Rod, Mak, Nik and Ann). The Pilot Study enabled me to trial the interview questions and undertake preliminary data analysis. The pilot study interviews yielded rich data, which were relevant to the research questions and confirmed the overall appropriateness of the data collection approach. During these

early interviews I noted that the students appeared to experience some difficulty in understanding jargon associated with online resources and in recalling the names of particular online tools. As a result, I made minor adjustments to the wording of the interview questions to assist comprehension. The revised interview schedule is shown in Appendix D. I also developed a resources checklist (Appendix E) to assist recall. In all other respects, I followed the same data collection approach for the Pilot Study and Stages One and Two.

As explained in the previous chapter, the data analysis approach evolved gradually throughout the study. During the Pilot Study and early in Stage One I attempted to follow a data analysis approach typical of critical incident technique (Flanagan, 1954). Thus, I developed and allocated data to a series of binary categories (for example used/not used, hard/easy). However, the richness and variety of the data prompted the gradual development of the nuanced analytical approach outlined later in the chapter (see the section entitled *Analysis Phase).*

Stage Two offered the opportunity to expand the scope of the study: from international students' *difficulties associated with linguistic or cultural difference;* to a more comprehensive investigation of international students' resource-using experiences and learning needs. Consequently, I redefined the research aim as follows:
To investigate how international students use online information resources for learning, to identify associated information literacy learning needs.
The revised research plan involved the integration of a similar number of international students from QUT, and the adoption of the *expanded critical incident approach* described in this chapter.

The aim of the activity of using online information resources

According to CIT procedures, I defined the *activity* to be investigated and its *aim*. These definitions, which remained unchanged throughout the study, are as follows:

- The **activity** to be investigated is: *using online information resources*.
- **The aim of the activity** is: *to learn*

Using online information resources is understood to involve active and intellectual engagement with online resources; it is integral to the wider *experience of using information to learn* (Bruce, 2008; Lupton, 2008). In determining the aim of this

activity, I followed Flanagan's (1954) recommendation to consult *experts in the field*. Given the educational orientation of the research, my group of experts comprised:

- eight academic librarians, with extensive reference and information literacy experience from four universities in Queensland (Australia)
- five research colleagues (three doctoral students and two supervisors)

As I requested by email, the experts responded in fifty words or less to the question:
What do you consider to be the aim of using online information resources?
Integrating key elements of all their responses, I compiled the following statement:
The aim of using online information resources is to gather information, develop understanding, widen experience, overcome challenges, adopt critical perspectives, construct knowledge, create new meanings and achieve learning outcomes.

This composite aim seemed to incorporate most elements of Bruce's (1997) *Seven faces of information literacy* [4] (with the possible exceptions of Category Four *Controlling information* and Category Seven *Using information wisely*). It also strongly suggested the connection between *using information* and *learning*, which Bruce (1997, 2008) and Lupton (2004a, 2008) demonstrate in their research. Synthesising the composite aim into the phrase 'to learn', I expressed the **aim of the activity** as follows:
The aim of using online information resources is to learn.

Plans and specifications for data collection

Having defined the activity to be studied and its aim, I developed and implemented the participant recruitment criteria outlined below.

Recruiting the participants

Given the exploratory nature of this study, the participant group needed to be of a size and make-up that would:

- allow me, as sole researcher, to effectively conduct in-depth interviews with individual participants, and fully analyse the resulting data
- yet reflect the diversity of international students in Australia

I resolved that all participants would be international students, rather than a mix of international and domestic students, since the investigation sought deep insight into

[4] Bruce's (1997) *Seven faces of information literacy* is discussed in Chapter 3.

aspects of international students' experiences rather than a comparative or longitudinal view of students in general. Thus, for the above reasons, I determined that the **optimum participant group** would include:

- 20 to 30 international students
- an even balance of students from two universities
- an even balance of undergraduate and postgraduate students
- a spread of age and gender
- students of varied nationalities and language backgrounds

As recruitment criteria, I specified that the participants should:

1. be international students, with limited-term study visas
2. be within the first 18 months of study at a university outside their home country
3. have completed at least one assignment that involved the use of online information resources in their current course at an Australian university
4. be enrolled in an Information Technology or Business degree course, at either undergraduate or postgraduate level
5. be from any country (other than Australia) and any language background (including English as principal language).

The underlying reasons for these recruitment criteria are outlined below.

For **Criterion 1,** I adopted the Australian government's definition of *international student* (Department of Education, Employment and Workplace Relations, n.d.; Department of Immigration and Citizenship, n.d.). This clearly distinguished between 'sojourning' students from overseas countries (who are at the heart of this study) and overseas-born Australian resident students (who are equally significant, yet beyond the scope of the study). Whilst recognising that international students and overseas-born Australian resident students may share some cultural and linguistic attributes and associated educational challenges, I suspected that their experiences of life and study in Australia might be qualitatively different. In particular, I took account of two quite common aspects of international students' experiences: the transient nature and clearly defined (even single-minded) purpose of their enrolment at an Australian university. International students are generally short-term visitors to Australia, who complete their course of study and returning home in 2 to 3 years. During their time in Australia, international students are often separated from their personal support networks, whereas overseas-born Australian-resident students might have more established family and community links here. Moreover, Australian-resident students might have completed some or all of their previous

education in Australia. Consequently, on commencing university here, they may have already developed some familiarity with prevailing educational practices and learning-related use of online resources.

Criteria 2 and 3 targeted recently arrived students with relatively fresh memories of their early resource-using experiences in Australia. I considered that interviewing students within the first eighteen months of study at an Australian university would enable me to investigate their previous study-related information use, as well as their on-arrival and ongoing information literacy learning needs. It was essential that participants had used online resources for at least one recently completed assignment, given that the specified *activity* under investigation was *using online information resources.* I judged Central Queensland University Brisbane international Campus (CQU-BIC) and Queensland University of Technology (QUT) to be appropriate locations for this research, due to their large, culturally diverse international student populations.

With regard to **Criterion 4**, Business and Information Technology courses attract a high proportion of international students at CQU-BIC and QUT. This criterion ensured broad consistency at course level, whilst allowing for some variety across study areas within the two disciplines. I sought undergraduate and postgraduate participants in order to view the relative information using experiences and learning needs of students at both levels.

Criterion 5 allowed me to recruit students from a wide range of nationalities and language backgrounds, allowing for natural diversity among participants.

Purposeful sampling

In recruiting participants for the study I adopted a purposeful, self-selecting approach (Patton 1990). I noted a slight *snowball* effect (Patton 1990) involving four participants during Phase 2 at QUT. Towards the end, I took advantage of *opportunistic* sampling (Patton, 1990) to interview two students outside the specified disciplinary areas.

To invite participation, I provided information to international students, by means of:

- notices on general student noticeboards and Business and IT Faculty notice boards at CQU-BIC and QUT

- my visits to approximately 20 Business and IT classes at CQU-BIC and QUT, when I explained the research, handed out research information sheets (Appendix 1) and sought volunteer participants
- follow-up email information and invitations to about 10 class groups (to reach those not present in class and remind others)
- lecturers' verbal reminders to students in the following week's class
- my participation in a focus group for international MBA students at QUT

Through the various means described above, I made contact with numerous (possibly several hundred) potential participants at CQU-BIC and QUT. In case students were aware of my current professional role as campus librarian (at CQU-BIC) and later as lecturer (at QUT), I emphasised that I was conducting this research as a higher degree research student rather than as a university employee. I stated that their participation would in no way affect their course outcomes, although in the longer term it might support developing approaches to support students' information use and learning.

Volunteers were slow to come forward at both sites. I continued my recruitment efforts until I had gained a satisfactory participant group of 25 international students who met the recruitment criteria. Although I interviewed 27 students, I excluded the data provided by two QUT students: I discovered that one was a domestic Australian student, while the other had not yet completed an assignment using online resources in his current course.

The study's participants

Through the purposeful approach described above, I recruited 25 international student participants, whose key attributes are summarised in Table 5.2 below. Further details about individual students' personal, educational and professional experience is provided in Appendix C.

Table 5.2 Summary of participants

	CQU-BIC students (12)		QUT students (13)	
Home country	Mexico	1	India	3
	China	1	China	4
	Japan	2	Vietnam	1
	Israel	1	Palestine/Jordan	1
	Poland	1	Sweden	1
	England	1	Singapore	1
	Thailand	1	Indonesia	1
	Malaysia	2	Malaysia	1
	Taiwan	2		
Age & Gender	**Age:**		**Age:**	
	20-30	10	20-30	8
	30-40	1	30-40	4
	40-50	1	unknown	1
	Gender:		**Gender:**	
	Male	7	Male	6
	Female	5	Female	7
Principal language(s)	English	1	English	1
	Mandarin	2	Mandarin	6
	Cantonese	1	Vietnamese	1
	Hebrew	2	Arabic	1
	Spanish	1	Punjabi	1
	Polish	1	English/Punjabi	1
	Thai	1	Swedish/Finnish	1
	Mandarin/ Bahasa Malaysian/	1	Indonesian	1
	English	2		
Additional languages	None	1		
	English	3	English	3
	English + 1 other language	5	English + 1 other language	7
	English + 2 other languages	2	English + 2 other languages	1
	English + 3 other languages	1	English + 4 other languages	1
			English + 6 other languages	1
Current course at CQU-BIC / QUT	**Undergraduate:**	(7)	**Undergraduate:**	(5)
	Bachelor of IT	4	Bachelor of IT	1
	Bachelor of Tourism	1	Bachelor of Business	1
	Bachelor of Marketing	1	Bachelor of Mass Communications	1
	Master of Information Systems	1	Bachelor of International Business and Economics	1
			Bachelor of Nursing	1
	Postgraduate:	(5)	**Postgraduate:**	(8)
	MBA	3	MBA	3
	Master of HRM	1	Master of International Business	2
	Post Grad Certificate of Business	1	Master of Commerce	1
			Master of Accounting	1
			Master of Learning Innovation	1

As the above table shows, the 25 international student participants reflected the diversity of the international student population in Australia (Australian Bureau of Statistics, 2007; IDP n.d.). Individuals came from fifteen different countries across

Asia, Europe (including the United Kingdom), the Middle East, India and South America. Collectively they spoke about 20 different languages, including English. The participant group met all the study's recruitment criteria, except for those relating to students' ages and courses. The following Table 5.3 provides a comparison between the composition of the study's participant group and the specified recruitment criteria.

Table 5.3 Comparison of recruitment criteria and actual composition of the study's participant group

Recruitment criteria for participant group	Actual composition of participant group			
Between 20 and 30 international students	25 international students			
Balance of students from CQU and QUT	12 CQU Brisbane International Campus 13 QUT (11Gardens Point, 2 Kelvin Grove)			
Varied nationalities and languages	15 countries of origin 17 principal languages			
Students are within the first 18 months of study at a university outside their home country	All 25 students, all except 1 QUT student (Ali)			
Students completed at least 1 assignment using online resources in current course at CQU or QUT	All 25 students			
Balance of undergraduate and postgraduate students		TOTAL	CQU-BIC	QUT
	Undergraduates	11	7	4
	Postgraduates	14	5	9
Spread of age and gender	Age 20-30	18	10	8
	Age 30-40	5	1	4
	Age 40-50	1	1	-
	Age unknown	1	-	1
	Male	13	7	6
	Female	12	5	7
Students are enrolled in an Information Technology or Business degree course, at either undergraduate or postgraduate level	Business	18	8	10
	IT	5	4	1
	Nursing	1	-	1
	Education	1	-	1

The above table indicates that I achieved the required group size, as well as a quite even balance of students from both universities, and of undergraduates and postgraduates. As intended, there was considerable variation among the participants' nationality and languages spoken, and an even gender spread. The students' ages ranged between 20 and 50 years as intended, although the majority were between 20 and 30 years old. On reflection, I considered this concentration of younger students to be acceptable, since it reflected general international student demographics (Australian Bureau of Statistics, 2007; IDP n.d.).

The great majority of the participant group was enrolled in a Business or Information Technology (IT) course, as per the criteria. However, their distribution across

courses was less even (18 Business, 6 IT). This break-down reflects the response pattern of volunteers. **The 12 CQU-BIC participants** were quite evenly distributed between 7 undergraduate and 5 postgraduate courses. 5 students were studying for IT degrees and 7 for Business degrees. This disciplinary spread represented the courses available at CQU-BIC at the time. **The 13 QUT participants** were enrolled in a wider range of courses. Of the 9 postgraduates, 6 were studying Management or Business, 1 was studying for Master of Learning Innovation (Faculty of Education), and 1 was undertaking a research Masters in International Business. The 4 undergraduates were enrolled respectively in Bachelor of Information Technology, Bachelor of Business, Bachelor of Mass Communications and Bachelor of Nursing. In recruiting the QUT students, I initially sought volunteers from the Business and Information Technology faculties, to ensure a similar disciplinary spread as the CQU-BIC students. However, towards the end of the data collection phase I interviewed one Education and one Nursing student, who responded to my call for participants. Apart from course discipline, these two students met all the participant selection criteria. Rather than compromise the integrity of the study, this *opportunistic sampling* (Patton, 1990) enriched the study's findings by providing a glimpse of international students' experiences in alternative disciplinary fields. Moreover, the primary research focus was on students' use of information resources for learning in general, rather than for specific disciplines or courses.

Assignments as critical incidents

In line with critical incident technique, data collection and analysis centred on *critical incidents* associated with the *activity* being studied. Having defined the activity as *using online information resources,* with the aim being *to learn*, I designated *critical incidents* as: *recent instances of students using online resources for assignments.* To be acceptable as *critical incidents*, assignments needed to have been completed recently by participants. I intended that each student would contribute two *critical incidents:* one relating to an actual course-related assignment, another relating to the simulated (online task) assignment that I devised. The course-related assignments were varied in topic and type, since they were selected for discussion by individual students. The simulated assignment, which was common to all students, involved using resources for a pre-set topic.

Assignments constituted valid *critical incidents* for four reasons. First, in undertaking their assignments, the students engaged in the *activity* of *using online information*

resources. Second, assignments generally represent significant events in students' lives, both in terms of the activity itself and possible outcomes. Third, assignments constitute part of the learning process. This study builds conceptually on the understanding of an inextricable connection between using information and learning (Bruce, 2008; Lupton, 2008). Thus, there is a connection between the international students (1) using online resources, and therefore using information, to complete assignments and (2) learning. Fourth, since international students regularly undertake assignments, the participants were able to provide recent, authentic, first-hand accounts of the *activity*.

Researcher

For this study I was the sole researcher. I was able to apply my own professional experience in the field as librarian and information literacy educator, while my PhD supervisors assumed primary responsibility as 'moderators'. I took advantage of opportunities for regular peer debriefing (Lincoln & Guba, 1985) with research and professional colleagues, gaining critical feedback throughout the project.

Collection Phase

The Collection Phase of the *expanded critical incident approach* involves gathering data relevant to the *activity* being studied. To gain first-hand perspectives on the activity, data collection draws on informants' accounts of *critical incidents* which they participated in or observed.

In this study, participant recruitment and data collection extended over three periods of several months each, first at Central Queensland University Brisbane International Campus (CQU-BIC) and later at Queensland University of Technology (QUT). The participant group was relatively small, since I sought detailed evidence of students' resource-using experiences. In total I interviewed 28 students, but analysed data provided by 25 students. I excluded the interview data of three students, as follows:

- a QUT domestic student, who enabled me test the interview protocols and recording equipment prior to the pilot study
- a QUT domestic student who attended an interview, but did not meet the international student selection criterion

- a QUT international student who had been in Australia less than a week and did not meet the criterion of having used online resources in his current course

For data collection, I conducted **semi-structured (or semi-standardised) interviews**, since they provide a powerful means of establishing rapport with participants and can elicit both factual information and participant perceptions (Flick, 2002; Patton, 1990). The interviews were generally in **four parts**, during which the students:

- participated in informal opening conversations
- completed a resources checklist
- responded to open-ended questions
- carried out an observed online task

To ensure consistency in data collection, I used a self-devised set of **data collection protocols**. Apart from a few minor changes in wording and the addition of the *online resources checklist* made after the pilot study, I used the same protocols throughout. They are summarised in Table 5.4 below and shown in full in Appendices A, B, D and E.

Table 5.4 Summary of data collection protocols

DATA COLLECTION PROTOCOLS		INCLUDED AS
Participant information sheet - explains the scope and purpose of the study, and the conditions of their participation		Appendix A
Participant consent form - completed by all participants, in accordance with QUT and CQU research ethics requirements		Appendix B
Interview schedule, comprising:		
• Set of open-ended questions	- posed by researcher & answered by participants during the interviews	Appendix D
• Checklist of online resources used/not used for a recent assignment (introduced in Stage One)	- completed by participants during the interviews	Appendix E
• Brief description of the online task	- carried out by participants & observed by researcher during the interviews	Appendix D

These different data collection strategies allowed for triangulation (Flick, 2002; Gall, Borg & Gall, 1996) between the students' first-hand accounts of how they had used resources on a previous occasion, and my observations of them actually using

resources. It also eased communication barriers, by enabling the students to both describe and demonstrate their approaches to using online resources. I developed an interview structure that would address the *what? how? why?* of the students' resource-using experiences (Kvale, 1996).

Through these data collection strategies I gained data relating to 48 assignments that had involved the use of online resources. The data were richly varied and covered students' resource-using actions, as well as their affective and reflective responses and cultural-linguistic dimensions.

Informed consent

In line with CQU and QUT research ethics guidelines, I ensured that each student gave their informed consent to participate in the study. Before their interview I gave each student a copy of the *Participant information sheet* (Appendix A) and a *Research participation consent form* (Appendix B). I explained the nature of the study and the conditions of their involvement, as well as my role and responsibilities as researcher. I advised students that I would respect their confidentiality and their right to withdraw from the study at any time. I gave students the opportunity to ask questions and then invited them to sign the *Research participation consent form*. None declined to continue with the interview at this stage, nor withdrew later.

Semi-structured interviews

The semi-structured interviews generally lasted between 60 and 90 minutes and involved me and one student. On one occasion, two students opted for a joint interview. The interviews took place privately at CQU-BIC and QUT, in neutral meeting rooms with networked computers. With the permission of each student concerned, I made an audio recording of the interviews and I took written notes. In acknowledgement of their contribution, I offered students some tuition in using online information resources on completion of their interview. Several took advantage of this opportunity. As a further token of appreciation, I gave students a single cinema voucher, as well as light refreshments.

The interviews had a conversational flavour. I aimed to create an informal and relaxed environment, in order to minimise students' uncertainties and encourage them to speak freely. As explained in Chapter 4, I was mindful of the students'

cultural and linguistic diversity. Consequently, in preparing the questions and in conducting the interviews I aimed for clear expression, taking care to: explain the interview purpose and process; speak clearly; reiterate or rephrase questions where necessary to assist the students' comprehension; and to respect personal and cultural perspectives. During the Pilot Study, I noted various language-related uncertainties, especially with specialist terminology such as *online resources* and *online tools*. Students also appeared to experience some difficulty in recalling the names of particular online resources. Thus in subsequent Stage One and Stage Two interviews, to assist comprehension, I gave each student a copy of the *interview schedule* (Appendix D) which contained the interview questions and described the set task. Also, in Stage One and Stage Two interviews I provided a resources checklist (Appendix E) as a memory refresher, which listed types of online resources and named common online tools.

The interviews had four overlapping parts: *opening conversations, online resources checklist, open-ended questions and online task*. Appendix F summarises the interview questions and their correspondence with the research questions.

Opening conversation

Each interview opened on a light note, with general conversation. During this time I aimed to set the student at ease and develop a degree of rapport and mutual trust. I invited the student to talk about: their home country and the languages they spoke; their previous educational and professional experiences; their transition to life and study in Australia; and their previous use of online information resources. Sometimes I shared my experiences as an international student in Spain.

Online resources checklist

Having broken the ice, I moved the focus onto a specific *critical incident* involving a recent assignment. I invited each international student to:
Think about an assignment that you have done at CQU-BIC/QUT that required you to search for information using online information resources.
I then asked the international students a series of open-ended questions relating to what the assignment was about; what they had to do for the assignment; what type(s) of information they needed for the assignment; and what online resources they used for the assignment. From Stage One onwards, as a memory refresher, I

gave each student a copy of the *Resources checklist* (Appendix E), requesting that they tick online resources that they used for the assignment.

Open-ended questions

After completing the checklist, I asked the students a series of open-ended questions relating to how and why they had used the online resources for their nominated assignment. In particular I asked about:

- what they found easy or hard about using online resources
- how they sought help to use online resources
- the more positive or less positive aspects of using online resources
- how being an international student affected their information using experiences
- their thoughts and feelings about using online resources
- their suggestions for improving the experience of using online resources

Where appropriate, I followed the open-ended questions with casual probing questions to clarify meanings or gain further information.

Observed online task

During the final part of the interview, I observed students using online resources for a set topic. This task was intended to compensate for linguistic limitations, since students had the opportunity to show, as well as explain, their information-using approaches. The online task was designed to be authentic and straight forward to carry out, whilst capable of yielding plentiful data. The task was built upon the holistic understanding of *using online information to learn* (Bruce, 1997; Bruce, 2008; Lupton, 2004a, 2008) that underpins the study. It provided data about the students' overall resource-using approaches, such as planning and implementing a search strategy. It also provided data about specific aspects, such as selecting keywords and evaluating results.

The online task simulated an assignment that required students to use online information resources for the following topic:
Prepare an annotated bibliography on effective public speaking techniques for business.
I asked the students to demonstrate how they would search for and select information on the topic, using the library catalogue, a journal database and an Internet search engine. Since I aimed to investigate their existing knowledge, I did not pre-advise the students about the nature of the task or the topic. I encouraged

the students to describe their thoughts and actions whilst carrying out the task, and I asked clarifying questions where appropriate.

The topic was sufficiently generic to be meaningful to students across disciplines. In order to create an authentic task, I drew on wording and requirements in actual CQU assignments. The topic intentionally included several points of potential challenge for international students, which I was aware of through my professional practice. Although the topic consisted of eleven words, its essence could be reduced to the two-part phrase *public speaking for busines*s. Thus the topic integrated an activity element (*public speaking*) and a contextual element (*business*).I determined that optimum searching would combine the terms *business* and *public speaking* (or *speaking)*. Neither term alone would sufficiently address the nature of the topic. I intentionally padded the topic with the words *effective* and *techniques* to see how the students would handle what I considered to be non-essential terms – whether they would recognise them as such and exclude them from their search strategy. I included *annotated bibliography*, to test their understanding and approach to academic terminology.

Analysis Phase

The Analysis Phase of the *expanded critical incident approach* shows greatest expansion from CIT. In this study it involved CIT-type binary categorisation (Flanagan, 1954), as well as thematic analysis (Ezzy, 2002; Miles & Huberman, 1994; Patton, 1990). I gradually created a network of inter-related categories, to define patterns and describe qualitative nuances in the data. In contrast to CIT's mutually exclusive categories, the network allows for data relationships, across and within categories.

The data analysis approach

In line with the research aim, the purpose of the analysis was to uncover aspects of the participant students' resource-using experiences, and to identify particular information literacy learning needs. The data analysis approach needed to accommodate a range of data types and sources, which included:

- demographic data from government sources

- documentary evidence relating to the students' higher education and online environment
- students' personal attributes, educational and cultural-linguistic experiences
- factual accounts of resources used by students
- observations of students carrying out the practical task
- students' affective and reflective responses

Data analysis involved a qualitative, inductive process (Ezzy, 2002; Miles & Huberman, 1994; Patton, 1990). In a manner similar to grounded theory (Glaser, 1998), I engaged in continuous examination and re-examination of interview transcripts, gradually sifting and sorting data, developing and revising categories as new data emerged and relationships became apparent. This rigorous approach took account of the nature of the problem, the data collected, and the intended application of the findings (Ezzy, 2002; Miles & Huberman, 1994; Patton, 1990).

In keeping with the emergent nature of this study's *expanded critical incident approach* (Chapter 4), data analysis occurred concurrently with data collection. Consequently, the analytical process began immediately following the Pilot study interviews and continued through to the final stages of writing up the findings. Key activities of the data analysis process included:

- Transcription of audio-recorded interviews
- Examination and coding of the transcribed interviews
- Compilation of spreadsheets to organise data and categories
- Ongoing creation and modification of data categories
- Eventual development of the network of categories

Within days of each data collection interview, either I or a professional transcriber typed a verbatim transcription of the interview recording. Due to the cultural and linguistic diversity of the international student participants, there were marked variations in syntax and accents between interviews, which posed some transcription challenges. Thus, it was often necessary to listen repeatedly to particular words and phrases to recognise their meaning. Words and phrases that remained unrecognisable were indicated with an **X** in the transcription. On completion I read through each transcription, checking its accuracy against the recordings and amending where necessary. Over time, as I became more familiar with students' speech patterns, I was able to go back and fill in the blanks in the

transcriptions. I then attached the resources checklists (Appendix E) completed by the students to the transcripts.

Throughout the analysis process, I revisited the interview recordings and read and re-read each transcript many times. In this way I gained close familiarity with each student's narrative and came to notice nuances, similarities and differences in their experiences. When working with the transcripts, I coded themes, using colours and letters. I added margin notes (or memos) for unusual or significant points. I used electronic spreadsheets to organise categories and assign data to categories. Early in Stage 2 of the study I experimented with the NVivo computer assisted data analysis program, but I preferred the immediacy of working with the transcripts.

To accommodate the varying data types I adopted two different analytical strategies: binary categorisation and thematic analysis. Binary categorisation is typical of CIT (Flanagan, 1954). I used it to identify factual details, for example: particular online resources that the students used or did not use; or particular aspects that they found *easy* or *hard*. Thematic analysis (Ezzy, 2002; Miles & Huberman, 1994; Patton, 1990) allowed more nuanced analysis than binary categorisation. Through thematic categorisation I captured qualitative aspects, such as students' affective responses to online resources, or cultural-linguistic dimensions of particular challenges.

During the study's early stages I tested several data analysis strategies, as patterns started to become evident in the emerging data. Eventually, I decided to go back and analyse the interview questions themselves. Reviewing each interview question in turn I asked myself:
What is the essence of this question? What data am I looking for?
I then paraphrased each interview question in the simplest form possible, beginning with an interrogative (*What? How? Who?*). By changing from second to third person, I shifted the analytical focus from the students' responses, to the data that the responses contained. In this way I developed a set of **focus questions** (Appendix G) that enabled me to gain a clearer view of what to look for in the participant's responses. For example, Interview Question 12 asks:
What do you think could be done to make using online information resources a more positive experience for international students?

When paraphrasing the question, I recognised that it contained two significant elements, relating to information literacy learning needs and resource improvement needs. Consequently I divided the question into three focus questions, as follows:
What information literacy learning needs do the students identify?
What improvements do they suggest for online resources?
What improvements do they suggest for information literacy education?

Appendix G shows how the categories align with the interview and focus questions. The following sub-sections describe the data analysis approach for each category.

A network of elements

The focus questions suggested a fresh and fruitful analysis approach, enabling me to identify a network of eight *elements* that constituted the students' experience of using online information resources to learn. These elements came to represent the main data categories, as follows:

- *Students:* international students who are using online resources to learn
- *Information-learning environment:* the Australian higher education environment in which international students are using online resources
- *Interactions:* instances of international students' active use of, and intellectual engagement with, online information resources
- *Strengths-Challenges:* points of strength and difficulty experienced by international students in using online information resources to learn
- *Responses:* international students' affective responses about online resources
- *Languages-Cultures:* cultural-linguistic dimensions of the international students' experiences of using online resources to learn
- *Information-learning:* the international students' informal help seeking and participation in formal information literacy education, for using online resources
- *Reflections:* the international students' reflective responses to the whole experience of using online information resources to learn

The eight elements (shown later in Figure 6.1) are inter-connected, yet all have a distinctive flavour and significance. They are of two types: *essential elements* and *incidental elements*. *Essential elements* are associated with the activity of using online resources. *Incidental elements* are qualitative dimensions of the experience, which in various ways affect international students' use of online resources.

The three *essential elements* are: *students, interactions* and *information-learning environment*. In terms of Wilson's (1997, p. 552) *context of information need,* the three essential elements relate respectively to *the person, performing a role, in an environment.*

The five *incidental elements* are: *strengths-challenges, information-learning, languages-cultures, responses* and *reflections. Strengths-challenges* relate to particular strengths and challenges the students experience in using online resources, while *information-learning* relates to the ways in which the students learn, and gain help, to use them. *Languages-cultures* are various cultural and linguistic dimensions of the international students' resource-using experiences. *Responses* and *reflections* are respectively the students' affective and reflective responses to using online resources.

In the context of this study, the above categories have a similar purpose to the main categories of CIT's *frame of reference* (Flanagan, 1954). They define the overall scope of the data and provide organising points for the analysis. Most of the above categories contain more specific *sets* of data. The following sub-sections describe each of the categories and their data analysis purpose.

Students

Students data consisted of biographical information, shared during informal conversation in the opening part of the interviews. The *students* category encompass several sets relating to their:

- age and gender
- home country
- language(s) spoken
- educational and professional experiences
- transition (to life and study in Australia)
- previous library and online resource use

In analysing *students* data I adopted two different approaches. First, I created a spreadsheet of demographic details (first five sets above). Second, I carried out thematic analysis of the students' narratives about their educational, information-using and life experiences.

Information-learning environment

Information-learning environment data are associated with the students' physical location and online domain. These data do not relate to a particular interview question, but arise from students' interview comments and documentary sources. I treated the data thematically, allocating them to the sets:

- location (CQU Brisbane International Campus and QUT): for example, the student population, library services, information literacy programs
- online domain: for example, the university library website and the wider Internet

Interactions

Interactions data relate to the multiple ways in which the students actively used - or interacted with - online information resources. *Interactions* are understood to involve intellectual and physical engagement with online resources. Conceptually, *interactions* data are associated with the four phases of the online information use cycle, which is represented by the *Reflective online information use model* (Hughes, Bruce & Edwards, 2007). [This model is described more fully in Chapter 8 and shown in Figure 8.3]. The data may relate to macro level *interactions*, such as developing and implementing an information search strategy, or they may relate to micro level *interactions*, such as accessing a database or evaluating a particular journal article. Thus *interactions* both include and extend beyond information behaviours or skills. In the analysis I allocated them to three sets: *assignments*, *resources* and *approaches*.

Assignments data are associated with the students' *critical incident* assignments. The data, which indicate ways in which students understood and carried out the assignments, relate to interview Questions 1 and 2: *What was the assignment about? What did you have to do?*
I used binary and thematic analysis for this data.

Resources data also relate to the students' *critical incident* assignments and indicate which resources the students used. The data are associated with interview questions 3, 4 and 5 and are drawn from the *Resources checklist* (Appendix E), which students completed during their interview. For this data, I applied a binary analysis, reminiscent of CIT, whereby I identified students' *use* or *non-use* of particular resources. I grouped resources in sets by type of resource, then by name of resource, coding them U or NU (*used*, *not used*), as the following examples show:

- Journal database – *ProQuest* (U)
- Web resource - Company report (NU)

The *approaches* data are associated with the observed online task that the students carried out. The data concern how the students used online resources to identify and select information on a set topic. They relate both to my observations and the students' commentary during the task (as recorded during interviews). Data analysis for this set involved binary and thematic analysis.

First, to identify students' resource-using strengths and challenges I evaluated their *interactions* with online resources during the online task. For this part of the analysis I allocated students' *interactions* to four main categories which related to the four phases of *Reflective online information use model* (Hughes, Bruce & Edwards, 2007) (Figure 8.3). Thus, the four main categories are *plan, act, record and reflect*. For example, the *interaction* of *determining search strategy* is associated with the *plan* category, while *entering search terms* is associated with the *act* category. I then coded the interactions as S or US (successful or unsuccessful), for example:

- Plan – Develop search strategy – (S)
- Reflect – Evaluate search results (US)

In this respect, I followed CIT-type binary categorisation, with a focus on effective completion of an activity. However, by setting the results against the *Reflective online information use model*, I also viewed the students' interactions within the whole experience of using online resources. The model also provided a structure for representing findings relating to students' resource-using approaches.

In addition to evaluating the students' interactions, I identified and thematically analysed the comments students made whilst carrying out the task. These comments complemented my evaluation, by providing insight into their thoughts and feelings whilst using resources. In some cases they explained particular choices or actions made during the task.

Strengths-Challenges

Strengths-Challenges data relate directly to the study's *activity* (using online information resources) and its *aim* (to learn). The *strengths-challenges* data are drawn from the students' narrative throughout the interview, and in particular from their answers to interview Questions 6 and 7:

What did you find easy (or *hard*) *about using online information resources? Why?* Thus the data may be associated with particular *interactions,* or with the overall experience of using online information resources for learning. In analysing the *challenges* data, I applied binary and thematic analysis. First I identified instances that the students themselves described as *easy* or *hard* (or a synonym such as *difficult*). Otherwise, I did not guess implied meanings of easy or hard. I coded the instances using CIT-type indicators E and H (easy and hard). This data became a tabulated summary of the students' resource-using strengths and challenges. Next, I sought clues among the students' narrative that either described or explained the nature of the challenge.

Information-learning

Information-learning data relate to the students' informal help-seeking, and their participation in formal information literacy (IL) education. They are associated with the purpose and outcomes of using online resources. The data arose during interviews with students, in particular when responding to interview Question 8: *What help did you get in using online resources and tools for this assignment?* I used binary and thematic analysis for this element, which includes two sets: *help-seeking* and *formal IL*.

The *help seeking* set relates to the students' accounts of how they independently sought help in using online resources. From the interviews, I identified instances of help-seeking and sources of help. I recorded them in the data spreadsheet, using CIT-type indicators HS and NSH *(help seeking* and *non-help seeking)*, for example:

- Interactions - Help seeking – Librarian (HS)

Seeking deeper insights, I then identified and thematically analysed students' statements that either described the nature of their help-seeking, or explained their reasons for seeking or not seeking help.

The *formal IL* set relates to the ways in which students learned to use online resources. From the CQU and QUT Library websites I identified the information literacy education activities available to students at the time. (These included library orientations, generic information skills sessions, course-related information literacy classes and online tutorials). From interview data, I then identified which information literacy activities the students had experienced. Using CIT-type indicators IL and NIL

(formal IL and no formal IL) I recorded instances of participation and non-participation in different types of information literacy education, for example:

- Formal IL – Orientation session (IL)

I then sought students' statements that would further describe the nature of their information literacy learning, or explain their participation or non-participation.

Responses

Responses data represent the students' affective responses. Here the data are drawn from the students' narrative throughout the interview, as well as in response to interview Question 13: *How would you sum up your thoughts and feelings about using online resources and tools?* In analysing the *responses* data, I recorded students' thoughts and feelings in the words they used, without attempting to interpret any underlying meanings. In this way I sought merely to report the range of affective responses that contributed to the students' resource-using experiences. (Psychological implications were outside the scope of the present study).

In analysing the data, I noted *more positive responses* (MP) and *less positive responses* (LP) as follows:

- *more positive responses* included the terms *useful* and *pleased* - for example: "I think online resources are useful", "I feel pleased when I get good results"
- *less positive responses* included the terms *annoyed*, *boring* – for example: "(I think) using information resources is boring" "I feel annoyed with the computer"

Here the binary analytical pattern reflects CIT. However, the headings *more positive responses* and *less positive responses* suggest a continuum rather than a straight divide between positive and negative. In softening the boundaries I sought to reflect the nuances of affective responses that I found CIT did not adequately allow for.

Languages-Cultures

Languages-cultures data represent the varied cultural and linguistic dimensions of the students' resource-using experiences. They are closely related to the *responses* and *challenges* element, for example:

- a student *felt* pleased that *Google* (2008) was *easy* to use for gaining access to information about familiar companies in her home country [*cultures*]
- a student *felt* annoyed because he found it *hard* to scan through a long results list due to limited English language fluency [*languages*]

Languages-cultures data were drawn from the students' narrative throughout the interview, and in particular from their answers to interview Question 11:
In what ways do you think being an international student affected this experience? Thus the data may be associated with particular *interactions* or with the overall experience of using online information resources. For this element, as with *challenges* and *responses* data, I only considered instances where students made explicit reference to culture or language.

Languages-cultures data were associated with a wide range of interactions. For example, cultural dimensions were evident in unfamiliar literary allusions in search results, and in uncertainties in student-educator relationships. Linguistic dimensions were evident in vocabulary limitations when selecting search terms, and in successful use of own-language search engines. Here the analysis involved only a thematic approach. The data relating to cultural and linguistic *dimensions* showed themselves to be qualitative nuances of individuals' experiences. Thus they proved unsuited to CIT-type binary categorisation.

Reflections

Reflections data relate to the students' whole experience of using online information resources to learn. They are drawn from the students' narrative throughout the interview, and in particular from their answers to interview questions 9, 10 and 12:

- *Overall, would you say that using online information resources for this assignment was a positive (or not positive) experience? What makes you think it was a positive (or not or positive) experience?*
- *What do you think could be done to make using online information resources a more positive experience for international students?*

Although the interview questions imply a CIT-type dichotomy between *positive* and *not positive* experiences, the data reflected nuances of experiences that were only capable of thematic analysis. In analysing *reflections* data I identified two main perspectives among the students' responses, which I described as *backwards reflection* and *forwards reflection.*

Backwards reflection incorporates students' comments looking back over their use of online information resources for assignments. Data include students' overall impressions; metaphors (students' descriptions, and personal meanings of their

experiences); and insights (that students have gained into their information literacy learning). *Forwards reflection* incorporates students' comments about the future implications of their experience, in terms of their continuing information use and learning. Data relate to impacts of the experience on individual students; students' continuing information literacy learning; students' suggestions for improving information literacy education and online resources.

Critical features

In analysing the students' accounts and my observations, I noted six recurring themes - or *critical features* - that describe the nature of the students' experience of using online resources. These critical features are *diversity, unfamiliarity, overflow, limited support, shared experience* and *imbalance*. They may be associated with any of the eight elements outlined above. For example, aspects of *unfamiliarity* occur in data relating to the following elements: *information-learning environment, interactions (resources), interactions (approaches), strengths-challenges, responses* and *languages-cultures.*

Analysis in practice

As mentioned above, the data are inter-related. Seemingly simple *interactions* may be associated with a range of other *interactions,* as well *as* qualitative dimensions such as affective *responses* and *cultures-languages*. Table 5.5 below demonstrates the range of data that may be identified in a brief interview extract.

Table 5.5 **Interview excerpt – analysis example relating data to categories**

Interview extract: *In the library thingy for the search engines* [journal databases] *it's just the amount of English…For me as a Hebrew speaker it's very hard to start reading everything. And it's very hard to like scan for words and it's not very…fun. It's very hard to get the main idea in seconds like it would be in my language. So actually I'm sitting there reading…and have no idea if it's right or not like… with the time stress…If it was in Hebrew I might be very disappointed as well because of the amount of it. But… I guess if they had …less options on the screen it would be easier…Like some websites, like Google, it's very simple…one turn you're finished. In the library catalogue you actually have to go and look and it's links that have nothing to do with what you're looking for and then the title is different and you have to …go and look for different titles and it's not as simple as it could be…too sophisticated, so it's very annoying.* (Ann)

	Interactions	Responses	Challenges	Languages - Cultures	Reflections
it's just the amount of English…as a Hebrew speaker it's very hard to start reading everything … to like scan for words … hard to get the main idea in seconds like it would be in my language.			✓	✓	
it's not very…fun		✓ less positive			
have no idea if it's right or not		✓ less positive			
If it was in Hebrew I might be very disappointed as well					✓
time stress			✓ personal		
if they had … less options on the screen it would be easier	✓ resources				✓
Google, it's very simple … …one turn you're finished	✓ resources	✓ more positive			
In the library catalogue you actually have to go and look and links that have nothing to do with what you're looking for … not as simple as it could be	✓ approaches	✓ less positive	✓ access & navigation		
too sophisticated		✓ less positive			
it's very annoying		✓ less positive			

Although brief, Ann's comment (Table 5.5) is rich in data relating to five different elements. She provides information arising from her *interactions* with online databases, *Google* and the library catalogue. Ann reveals that it can be difficult [*challenge*], for a student whose principal language is not English, to read large amounts of text in English [*languages-cultures*]. She indicates that difficulty is associated with feelings of uncertainty [responses] and that she experiences 'time stress' [*responses*]. Overall her *responses* are quite negative: using databases is 'not very … fun', the catalogue is 'too sophisticated' and 'annoying'. Her comment

[*reflection*] about whether or not the outcomes would be different if using resources in her own language indicate other possible (non-linguistic) points of *challenge*. She also offers a suggestion for improving resources by providing fewer on-screen options [*reflection*].

Interpretation Phase

This fifth phase of the *expanded critical incident approach* coincides with the Collection and Analysis phases. It involves interpreting data and presenting findings.

Interpreting the data

In interpreting the data, I was guided by the research aim:
to investigate how international students use online information resources for learning, and to identify associated information literacy learning needs.
Given the information literacy orientation of the study, I considered the 'consumers' of the research (Kain, 2004, p. 77) to be primarily educators, information professionals and learning advisers. Therefore my guiding question for interpretation was:

⇒ *What do educators, information professionals and learning advisers need to know about the experiences of international students, in order to support their information literacy learning?*

Furthermore, in order to remain focused on the intended application of the findings, I continuously asked myself:

⇒ *What does this particular data reveal about the students, or their context, or their learning-related resource use?*

⇒ *Does it convey fresh information or perspective?*

⇒ *Does it confirm or counteract other information or perspectives already categorised?*

⇒ *What does it tell about their information literacy learning needs?*

The above questions enabled me to identify significant aspects of international students' information literacy learning experiences and needs. For example, Ann's comments (Table 5.5) indicate several important considerations for educators. They suggest that we need to be aware that scanning and understanding (online) documents can be time-consuming and frustrating for students who are not

completely fluent in English. Ann's comments indicate a need for learning opportunities that enable students to develop reading-for-meaning strategies. Also they suggest a need to consider students' varying linguistic and educational backgrounds when setting assignment tasks, and to provide appropriate guidance and examples. There also might be wider implications for curriculum and pedagogical development, for student support services and for resource design. Importantly also, Ann's comments warn against making generalised assumptions about international students' information literacy and learning needs. She hints that her challenge may not be exclusively language-related, by raising the possibility that she might also experience difficulty using online resources in Hebrew, her principal language. This possibility is supported by her statement earlier in the interview that she had not used online resources prior to CQU-BIC.

Presenting the findings

The findings are presented in two ways, as a word picture of international students using online resources to learn, and as a set of *critical findings.* The word picture offers a wide-angle depiction of the students' experiences, while *critical findings,* summarise key aspects of the students' resource use and information literacy learning needs. Thus, the findings respond to the two research questions:
RQ 1: *How do international students use online information resources for learning?*
RQ 2: *What are their associated information literacy needs?*

The word picture is multifaceted and integrates contextual, personal and factual detail and descriptive narrative. Student vignettes and direct quotations add to its reality and vitality. Ezzy's analogy of a 'multidimensional tangled ball of wool' (2002, p. 138) conveys my intention here:

> There are many threads that interweave through the complex set of interviews, reflections and observations. The task of writing is to reconstruct this multifaceted, multidimensional ball of information into a linear story with a beginning, middle and end.

The *critical findings* correspond with, but extend beyond, CIT's *critical behaviors.* They are intended to be descriptive and indicative rather than predictive or generalisable. For example, Ann's comments (Table 5.5 above) illuminate the real-life experiences of an international student. They might not be representative of international students in general, but they contribute to our understanding of particular information literacy learning approaches and needs. When considered in conjunction with other students' comments, they enable us to identify similarities and

variations in students' resource-using approaches, as a basis for developing flexible information literacy learning strategies that address learners' real needs.

The findings are reported fully in Chapters 6 and 7, while their implications are discussed in Chapter 8.

Reflection Phase

Although the Refection Phase expands beyond CIT's five steps, reflection is integral to the *expanded critical incident approach.* It enables overall evaluation of the study and ongoing progress, as well as supporting particular activities within each phase.

Throughout the study, I adopted a reflective approach, which centred on *critical incidents* and *critical realisations* relating to my research experiences. Thus reflection supported the ongoing critical evaluation of my data collection, analysis and interpretation activities. It also enabled me to review emergent results, identify further research needs and plan further initiatives. The following example illustrates my reflective approach.

For a while I struggled to find a way forward with data analysis. I had developed a quite complex coding system for the transcripts and I was trying to fit the data into a binary structure of categories as per critical incident technique (Flanagan, 1954). However, I was finding it difficult to reconcile the rich emerging data with my system. Through ongoing reflection, I became aware of the need to reorient my data analysis approach, but was unsure of the direction to take. While scanning various journal articles and theses for possible inspiration, I chanced across a keynote address by Bruce (2004) that included a model developed by Edwards (2006) in her doctoral research. Although I had attended Bruce's keynote address, I had not recognised the significance of the model for my research until that moment, several weeks later, when I read about it in a different context.

The *critical incident* of 'finding' Edwards's (2006) *Action research model for reflective Internet searching* opened up a new way of thinking about and representing the data, in terms of an action research-type cycle. This in turn triggered further *critical realisations* concerning the relationship between Edwards's model (2006) and Bruce's (1997) *Seven faces of information literacy.* As a result I developed a further

Reflective online information use model (Hughes, Bruce and Edwards, 2007) which is shown in Figure 8.3. This model came to support the expansion of my research approach, enabling me to consider international students' experiences holistically, beyond the positive/negative behavioural terms I had grappled with previously.

Summarising the Study: Research Framework

The preceding sections have outlined the five inter-connected phases of the *expanded critical incident technique*. The following *research framework* (Table 5.6) acts as a map to the overall research design and its implementation, showing how different parts of this *quilt-like study* (Chapter 4) fit together.

Table 5.6 Research framework

	International students using online information resources for learning			
CONCEPTS	***Research questions:*** *How do international students use online information resources for learning?* *What are their associated information literacy needs?*			
	Conceptual frame: Overarching: U*sing information (resources) to learn is a multifaceted experience* (Bruce 1997; 2008) Contributing: *Context* (Wilson), *Interplay* (Kuhlthau 2004), *Reflective model* (Edwards & Bruce 2002)			
	Research approach: *Expanded critical incident approach* - builds on & expands around critical incident technique (Flanagan 1954) Contributing theory: Naturalistic inquiry, action research, grounded theory, case study			
RESEARCH STRATEGIES	**FOCUS QUESTIONS**	**DATA COLLECTION** **Data types & Sources**	**DATA ANALYSIS** **Data categorisation strategies**	**ELEMENTS** **Title & Format**
	What characterises the environment where they use resources?	Type: Documentary evidence Source: Literature review	Thematic categorisation - Identify characteristics of contemporary Australian HE	*Environment* - Description
	Who are the participants?	Type: Demographic data + Students' accounts Source: Published documents + Interview	Thematic categorisation - Identify participant attributes & experiences - personal, cultural, linguistic, educational	*Students* - Description + Narrative
	How do they understand the assignment? How did they address the assignment?	Type: Students' accounts of carrying out their 'critical incident' assignment Source: Interview	Thematic categorisation - Identify background details about the assignment, and how students' approached it	*Interactions: Approaches* - Narrative
	What online resources do they use?	Type: Students' accounts - Use/ Non-use of online resources Source: Interview + Resource checklist	Binary categorisation: Used/Not used - Identify which online resources students used for a specific assignment	*Interactions: Resources* – Table
	How do they use online resources for assignments?	Type: Students' accounts - using online resources + Researcher observations Source: Interview + Observed online task	Thematic categorisation - Identify how students used online resources for a specific assignment	*Interactions: Approaches* - Narrative + Conceptual model
	What strengths and challenges do they experience in using online resources?	Type: Students' accounts - Easy/hard aspects of using online resources Source: Interview	Binary categorisation: Easy/Hard + Thematic categorisation - Identify students' challenges & strengths using online resources	*Challenges* - Table + Narrative
	How do they seek help and learn to use online resources?	Type: Students' accounts of help seeking & formal IL learning Source: Interview	Binary categorisation: Used/ Not used +Thematic categorisation Identify students' experiences of help seeking & IL learning	*Information-learning* - Narrative
	How do students view the whole experience of using online resources for learning?	Type: Students' reflections on using online resources & their IL learning needs Source: Interview	Thematic categorisation - Identify overall impressions and evaluative comments	*Reflections: Backwards reflections* Critical review
	What cultural and linguistic dimensions do they experience in using resources?	Type: Students' accounts - cultural & linguistic dimensions of using online resources Source: Interview	Thematic categorisation - Identify cultural & linguistic dimensions of students' use of online resources	*Dimensions* - Narrative + Conceptual model
	What IL learning needs do the students identify?	Type: Students' reports of IL learning needs Source: Interview	Thematic categorisation - Identify students' IL learning needs	*Information learning needs* – Table + Narrative
	What improvements do they suggest for online resources & information literacy education?	Type: Students' suggestions for improving online resource design & IL education Source: Interview	Thematic categorisation - Identify improvement needs for design of online resources and information literacy education	*Reflections: Forwards reflections* – Recommendation
	How do they think and feel about using online resources?	Type: Students' accounts - affective responses to using online resources + Students' reflections on resource using experience Source: Interview	Binary categorisation: Positive/ Not positive + Thematic Identify students' thoughts/feelings/attitudes towards using online resources	*Responses* - Narrative + Conceptual model
	What are international students' information-learning needs?	Type: Researcher's synthesis of the study's findings	Thematic categorisation - Identify information literacy learning needs for culturally diverse online-intensive HE	*Critical findings*

The *research framework* (shown above) outlines the concepts and research strategies that are integrated into the study's *expanded critical incident approach*, as follows:

Research concepts:

- Row 1:*Title of study*
- *Row 2: Research questions* - sets the direction of the study
- Row 3*: Conceptual frame* - indicates the overarching concept and contributing concepts that frame the study
- Row 4: *Research approach* - identifies the research method as *Expanded critical incident approach,* which builds on critical incident technique, and draws on aspects of naturalistic inquiry, action research, grounded theory, and case study

Research strategies:

- Column 1: *Focus questions* – aligns data collection, data analysis and findings
- Column 2: *Data Collection* - outlines the different types and sources of data that I collected, showing how they relate to particular focus questions
- Column 3: *Data Analysis* - outlines the different data categorisation strategies that I used for analysing the data, showing how they relate to data collection and focus questions
- Column 4: *Findings* - outlines the various elements (or categories) arising from data analysis and the types of data they represent, showing how they relate to data analysis, data collection and focus questions

A Trustworthy Study

This final section demonstrates the integrity and credibility of this study. Responding to the trustworthiness principles of *naturalistic* inquiry (Lincoln & Guba,1985) I indicate the study's *credibility, transferability, dependability* and *confirmability*

Credibility

Credibility (Lincoln & Guba, 1985) recognises the multifaceted nature of human experience and, conversely, the impossibility of revealing a single, tangible reality or truth. Credibility is associated with the researcher's engagement with participants in their natural setting, and with the range and depth of the data gathered. *Credibility* is

also achieved through *triangulation* of data sources and research methods, as well as *referential strength* and *peer debriefing*.

The *credibility* of this study is apparent in the range and depth of findings presented in Chapters 6 and 7. The data are credible since they are grounded in reality, being associated with actual assignments that the students had completed, and online resources that they had used for study. Data collection took place in the international students' "natural" university setting where they were engaging in the activity under investigation. The emergent word-picture and *critical findings* throw light on the complex of *interactions,* affective and reflective *responses*, and cultural and linguistic *dimensions* that constitute the experience of using online information resources for learning.

I achieved data *triangulation* by collecting and analysing data of varying types, arising from student accounts, my observations, and the literature. During the interviews, students described and explained various aspects of their learning-related resource-using experiences. Using a checklist (Appendix E), they reported what online resources they used. During the observed online task, they demonstrated how they use resources. Through documentary sources I gained demographic and descriptive data concerning the students' information-learning environment. The study's *expanded critical incident approach* also allows for methodological triangulation, as it builds on critical incident technique (Flanagan, 1954) and is advised by grounded theory (Glaser, 1998), action research (Carr & Kemmis, 1986; Zuber-Skerritt, 1996) and phenomenography (Marton, 1986).

The *referential strength* of the study is demonstrated in the detailed description of the study's implementation (Chapter 5) and in the extensive presentation of findings (Chapters 6 and 7). The *research framework* (Table 5.6) demonstrates the cohesion of the research design, and the inter-relationship between research aims, conceptual frame, methodological approach and research findings. The findings are supported with direct quotations and vignettes, which reflect the reality of individual students' experiences.

Throughout the study I engaged in *peer briefing* with experienced researchers, fellow doctoral students, supervisors and colleagues within education and the information profession. Peer briefing opportunities included:

- monthly information research meetings

- conferences (International Lifelong Learning, International Learning, Information Seeking in Context, RAILS)
- doctoral workshop (Information Seeking in Context)
- online discussion; continuous literature review.

Peer briefing enabled me to explore different research perspectives and gain feedback on my work from respected critical friends. At various times I sounded out categorisation strategies and interpretations research and professional peers. In these ways, peer briefing helped keep me 'honest' and provided emotional support, as prescribed by Lincoln and Guba (1985).

Transferability

Transferabilty recognises the *situatedness* of the research in a 'natural' setting (Lincoln & Guba, 1985). It assumes that the researcher is presenting evidence applicable to particular individuals in a particular context. Consequently, as Lincoln and Guba (1985) point out, *transferability* stands in opposition to notions of generalisability.

This study provides an empirically sound, "thick description" (Lincoln & Guba, 1985, p. 316) of international students using online information resources at two Australian universities. The findings form a nuanced word picture, which represents a microcosm of international students' resource-using experiences. Thus, the findings offer the depth of insight and contextual colour that can be achieved by focusing on a particular group of individuals, at a particular place and time. The first-hand narratives and observations reveal similarities and differences, individuality and diversity among this group of students. For these reasons, the findings cannot be – nor are they intended to be - representative of international students, or even of international students at the two universities.

While the findings are not generalisable, they offer insights into the varying experiences, understandings and emotions that may be present among a group of international students. The findings do not claim that "this is what all international students do, think, feel or need" with regard to information resources. Rather, the findings highlight the kinds of thoughts, feelings and learning needs that individual international students may bring to their learning-related information use. The findings increase understandings about international students and their information literacy learning experiences. In this way they offer a reference point for

researchers, educators, and possibly international students, in future times and places. Here, I provide "the thick description necessary to enable someone interested in making a transfer to reach a conclusion about whether transfer can be contemplated as a possibility" (Lincoln & Guba, 1985, p. 316).

Dependability and confirmabilty

Dependability and *confirmabilty* are inter-related and serve to demonstrate the underlying integrity of the research; they stand in place of positivist concerns with reliability and objectivity (Lincoln & Guba, 1985). The "ephemeral and changing" nature of the experiences investigated, and the emergent research approach, prevent replication of this study's findings. "One can never cross the same stream twice" (Lincoln & Guba, 1985, p. 299). However, the *dependability* and *confirmability* of this study are evident in the detailed discussion of the research design (Chapter 4) and research implementation or 'process' (Chapter 5) and the research findings or 'product' (Chapters 6 and 7). As recommended by Lincoln and Guba (1985), I provide an 'audit trail' in the form of: detailed descriptions of data collection and analysis strategies, and categorisation strategies, supported by examples. In addition, the appendices include copies of information sheets, participant consent form, interview protocols, and tabulated data.

The data are presented fully and transparently. I offer my interpretations of the data in this study, whilst acknowledging that they are open to alternative or further interpretation by others. In this sense, the data are *confirmable*. The question of my objectivity as researcher is not relevant since the emphasis lies on 'the characteristics of the data' (Lincoln & Guba, 1985, p. 300).

Reflexivity

Spanning the four criteria outlined above, Lincoln and Guba (1985) recommend the use of a reflexive journal. They suggest that daily compilation of a reflexive journal enables the researcher to record a variety of information about *self* and *method*. With regard to *self*, the reflexive journal might provide "the same kind of data about the *human* instrument that is often provided about paper-and-pencil or brass instruments used in conventional studies" (p. 327). (These days we might refer to computers rather than 'paper-and pencil' but the analogy remains meaningful). With

regard to method, the journal might provide information about methodological decisions and reasons.

Although I did not follow the structured daily approach suggested by Denzin and Lincoln (1985), reflection is inherent in my practice as learner, educator and researcher (Brookfield, 1995; Hughes, 2008; Moon, 2004; Schön, 1987). Throughout this study I reflected on emerging issues and occasionally jotted down reflective memos. At times I shared my reflective responses with supervisors and other research colleagues. My reflective writings and discussions were often triggered by *critical incidents* relating to the research. I came to think of significant new ideas (sudden flashes of inspiration) as *critical realisations*. The previous section entitled reflection, offers an example of how my reflective approach supported the ongoing development of the research.

Conclusion

Chapter 5 has outlined the study's implementation, showing the *expanded critical incident approach* applied in practice. After describing the study's five phases, I presented the *research framework,* which demonstrates the inter-relationship of this quilt-like study's key concepts and research strategies. Finally, drawing on *naturalistic* principles (Lincoln & Guba, 1985), I demonstrated the trustworthiness of the study and its findings. The following Chapters 6 and 7 present the study's findings. Together, the two chapters create a multifaceted word picture of international students using online resources, and identify important information literacy learning needs. In keeping with the *expanded critical incident approach*, the chapters also include condensed sets of *critical findings.*

6
Interactions: International Students Using Online Information Resources

Together, Chapters 6 and 7 offer a multifaceted word picture of international students using online information resources to learn. The findings presented in these two chapters reveal the complexity of the students' resource-using experiences. They respond to the two research questions: first, by describing how international students use online resources; and second, by identifying their associated information literacy learning needs.

Setting the scene, Chapter 6 is in three parts. In turn, I introduce the international students, situate them in their culturally diverse online-intensive information-learning environment, and detail their *interactions* with online resources for assignments.

A Complex Experience

The findings of this study indicate that *using online information resources to learn* is a complex experience. As the following Figure 6.1 shows, the experience integrates eight elements, namely:
students, information-learning environment, interactions, languages-cultures, responses, reflections, strengths-challenges, and *information-learning.*[5]

[5] The eight elements emerged in the course of analysing data gathered for this study.

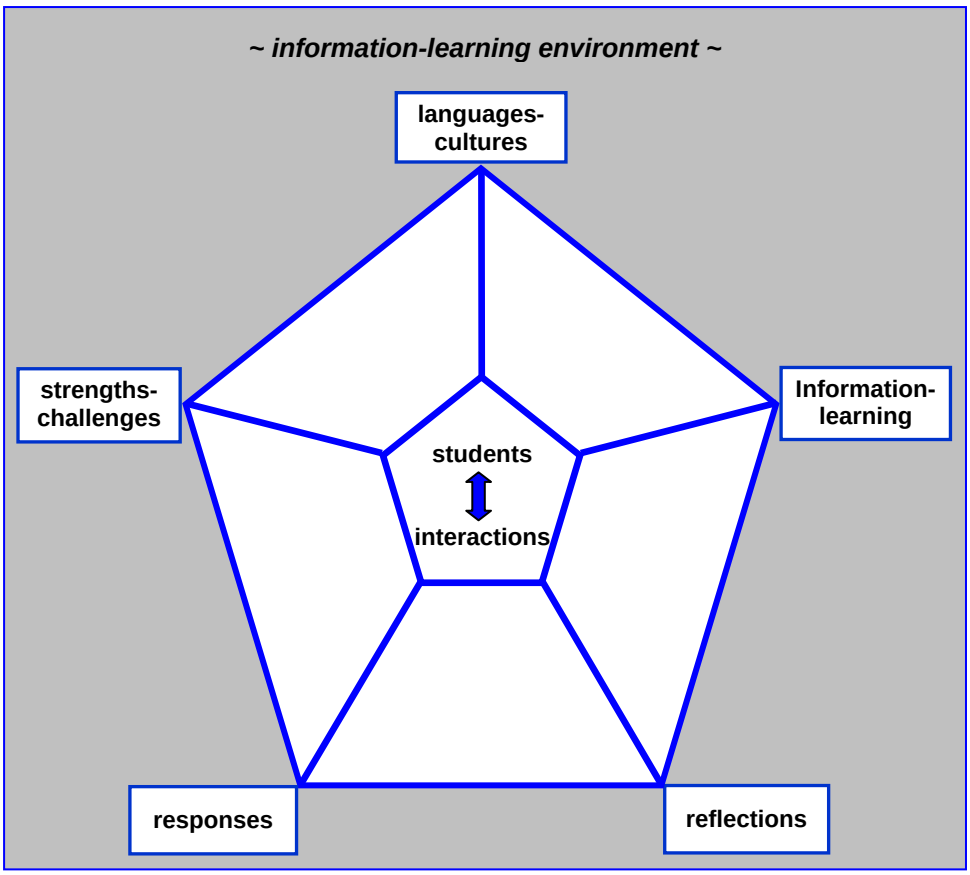

Figure 6.1 Elements of international students' experience of using online resources to learn

The eight elements shown above are inter-connected and are of two types. *Essential elements* are associated with the activity of using online resources. *Incidental elements* are qualitative dimensions, which affect international students' use of online resources. The students' resource-using experiences are further characterised by six recurring themes - or *critical features* – that may be associated with any of the eight elements. These themes are: *diversity, unfamiliarity, overflow, limited support, shared experience* and *imbalance*.

Through Chapters 6 and 7, I focus on each *element* in turn, gradually building a multifaceted picture of the international students' resource-using experiences. At the end of each section, I offer a set of *critical findings* about the respective *element*. The *critical findings* take the form of a three-row table, with each row highlighting a key aspect of the *element*, as follows:

- (1st row) *Using online resources:* summarises key findings about each element, with regard to the international students' use of online resources
- (2nd row) *Critical features:* highlights principal characteristics (or thematic qualities) of each element

- (3rd row) *IL learning needs:* identifies related information literacy learning implications

In this way I respond to the study's two research questions:

RQ 1: *How do international students use online information resources for learning?*

RQ 2: *What are their associated information literacy needs?*

This Chapter 6 presents findings about the three essential elements, namely: *students, interactions* and *information-learning environment*. In the first section, I introduce the international students whose experiences this study investigate.

Introducing the International Students

This research features twenty five international students, who were attending either Central Queensland University Brisbane International Campus (CQU-BIC) or Queensland University of Technology (QUT). The students were characterised by their personal, cultural and linguistic diversity. They included male and female, undergraduate and postgraduate students, aged between 20 and 50 years. The students came from fifteen different countries across Asia, Europe (including the United Kingdom), the Middle East, India and South America. Collectively, they spoke about 20 different languages. Apart from a British national who only spoke English, all the students spoke at least two languages (including English); several spoke three or more languages, and a student from Sweden spoke seven. The students' common language was English, although not all used English as an additional language. Two students from India counted English as their principal language, while two Malaysian students reported English as an equal first language, along with Bahasa Malaysian, and Mandarin.

The following Table 6.1 introduces the students by their pseudonyms[6], and identifies their home countries, their Australian university and level of study (undergraduate or

[6] I used pseudonyms to convey the individuality of students, whilst preserving their anonymity. I created the pseudonyms were by taking the first letter of the participant's first name, plus two different letters (for example, Hilary might become Hew). They were intended as short mnemonics, rather than to convey any personal characteristics. I chose 'names' rather than numbers (for example, Participant 1) to respect and draw attention to the individuality of each international student.

postgraduate). [Appendix C provides further details].

Table 6.1 Pseudonyms and home countries of the international student participants

CQU-BIC STUDENTS			QUT STUDENTS		
Pseudonym	**Home country**		**Pseudonym**	**Home country**	
Amy	Poland	p/g	**Alf**	China	p/g
Ann	Israel	u/g	**Ali**	Indonesia	u/g
Bev	Taiwan	p/g	**Ela**	China	p/g
Cal	Malaysia	u/g	**Han**	India	u/g
Jim	Malaysia	u/g	**Jan**	Malaysia	u/g
Kim	Thailand	p/g	**Lia**	China	p/g
Len	Mexico	p/g	**Liz**	Singapore	u/g
Mak	Japan	u/g	**Lyn**	China	p/g
Nik	Japan	u/g	**Mat**	India	p/g
Pat	Taiwan	p/g	**Sam**	India	p/g
Pete	England	p/g	**Sun**	Palestine	p/g
Rod	China	u/g	**Tom**	Vietnam	p/g
			Van	Sweden	u/g
12 CQU-BIC students - 6 undergraduates, 6 postgraduates			**13 QUT students - 5 undergraduates, 8 postgraduates**		
note: p/g = postgraduate, u/g = undergraduate					

As the above table shows, the **12 CQU-BIC** students were evenly distributed between undergraduate and postgraduate courses, and between Information Technology and Business or Management degrees.

Of the CQU-BIC postgraduates:

- 1 was studying for an Information Technology degrees
- 5 were studying for a Business or Management degree

Of the CQU-BIC undergraduates:

- 4 were studying for an Information Technology degree
- 2 were studying for a Business degree

The **13 QUT students** were enrolled in a wider range of courses.

Of the QUT postgraduates:

- 7 were studying for a Management or Business degrees
- 1 was studying for Master of Learning Innovation (Faculty of Education)

Of the QUT undergraduates:

- 1 was studying for Bachelor of Information Technology
- 1 was studying for Bachelor of Business
- 1 was studying for Bachelor of Mass Communications
- 1 was studying for Bachelor of Nursing

All the students, except Ali[7], were within the first eighteen months of study at either CQU-BIC, or QUT. This was their first experience of studying at an Australian university. As Appendix C shows, most had come straight to Australia from their home country, although seven students had completed some preliminary education at an Australia institution, as follows:

- Senior years at an Australian high school (Rod)
- Technical and Further Education (TAFE) college (Nik and Len)
- English language college (Mak, Ann, Bev and Len)

Diversity of attributes and experiences

The students had diverse educational and professional backgrounds. While Rod, Van and Pat were recent school-leavers, most students fell into the 20-30 year old category and had some previous higher education experience. On the other hand, two older participants, Nik and Pete (aged 30-40 and 40-50 respectively), had not undertaken previous higher education. They reported various personal and professional experiences which included: soldier (Ann), professional golfer (Nik), mother and economist (Han), salesman (Mak), academic (Tom), builder (Pete), language teacher (Len), computer programmer (Van), customer service manager (Amy), auditor (Sun) and accountant (Sam, Mat). Several students, such as Sun and Nik, have travelled or worked outside their home countries prior to arriving in Australia. Van has enjoyed a one year working holiday in Australia before enrolling in Bachelor of Information Technology at QUT.

[7] At the time of data collection, Ali was enrolled as a Masters (Research) student at QUT, having previously completed Bachelor of International Business and Economics at QUT. However, for data collection purposes, Ali discussed her experiences as an undergraduate, during her first 18 months at QUT.

The students' motivations for undertaking their courses in Australia were equally diverse, as the following examples show:

- planned career enhancement (Pat, Bev, Len, Sun)
- English language improvement (Pat)
- experiencing life in Australia (Van)
- boosting family's economic well-being (Han)
- preparing for doctoral research (Tom)
- regaining parents' respect (Mak)
- gaining permanent residency in Australia (Rod)

The following five vignettes (Table 6.2) illustrate the **diversity** of attributes and experience among this group of international students.

Table 6.2 Five vignettes illustrating the diversity of the international student participants

Nik is well travelled and used to mixing with people of differing cultural backgrounds. On completing high school in Japan, he became a professional golfer. For about ten years he worked and competed at clubs in his home country and also participated in what he described as minor golf circuits in the United States. This experience, coupled with his upbringing in a bilingual Japanese-German speaking family, helps him adjust to life in Australia. In addition to Japanese and German he speaks near fluent English. Nik sees his main challenge as a student relates to beginning tertiary education at a relatively mature age (approximately 35). He feels it would have been as difficult in Japan as in Australia to adjust to full-time study, given his lack of academic interest while at school and lengthy period since completing secondary education.
Sun was born in Palestine, but his family is currently based in Jordan. On the day of his interview he is disturbed by news of serious bomb attacks which caused damage in the area around his family's home. As a child he lived for a while in Vienna and learned German. After graduating from university he developed a successful career with an international accountancy firm, working in several Middle Eastern countries and London. He came to Australia to study because he believes it is important to 'fix on the broader picture', given globalization trends. At QUT he is surprised by the expectation of 'self study and research' and 'excessive use of online learning' and exposure to online sources of information.
Pete is a mature-age student (mid-forties), with a previously limited formal education. He grew up in England and left school at 15 to join the army. Later, after a succession of jobs in the building industry, he formed his own construction company. It became a successful venture, eventually allowing him to take a break from work for full-time study. A change in family circumstances and desire for a different lifestyle brought him to Australia. Until recently, Pete saw no point in study, preferring to work and enjoy his social life. Consequently he finds his recent adjustment to study very difficult. In particular, he is unused to the concept of self-directed learning and expresses frustration that lecturers do not 'get on with it' and tell him what he needs to know.

This is **Pat's** first experience of higher education. On leaving high school in Taiwan she worked for six years with an accountancy firm, first in financial analysis and later in human resources. She received all her training from her manager. She came to realise that she needed a degree to improve her career prospects. She decided to study in Australia to improve her English, believing this would enhance her chances of getting a well paid job. Pat is finding study in Australia very different to what she had experienced at school in Taiwan. In particular she is not used to students 'having a conversation' with the teacher. In Taiwan, she says, the teacher talks and the students write; if they have a question they look in a book or consult their friends rather than ask the teacher. Although her school had a library, she did not use it because students were not required to do research, just write answers on homework sheets.
Mat is an MBA student from Madras, where he worked as an accountant since 1987. Having initially been trained to use manual systems, he had later managed IT implementation projects at the bank where he worked. However, he rarely used the internet for work, apart from email. He describes his study experience in Australia as a 'huge generation leap' compared with India where education seems like 'a one-way sort of street', 'the teachers would teach and we would learn', with a high dependence on textbooks and memorization. His previous study was: 'pre – IT generation… We'd have to study material which we would go through in advance and then go for the lecture and take notes … and at best lectures would have a writing board … And textbooks of course … there was no … computer work learning.'

As the above vignettes show, the five students' personal and professional experiences were quite varied. For example, Nik and Sun had both grown up in bilingual homes, and had extensive, but different experiences of living and working outside their home country. While Nik (a former professional golfer) and Pete (a former building contractor) were embarking on higher education for the first time, Sun had previous tertiary qualifications and an already established professional career as auditor.

The five students' accounts also suggest some *shared experience*, associated with unfamiliar learning approaches in Australia. For example, Sun was unfamiliar with independent or "self-learning", while Pat and Mat were unused to participating in class discussion. Significantly for this study, Mat and Sun both referred to challenges associated with aspects of online learning. Pete had the apparent advantage of English as principal language, but like Nik and Mat, he encountered particular challenges in adjusting to study as a mature age student.

Transition to life and study in Australia

Most of the international students in this study described challenges in their transition to life and study in Australia, similar to those of many other people moving between social, cultural and educational environments (Anderson, 1994; Furnham, & Bochner, 1986; Mullins, Quintrell, & Hancock, 1995; Robertson, Line, Jones, &

Thomas 2000; Ryan, 2005), including domestic students making the transition from school to university (Nelson & Kift, 2005). Thus, the international students often expressed a sense of strangeness or aloneness, especially during the early stages. For example, Tom said:

> *It seemed to me that I dropped from another planet to the earth ... very, very isolated … and no friends to help.*

Moreover, students were sometimes concerned about their family or circumstances in their home country. For example, during his interview Sun expressed anxiety about bomb attacks that had occurred the same day close to his home in Jordan.

Most of the 25 international students were using English as an additional language, for their every-day communication and learning. Consequently, they described various language-related challenges. For example, Han mentioned confusion caused by the common use in Australia of slang and swear words:

> *Australia is used a lot of* ***short words*** [slang] *… they always use this word, like "ten bucks, twenty bucks". But it's not so in India. … We use the simple English, not the* ***strong one*** [swear words] *… But the people here, it is their routine … They are using both words in their daily life.*

Students sometimes experienced communication challenges associated with the varying accents and unfamiliar speech patterns of lecturers and fellow students. For example, Liz said she was unused to "the accent of Australian English", while Tom explained that prior to Australia he was unused to hearing native English speakers:

> *We focus on the writing and grammatical items, so that's why I have a lot of difficulties in speaking and listening to native speakers, and also because in Vietnam … I had very little … opportunity to talk to foreigners.*

In addition to the complexities of geographical relocation, many students found themselves in an unfamiliar information-learning environment in Australia. Although some experienced similar variations in educational context to those reported in the literature (Ballard, 1987; Mullins, Quintrell, & Hancock, 1995; Ramsay, Barker & Jones, 1999; Robertson, Line, Jones, & Thomas, 2000; Ryan, 2005), the impacts varied from one individual to the next. For example, Len said he was confused by

teaching and learning approaches which were “completely different” in Australia, where he found the teachers expected him to solve his own problems:

> *First, the technique of the teachers, the lecturers here completely is different. The* ***lecturers came here teach the class****. If it you understand, it’s their problem…****If you don’t understand, it’s your problem****.*

Tom also experienced difference in teacher-student relationships, but unlike Len, he found lecturers in Australia to be more approachable than in his home country.

> *In my country … there is a distance between lecturer and student. But in* ***here I can talk to my lecturer****, I can question my lecturer and I can show my different ideas and the lecturer can sometimes say ‘oh I don’t know, I don’t know that one’ … I can express what difference I have and ask for help … But* ***in Vietnam usually the student dare not come to talk to the lecture.***

Students often encountered unfamiliar classroom practices. While Lia (from China) was intimidated by other students’ outspokenness in class, Len (from Mexico) complained that his international classmates were “too timid” to engage in discussions.

Some students found the emphasis on online learning challenging. Thus Sun said he was surprised by the:

> *excessive use of online teaching … previously we didn’t have that much access to online learning.*

Consequently, students were generally unfamiliar with academic online resources. For example, Sam commented:

> *different teaching styles. I’d never used these types of resources. You can’t compare India and here.*

Sometimes, in addition to unfamiliar educational practices and technologies, the students needed to make personal adjustments. Mat, for example, was grappling with aspects of his cultural and professional identity, and finding that his energy levels were “not as high as a 20 year old”. He said that returning to study after 20

years was “traumatic”, especially as he had gone against professional norms in his country:

> *There had never been an instance of an employee leaving midway through a career to go to Australia to … study. So culturally it is something that raised a lot of eyebrows.*

For his current course, Mat found that he needed to adopt new working practices, which involved large amounts of reading. His professional work had involved “talking to people on the telephone, emails, attending presentations, maybe reading executive summaries”. In contrast, he now found he was:

> *the person who was supposed to do all the work, and sit in a classroom for three hours and not talking all the time, being an active listener.*

Previous information and library use

Study in Australia generally involves independent information use. However, before coming to Australia the students’ independent use of information resources for study was generally quite limited, and mostly text-based. As Appendix C shows, eighteen of the twenty five students had used some type of library in their home country. However, their previous library use was generally quite limited, and several reported that they had used the library more as a place to study than as an information source. For example, although Mat had his company’s library for work purposes, he had not used a library for study purposes. Jim and Cal mentioned that they used a library for leisure reading (fiction and comics). In contrast, Tom, an Education lecturer from Vietnam, had used his university library “a lot” for research. However, Tom said that his library had only provided access to printed resources, almost exclusively Vietnamese books and journals, while:

> *the journal, in English research, we didn’t have that.*

The students’ unfamiliarities and uncertainties often extended to their study-related information use. For example, Lyn avoided using QUT Library because it was very different to a Chinese library and she was “not familiar with the system”. Tom said he “didn’t dare” to ask for help with IT problems early in his course, due to embarrassment about his perceived poor English.

Some students were used to teacher-centred learning approaches supported by set texts, with little previous cause (or opportunity) to independently engage with information resources. Consequently, in their Australian courses some students were challenged by the range of information resources and multiple formats available to them.

The students' previous use of online information resources

Most of the students had used some type of online information resource before undertaking study in Australia, as the following Table 6.3 shows. However, there was a marked difference between the students' previous high use of the Internet, compared with minimal use of academic resources, such as journal databases or library catalogues.

Table 6.3 Students' previous use of online resources

	Internet – used for study	**Internet – used for personal/ work**	**Internet – not used**	**Journal databases**	**Library catalogue– used**
CQU-BIC undergraduates (n =5)	**5** (Cal, Jim, Mak, Nik, Rod)			**2** (Jim - Japanese database; Rod - *Electric Library*)	
CQU-BIC postgraduates (n=6)	**2** (Amy, Bev)	**2** (Len, Pat)	**2** Kim, Pete		**3** (Amy, Kim, Len)
QUT undergraduates (n=5)	**2** (Jan, Liz)	**3** (Ali, Han, Van)		**1** (Liz - *ProQuest*)	
QUT-BIC postgraduate (n=6)	**4** (Alf, Lyn, Sam, Sun)	**2** (Mat, Tom)			
Totals	**13**	**7**	**2**	**3**	**3**
note: 3 students did not discuss previous online use: Ann (CQU-BIC u/g), Ela & Lia (QUT p/g)					

Of the 22 students who discussed their previous online use, 20 students had used the Internet. However, only about two thirds had used it for study purposes. The other third had used it for personal and/or work purposes, including email and *MSN* (online forum). In contrast, only three students had previously used a journal database. Liz had previously used *ProQuest*. (2008). Rod reported that he had used databases while at TAFE in Australia. Although he could not remember their names, he thought one might have been *Electronic Library*. [Rod was possibly referring to *Electric Library,* which was not available at his Australian university]. Mak said that

he had used Japanese databases before coming to Australia, but was not familiar with those at CQU. Only one student had used a library catalogue. Sun had regularly used *Copernic Agent Professional* (2007), a proprietary business database, for his work and had accessed online journals with it.

The patterns were generally similar between students from CQU-BIC and QUT, apart from the following three points:

- greater study-related use of the Internet by CQU-BIC undergraduates
- greater study-related use of the Internet by QUT postgraduates
- greater use of a library catalogue library catalogue by CQU-BIC students

The patterns for undergraduate and postgraduate students across both institutions were also quite similar, although the undergraduates reported slightly greater study-related use of both the Internet and academic online resources. Notably, the two students who had not used the Internet were both postgraduates, while all three of the students who had used a journal database were undergraduates. However, the three students who had used a library catalogue were postgraduates (at CQU-BIC).

Critical findings: The international students

The following Table 6.4 presents *critical findings* about the international students. It is in three parts. The top row (*Using online resources)* indicates the key finding, that the international students reported limited previous use of online resources for study. The shaded middle row (*Critical features)* highlights the students' principal characteristics. The bottom row (*IL learning needs)* identifies key considerations for information literacy learning development.

Table 6.4 Critical findings: The international students

	CRITICAL FINDINGS: THE INTERNATIONAL STUDENTS
USING ONLINE RESOURCES	**Limited previous use of online resources for study**
CRITICAL FEATURES	**Diversity** ➢ Personal attributes ➢ Cultural and linguistic backgrounds ➢ Educational experiences ➢ Professional and life experiences
	Unfamiliarity ➢ With academic online resources ➢ Learning and teaching approaches ➢ Social environment, Interpersonal relationships
	Shared experience ➢ All students - Undergraduate students - postgraduate students - similar previous information-using and learning experiences - similar transition challenges
IL LEARNING NEEDS	**Information literacy learning needs** ➢ To support students' transition to life and study in Australia ➢ To develop familiarity with academic online resources ➢ To develop familiarity with learning and teaching approaches - self-directed, research-based learning

The findings show that the international students brought *diverse* personal, cultural-linguistic, educational and life experiences to their information use and learning. The great majority had used the Internet for personal purposes and about two thirds had used it for study. However, irrespective of country of origin, language and life experiences, very few of the students had used academic online resources or a library catalogue. Therefore, there is evidence of *shared experience*, between undergraduate and postgraduate students, with similar patterns of previous resource and of *unfamiliarity* with academic resources and educational practices. The findings identify information literacy learning needs to support students' transition to life and study in Australia, enabling them to develop familiarity with academic resources and self-directed learning.

The Students' Information-Learning Environment

Situated at either CQU Brisbane International Campus (CQU-BIC) or Queensland University of Technology (QUT), the students were immersed in culturally diverse information-learning environments. However, there was marked difference in the nature and size of CQU-BIC compared with the QUT campuses.

In 2005 a total of 26,126 students were enrolled at CQU across 10 campuses (CQUniversity Statistics and Analysis Office (n.d.). Of these, 14,227 (54%) were international students. CQU-BIC catered exclusively for **1291** international students from over 50 countries. In contrast, the QUT participants were integrated into a student population of Australian resident and international students. QUT's total student population in 2005 was 38, 527 (QUT, 2008b). Of these, 5272 (**14%**) were international students. There were 21,110 internal students at the Gardens Point Campus where 11 of the study's participants were enrolled and 10,524 internal students at the Kelvin Grove Campus where 2 of the study's participants were enrolled (QUT, 2008b).

QUT Library's collection was correspondingly larger than that of CQU Library. In 2005, QUT Library held 706,804 non-serial items across 5 campuses while CQU Library held 338,604 non-serial items across 10 campuses. The CQU-BIC Library held some 2,500 books, but the international students also had access to the whole QUT Library collection via a reciprocal borrowing scheme. QUT Library's expenditure on electronic resources was $3,149,965 compared with CQU Library's expenditure on electronic resources of $683,171 (CAUL, 2008).

The following Table 6.5 shows a representative selection of online (and print) information resources available to students at CQU-BIC and QUT. As evident from this table, the students at both institutions had access to a wide array of online learning materials, activities and information sources, via their Library web sites. Online resources available to students at both universities included in-house publications, such as lecture notes and online tutorials, and external subscription-based sources, such as encyclopaedias and databases. In addition to subscription-based academic resources, students had access to myriad online resources of variable quality via the Internet.

Table 6.5 Selection of print and online information resources available to students at CQU Brisbane International Campus and QUT

CQU-BIC Library http://www.library.cqu.edu.au	QUT Library http://www.library.qut.edu.au
• Library collection – approx 2,500 items (books, videos & CD-ROMs) - search/access via CQU Library online Catalogue • Approx 71,000 items via QUT Library	• Library collection – approx 71, 000 items (books, videos CD-ROMs, DVDs etc) - search/access via QUT Library online catalogue
• Print national and local newspapers • Online national, international, local newspapers • Online newspaper database: *Lexis/Nexis*	• Print national and local newspapers. • Online national, international, local newspapers • Online newspaper database: *Factiva*
• No print journals • Online journals – abstracts & full-text articles • Online journal databases included: - *Proquest, Emerald, Infotrac, Academic, ACM digital Library, IEEEE*	• Print journals. • Online journals – abstracts & full-text articles • Online journal databases included: - *Proquest, Emerald, EbscoHost, ACM digital Library, IEEEE*
• Specialist databases including: - *ABS* (Australian Bureau of Statistics), *AUSTLII* (Australasian Legal Information Institute), *Connect 4* (Australian company annual reports), *CCH* (legal & business info), *Global Monitor* (market research)	• Specialist databases including: - *ABS* (Australian Bureau of Statistics), *AUSTLII* (Australasian Legal Information Institute), *Connect 4* (Australian company annual reports), *CCH* (legal & business info), *Global Market Information Database, EIU country data (economic forecasts)*
• e-books	• e-books
• *Online Reference* - links via CQU Library web page to dictionaries, encyclopedias, government info etc – academic and general resources	• *Electronic Reference* - links via QUT Library web page to dictionaries encyclopedias, government info – academic and general resources
• *CRO (Course Resources Online)* - required readings)	• *CMD (Course Materials Database* - required readings)
• *Compass* online tutorial	• *Pilot* online tutorial
• World Wide Web, Web 2.0	• World Wide Web, Web 2.0

Central Queensland University (CQU) and Queensland University of Technology (QUT) Libraries both provide client support services, with assistance offered in-person, by phone and online. Their policies support the development and implementation of extensive **information literacy education** programs across their respective university communities.

The recently renamed CQUniLibrary's web site (n.d.) indicates that it "offers collaborative and innovative information literacy programs to students regardless of location and their mode of study". In addition, the *Vision statement* in the *2006 CQU*

Library learning and teaching plan (CQU Library, 2006) indicates a commitment to supporting the learning community by:

> devising strategies to improve skills and scholarly practice in complex contemporary information environments. [The Library] will endeavour to make available relevant and timely information literacy education to students and staff of the University. Information literacy programs will, where possible, be integrated with the curriculum, attain quality learning outcomes and develop transferable skills. A variety of programs will be developed to provide a range of learning opportunities and to make the most effective use of staff and student time and resources.

QUT Library promotes an educational model which integrates three learning and teaching strategies for information literacy development (QUT Library, 2009). These strategies are described as *extracurricula* (supplemental), *intercurricula* (integrated) and *intracurricula* (embedded). While the three strategies overlap, each one involves a different pedagogical approach to suit differing needs and circumstances. The underlying principles are outlined in the *Learning for life* framework, while their application is supported by the QUT Information Literacy Syllabus (QUT Library, 2009).

Since 2007 QUT's Division of Technology, Information and Learning Support has operated a collaborative model that links academic skills and info literacy learning. Peacock (2008) offers the following rationale for this integrated approach:

> Both discourses overlap in a number of critical concept/skills areas and are founded on a principle that these skills are most effectively learned and applied when blended with the learning and teaching of other critical skills (such as critical thinking and problem solving) within the context of a discipline. Both share commonalities in goals, principles and praxes which centre on embedding these literacies as key capabilities into the whole learning experience.

Notably, professional library staff are responsible for point-of-need support and ongoing learning. This innovative approach aims to respond to changing imperatives to allow more extensive, flexible support for students (Peacock, 2008). Its potential for supporting language and cultural learning of international students would warrant further consideration.

Critical findings: The students' information-learning environment

Critical findings about the international students' information–learning environment are presented in the following Table 6.6.

Table 6.6 Critical findings: The students' information-learning environment

	CRITICAL FINDINGS: INFORMATION-LEARNING ENVIRONMENT
INFORMATION-LEARNING ENVIRONMENT	**The students' information-learning environment is** ➢ Culturally diverse ➢ Online intensive **Their universities offer extensive information literacy education programs**
CRITICAL FEATURES	**Diversity** Culturally diverse learning environment
	Shared experience ➢ Undergraduate students - postgraduate students are immersed in a common information learning environment
IL LEARNING NEEDS	**Information literacy learning needs** ➢ To access support for information using and learning in a culturally diverse learning environment

The international students were using information and learning in a culturally *diverse*, online-intensive environment. They were physically located at one of two Australian universities (CQU-BIC and QUT), whilst also negotiating the virtual world of online information and learning. Although the CQU-BIC and QUT campuses varied greatly in size, the international students had the *shared experience* of access to a similar range of online information resources via their library web site and the wider Internet. Both university libraries offered policies and practical strategies which aimed to support information literacy learning across the curriculum.

Online Information Resources the Students Used

Turning now to the students' *interactions* with online information resources[8], this section reveals <u>what</u> online information resources they used for a recent assignment. It highlights variations - or *imbalance* - between students' assignment information needs and their actual online information resource use. While the students needed a variety of information and had access to a range of online

[8] *Online information resources* is used in this thesis as a collective term for *online materials* (such as: e-books, web pages, journal articles, podcasts) and *online tools* (such as: library catalogues, journal databases (eg. *ProQuest*) and search engines (eg. *Google*). See Table 0.1 for further definitions.

information resources via their library websites, they used general Internet resources more than academic online resources.

The students' varied assignment information needs

During the semi-structured interviews, the students discussed their use of online information resources for a recently completed assignment[9]. After describing the nature of the assignment, the students completed a *Resources checklist* (Appendix E), reporting their assignment information needs. From their reports it became evident that the students' information needs varied, depending on the assignment topic and requirements. In addition most students needed multiple kinds of information for the one assignment.

The following Table 6.7 outlines the varying assignment information needs of undergraduates and postgraduates, at CQU-BIC and QUT. *Band 1* indicates the most commonly needed information and *Band 6* the least commonly needed information for each group. [Individual student needs are shown in Appendix H, and aggregated by kinds of information in Appendix J. The band 1-6 rankings in Table 6.7 reflect the percentages shown in Appendix J].

[9] The assignments described by the students were different, but all involved the use of online information resources.

	UNDERGRADUATES			POSTGRADUATES			TOTALS		
	CQU-BIC (n=5) [10]	QUT (n=6)		CQU-BIC (n=5)	QUT (n=8)		Undergrads (n=11)	Postgrads (n=14)	All students (n=25)
BAND 1	- Statistics	- Academic info - Background information - Definitions - Statistics		- Company information - Statistics	- Background information - Current news - Definitions		- Statistics	- Background information	- Background information - Statistics
BAND 2	- Academic information	- Company information - Current news		- Background information	- Academic information		- Academic information	- Current news	- Academic information
BAND 3	- Background information - Current news - Definitions	- Legal information		- Academic information	- Company information - Legal info - Statistics		- Background information - Definitions	- Academic info - Company info - Definitions - Statistics	- Current news - Definitions
BAND 4	- Company information - Legal information			- Current news			- Current news	- Legal information	- Company information
BAND 5				- Definitions			- Company information		- Legal information
BAND 6				[Legal information – not needed]			- Legal information		

Table 6.7 Assignment information needs of undergraduate and postgraduate students at CQU-BIC and QUT

[10] Assignment information needs data is not available for Rod, since he did not respond to the relevant interview question.

Overall, the students' **greatest needs** (band 1) were for *background information* about the assignment topic and *statistics* (17 students), followed by *academic information* (16 students), then *current news* and *definitions* (15 students). Just over half the students required *company information* (13 students), while a quarter required *legal information* (7 students).

The students tended to need similar kinds of information for their assignments across the four groups (CQU-BIC undergraduates, CQU-BIC postgraduates, QUT undergraduates, CQU-BIC postgraduates). However, their **priorities varied**. For example, while students of all groups needed *academic information*, the need for this type of information varied between band 1 for QUT undergraduates and band 3 for CQU-BIC postgraduates. While the need for specialist information, such as *company* and *legal information* varied depending on individual assignment topics, there was a consistent need for *statistics* and *current news* among students of all four groups. In particular, *statistics* were a top priority for CQU-BIC and QUT undergraduates, and for CQU-BIC postgraduates.

The relatively high need among all students for **background information** on the assignment topic might be expected. However, the generally lower priority of **academic information** - especially among the CQU-BIC and QUT postgraduates - is more surprising, given the academic context of the students' information use.

As Appendices H and J show, most of the students needed **multiple types of information** for their assignments. Thus, for example:

- Jim (CQU-BIC undergraduate) needed: *Definitions, Background information, Statistics, Current news* and *Academic Information*
- Ela (QUT postgraduate) needed*: Definitions, Background information, Current news, Legal information* and *Company information*

79% of all the students used 4 or more different types of information for their assignment. Postgraduate students at both universities tended to need a greater range of information types than undergraduates.

Having established that students <u>needed</u> a varied range of information for their nominated assignments, in the following section I outline the online resources that the students actually <u>used</u> to gain the needed information.

Overview of online resources the students used for assignments

In their resources checklist (Appendix E) the students reported that they used a **variety of online resources**, as well as books, to gain information needed for their assignments. For example, Len explained:

> *I am not the kind of person that likes to just base in textbooks … I like the meat from electronic resources, from textbooks, some articles, so with this variety the lecturer can see I am getting information from different [sources]*.

Individual students' use of online resources is detailed in Appendix K, while this section summarises:

- the types of *online materials* used by all 25 students
- the particular *online tools* with which the students searched for, and accessed, *online materials*

Types of online materials used

As the following Table 6.8 shows, the students gained information for their nominated assignment using five main **types of online materials**: general (freely available) Internet sites; specialist information publications, such as company reports and statistical compilations; academic articles; news articles; online reference sources, such as dictionaries and encyclopaedias (subscription-based and free access).

Table 6.8 Online (and print) materials used by students for a recent assignment

ONLINE MATERIALS USED	CQU-BIC STUDENTS		QUT STUDENTS		
	Undergrad (n=6)	Postgrad (n=6)	Undergrad (n=5)	Postgrad (n=8)	Total (n=25)
General Internet sites	6	6	5	7	**25**
Specialist information sources	3	6	5	6	**20**
Academic articles	4	5	3	5	**17**
News articles			2	5	**7**
Online reference			1	2	**3**
e-books					**0**
PRINTED MATERIALS USED					
Books	2	5	3	7	**17**

The patterns of online resource use were generally quite similar between CQU-BIC and QUT students. In particular:

- All the students used general Internet sites
- All except one student used at least one other type of material, in addition to general Internet sites
- At both universities, postgraduates tended to make greater use of all types of online material except that:
  - general Internet sites were used by 100% of all students
  - specialist information sources were used more by QUT undergraduates (100%) than QUT postgraduates (75%)
- 17 (68%) of all the students used printed books in addition to online materials, but none used e-books

Varied types of online tools used

For their nominated assignments, the students used **six main types of online tools** to search for information, and to access online materials, as follows:

- Internet search engines, such as *Google* (2008) (freely available)
- Journal databases, such as *ProQuest* (2008) (subscription-based, available via the students' library website), or *ERIC* (n.d.) (freely available and subscription-based), or *Google Scholar* (2008) (freely available)
- Specialist, discipline-specific databases, such as Australian Bureau of Statistics (2008) database (subscription-based, available via the students' library website) and *AUSTLII* (2008) legal database (freely available)

- Online reference sources, such as *Oxford reference online* (2009)(subscription-based, available via the students' library website) or *Wikipedia* (2008) (freely available)
- CQU or QUT Library catalogue (freely available)
- CQU or QUT Library in-house databases, such as course materials databases (available via the students' library website)

Multiplicity of online tools used

Appendix K shows that all the students used **several different types of online tools**, both *general* and *academic,* for their assignments. For example, Nik (CQU-BIC) used the search engine *Google* and the journal database *ProQuest*. Over half the students (undergraduates and postgraduates alike) used three types of online tools. Thus, while all except Sun used an Internet search engine such as *Google* or *Yahoo*, none relied exclusively on a search engine.

As Appendix L shows, in addition to using several types of online tools, many students used **multiple search engines or journal databases**. For example, Lia (QUT postgraduate) used search engines *Google* and *Yahoo,* journal databases *ProQuest* and *EBSCOhost.* Just under half (11) of the students used two different search engines for their nominated assignment, while over half (15) of the students used two or more journal databases. The postgraduate students at both universities tended to use a greater number of search engines and journal databases than the undergraduates. However an undergraduate used the most (4) journal databases.

Particular online resources used

The students at CQU-BIC and QUT tended to use a similar, quite limited range of **online tools** to access information needed for their nominated assignments, as outlined in the following Table 6.9.

Table 6.9 Particular online tools used by students for a recent assignment

ONLINE TOOLS USED	CQU-BIC STUDENTS		QUT STUDENTS		
	Undergrad (n=6)	Postgrad (n=6)	Undergrad (n=11)	Postgrad (n=14)	Total (n=11)
Search engines	6	6	5	7	**24**
Google	6	5	5	7	**23**
Yahoo	2	2		5	**9**
Infoseek		1		1	**2**
AlltheWeb		1			**1**
Journal databases	4	4	3	7	**20**
ProQuest	4	4	1	6	**15**
Emerald		5		4	**9**
EBSCOhost			1	4	**5**
Infotrac		2			**2**
Blackwell Synergy			2		**2**
ACM				1	**1**
APAIS		1			**1**
CINAHL			1		**1**
ERIC				1	**1**
Medline			1		**1**
Google Scholar			1		**1**
Specialist databases	3	4	5	4	**16**
ABS (statistics)	3	2	2	2	**9**
AUSTLII (legal)			2	1	**3**
EIU (economic forecasts)			2		**2**
Company websites	1		1	1	**3**
Connect 4 (company)		2			**2**
CCH (company)				1	**1**
Bloomberg terminal (via QUT Business Faculty)				1	**1**
Keloggs University (via QUT Business Faculty)				1	**1**
ASX (Aus Stock Exchange)			1		**1**
delisted.com (company)				1	**1**
Government websites				1	**1**
CQU/QUT Lib databases	3	4	4	5	**16**
CRO/CMD (course resources)	3	4	4	5	**16**
QUT e-prints			1		**1**
Library catalogue			2	5	**7**
Online reference			1	2	**3**
Wikipedia (WWW)			1	1	**2**
Online dictionary (WWW)			1		**1**
CQU/QUT Library (subscription)				1	**1**
Other	1	2		2	**5**
Email (eg. Hotmail)		2		1	**3**
Online chat (eg MSN)		1			**1**
Phone				1	**1**
Copernic (own subscription)				1	**1**
Encyclopedia Britannica (own CD)	1				**1**
Newspaper database (eg. Factiva)					**0**

As the above table shows, the students made relatively greater use of *general online tools* (freely available via the Internet) compared with *academic online tools* (via CQU and QUT libraries). Thus:

- all except one student (Sun)[11] used a general Internet search engine
- the most commonly used *online tool* overall was the *Google* search engine (23 students)
- the most commonly used *academic online tool* was the *ProQuest* journal database (15 students)

The students indicated **various reasons** for selecting particular online tools. Some students associated particular types of information with particular types of tools, as Alf's comment suggests:

> *If I go to **database** it's about like information, the **journal articles**, the **current news** or something like that, so when I go to the library I go to find out the **theories in books**.*

Sometimes a student's selection was based on familiarity with a particular tool, such as the *ProQuest* journal database, or *Google.* In other cases, their selection reflected unfamiliarity with academic resources generally, or misconceptions about particular types. Linguistic or cultural aspects also influenced students' choice of a particular resource. Thus, several students used *Google* because it offered a translation tool or the facility to search in their principal language. Rod expressed reservations about using the Internet because he thought Internet information was sometimes "hidden" and thus unavailable to him:

> *In the internet search … I don't know how they **hide their information** so the search engine just won't find it. Now I know some of the … Chinese website … have quite a couple of the good article, but when I went to the … Google to search they won't find it … Before I thought … search engines should be searching everything.*

The following sub-sections describe the students' use of particular online resources.

Internet resources and search engines

The students' greater use of freely available Internet resources and search engines, compared with academic materials and databases, accords with evidence of similar

[11] Sun used the subscription-based *Copernic,* instead of an Internet search engine.

tendencies among students elsewhere (Australian Bureau of Statistics, 2006; OCLC, 2005; Pew Internet and American Life Project, 2007). The comments of this study's participants indicated that their high use of the Internet for their assignments was associated with:

- ease of using the Internet
- broad information base offered by the internet
- their familiarity with the Internet
- the international coverage of the Internet and support of diverse languages

Sam suggested that students used the Internet because they found it easy to use, whilst giving a broad information base. Van also thought that the Internet's wide coverage sufficiently met his information needs, without needing to seek elsewhere:

> *I use more the Google nowadays. It's really well developed I think and you can select exactly what you want if you've got the keywords for what you want to search for … I found* ***sufficient information*** *from the internet … felt that Google was giving me more straightforward answers.*

Some of the students turned to the Internet and search engines because they were the most (or only) familiar resources, as Ali explained:

> *Just out of habit that I've just been using Google … whenever I want to search something … my typing just goes straight to Google*.

In addition, some students mentioned benefits associated with the Internet's international coverage, which allowed them to access information about countries and cultures which was less readily available from other sources. For example, for his assignment, Tom drew on information about the education system in his own country from the Vietnamese government's web site. Moreover, Internet search engines offered useful features for students who were using English as an additional language. Thus, Len and Rod searched for information in their own language, using their country's version of *Google*. Lia and Jan both mentioned that *Google*'s cache facility made it easier to scan search results since it highlighted where their search terms occurred in the body of a selected web document. Len used *Google's* translation tool to assist his comprehension of web documents. Nik also found the 'near hits' feature of the former *Ask Jeeves* search engine (Ask, 2009) useful for identifying synonyms as alternative search terms:

*When I get stuck with the **vocabulary** it sometimes gives me … similar words, different … it **is like an extra help**.*

Despite the increasing popularity of Web 2.0 sources over the last five years (Alexander, 2006; British Library / JISC, 2008; Miller, P. 2006; Oblinger, 2008) only two students used *Wikipedia* (2008), and none mentioned wikis, blogs, or social networking sites such as *MySpace* (2009) and *Facebook* (2008). Similarly, only one student used *Google Scholar* (2008) to source academic articles. Although the data collection period for CQU-BIC students (2003-4) predated the present spread of Web 2.0, social networking was becoming widely popular by 2006 when I interviewed the QUT students. It is possible that while discussing their information use, the students did not associate Web 2.0 resources with serious study. Alternatively, they may have been reluctant to mention using 'non-academic' resources.

Unlike the other students, Sun reported a preference for the subscription-based *Copernic Agent Professional* (2007http://www.copernic.com/en/products/agent/professional.html) over popular search engines and academic online resources. Familiarity played a part, since Sun had used *Copernic Agent professional* previously in his work and he thought it was more efficient to continue using a familiar, proven resource rather than spend time learning new ones:

I always use Copernic … I still have the available databases on QUT, but [I] don't have enough time to actually explore the … links and how things work on that website … [Copernic] is like a short cut, rather than going through QUT database.

In addition, Sun was prepared to pay to use this internet search and tracking tool, since he considered that it offered access to a wider range of information than general Internet resources:

When you search the internet using Yahoo or Google … that's like 10 per cent of the available resources on the internet, which is the visible part, but if you use Copernic you get access to the 90 per cent, or the invisible part … You get pretty amazing results … It's an extremely powerful tool - rather than going individually to Google and then getting frustrated and not finding anything … you can easily customise the search … it's for everything … you think of like encyclopaedia, business directories, news, magazines, shopping, the general Web.

Journal databases

The majority of the students used journal articles for their nominated assignments. For example, Tom explained that he used journals because they:

> *give me some very updated information and different perspective from different writers … if I want to seek for some very strong and powerful supporting idea, I get it from journals*.

Despite the wide selection of journal databases available to the students via their library websites, they tended to use a limited range of multidisciplinary databases such as *ProQuest* (15 students) and *Emerald* (9 students). Within a particular database, such as *ProQuest,* they tended to search broadly across its entire contents, rather than select discipline-specific sub-sets, such as *ProQuest Computing* or *ABI/Inform Global*. Only three students mentioned using subject-specific journal databases: Van, an IT undergraduate, used *ACM digital library*; Tom, an Education postgraduate, used *ERIC;* and Han, a Nursing undergraduate, used health sciences databases *Medline* (2009) and *CINAHL* (2009).

There was an evident tendency for students to use a particular database on the basis of its familiarity or previous recommendation, as illustrated by Ali's comment:

> *[Proquest] was the first thing that* ***the librarian showed me*** *… it covers a very big range of … topics.*

Pat explained that she had always used *Emerald* after finding it met her information need on first use:

> *The first time [I] use the Emerald, I can find the definition – so second time I will try – every time I can find it.*

Moreover, unfamiliarity was evident in some students' misconceptions about journal databases. For example, although the *Emerald* and *ProQuest* databases both offer thousands of full-length articles and reports, Kim said that she used *Emerald* because it gave "a lot of information", whereas *ProQuest* gave limited information: "just short one - not many sentence".

Some students' choices were apparently influenced more by particular database features, than considerations about the quality of information it offered, or its

appropriateness for the topic. Thus, Len preferred *ProQuest* (2008) to other journal databases due to visual appeal, and a search function that offered “options for similar articles”:

> *I used it [ProQuest] for assignment 3 weeks before… get more articles, more accuracy … And I feel is* ***more friendly, the colours***.

Specialist information and databases

Although many students required specialist information such as statistics, legal and company information, relatively few used **specialist databases**. For example, of the 17 students who reported the need for statistics, 8 used the Australian Bureau of Statistics database (2008). Of the 14 seeking company information, 2 used *Connect 4* (n.d.) and 1 used *CCH* (n.d.). Only 2 of the seven students needing legal information used *AUSTLII (*Australasian Legal Information Institute, 2008). One student used *EIU CountryData* (n.d.) to source economic information.

Some students met their specialist information needs by using a general Internet search engine, or another familiar online source, rather than one of the specialist tools available via their university library. For example, when seeking company information, some students went straight to individual company web sites, or to the *ASX* (*Australian Securities Exchange*) (2007) and *Delisted.com* (2007) sites. Sam, an MBA student, supplemented information from journal databases and specialist library-based sources, with the Bloomberg Terminal (for live financial data) and the Kellogg School of Management database, which were available to him via the QUT Business Faculty.

Online reference sources

CQU-BIC and QUT libraries offer a wide variety of subscription-based dictionaries, encyclopaedias and other authoritative online reference sources via their websites. However, only Tom (QUT) reported using any of them. Instead, Jan used a free web-based dictionary, Jan and Sun used the free-access *Wikipedia* (2008) and Rod used his own CD-ROM version of *Encyclopaedia Britannica.*

In-house resources and library databases

Of the online tools produced by the CQU and QUT libraries, the *CRO* and *CMD* course materials databases[12] were most commonly used (by 10 postgraduates and 4 undergraduates). One student used QUT e-prints to access articles.

Books and the library catalogue

In addition to online sources, the majority of the students used books for their assignments. For example, Sam commented:

> *For this particular assignment I probably got around* ***twelve or fifteen books, a huge stack of books****, borrowed them [from the library].*

The students indicated various reasons for using books, including:

- convenience
- to gain an overview of the topic
- to gain theory relating to the topic

Sam commented on the convenience and relative ease of using books:

> *You've got the time to go through the book and just go to the index and just see if the particular topic that interest for you. It's there, okay keep it, or just give it back.*

Sometimes the students used books as a starting point, to gain an overview of the topic. For example, Tom stated:

> *I will use the textbooks in some areas [if] I need to get* ***general background*** *about some things.*

Han explained that books helped her gain an initial understanding:

> *Without books I cannot understand the work … I get it … from my textbooks, from other books, and then I go to the journal database … I get idea from the book*.

[12] *CRO – Course Resources Online* at CQU-BIC; *CMD – Course Materials Database* at QUT

Lyn used books to identify the main points of the topic for developing the structure of her assignment, before seeking scholarly articles. Jan started with books for an assignment about the gap between rich and poor in Australia between 1986 and 2000. When she was unable to find books that fully covered this period she moved to the Internet.

Some students associated books with particular kinds of information. For example, Alf explained that he used books to find theory:

> *If I go to database it's [for] information, the journal articles, the current news or something like that, so when I go to the library I go to find out the theories in books.*

In contrast to the high use of print books, no students used e-books, although an extensive range of e-books was available, free of charge, via their library catalogue and the Internet. This seemed to be a further indication of students' unfamiliarity with online resources, since several students expressed misconceptions about e-books. For example, Sam said:

> *Basically for e-books, stuff is* ***not really that much available****.* ***You've got to pay for them*** *and I am a student, I hate to pay for the books*.

Although 17 students used books, only 7 students at QUT used their library catalogue, while none of the CQU-BIC students used theirs. Reasons for limited use of the catalogue included:

- difficulty in using it
- preference for browsing the library shelves

A few students also stated that they found their library catalogue difficult to use. For example, Ann commented that it was "too sophisticated". Cal found it confusing that the catalogue included functions such as "renew loans" as well as listing books. Nik added that most of the resources listed in the catalogue were held at other CQU campus libraries "which is not as relevant to me". Sometimes students at both CQU-BIC and QUT preferred to browse the library shelves rather than use the catalogue. At CQU-BIC the preference for browsing seemed to be associated with the relatively small size of the library collection and the proximity of library staff. Thus, Kim described how a librarian went with her to the shelf to locate a book. Nik said he could find resources without needing to use the catalogue:

If it's programming I go to the programming section, pretty much know where it is. If it's … management … I go to the management section.

Other online resources

The students used few online resources, other than those listed on the *resources checklist* (Appendix E). The exceptions were mainly business-related sources, such as company websites (3 students) and the *ASX* (*Australian Securities Exchange)* (2007) (1 student), the Bloomberg Terminal (1 student), *Copernic Agent Professional* (2007) (1 student) and the Kellogg School of Management database (1 student). Three students used personal contacts as information sources, via online chat or email. Len commented about MSN:

You have contacts … all over the world. So if you have one question about some country you just say 'guys, excuse me …'

Alf pointed out that in addition to seeking information from his friends, MSN allowed him to chat with them and so "reduce the press[ure], to sometimes relax".

Imbalance of information needed and online tools used

The findings outlined above reveal several discrepancies – or an **imbalance** - between the students' stated information needs and their actual resource use. While the students <u>needed</u> a variety of information for their assignments, they actually <u>used</u> a limited range of online resources to gain the needed information, as the following Table 6.10 shows.

Table 6.10 Comparison of assignment information needs and online tools used by the students

	INFORMATION NEEDS & ONLINE TOOLS USED	CQU-BIC STUDENTS		QUT STUDENTS		
		Undergrad (n=6)	Postgrad (n=6)	Undergrad (n=5)	Postgrad (n=8)	Total
INFO NEEDS	Academic *articles*[13]	3	4	3	7	**17**
	Research findings	3	3	5	4	**15**
TOOLS USED	Journal database	4	6	3	8	**21**
INFO NEEDS	Background information	2	4	4	7	**17**
	Definitions	2	2	4	7	**15**
TOOLS USED	CQU/QUT Library Online reference	0	0	0	1	**1**
	Wikipedia (WWW)	0	0	1	1	**2**
	Online dictionary (WWW)	0	0	1	0	**1**
INFO NEEDS	Current news	2	3	3	7	**15**
TOOLS USED	Newspaper database	0	0	0	0	**0**
INFO NEEDS	Specialist information, eg:					
	Statistics	4	5	4	4	**17**
	Company information	1	5	3	4	**13**
	Legal information	1		2	4	**7**
TOOLS USED	Specialist databases, eg:					
	ABS (statistics)	3	2	2	2	**9**
	CCH, Connect 4 (company)	0	2	0	1	**4**
	AUSTLII (legal)	0	0	2	1	**3**

Despite the students' stated need for a variety of academic and specialist information, they made greater use of general Internet sites and search engines, than academic and specialist online resources. This *imbalance* is evident as follows:

- Despite relatively high needs for specialist information (such as statistics and company information), the students made relatively limited use of specialist databases, such as Australian Bureau of Statistics (2008) or *CCH* (n.d.)

[13] Although *academic articles* are categorised elsewhere in this thesis as *online material*, they are included here since many students mentioned them as 'needed information'.

- Although 17 students required *background information* and 15 students needed *definitions,* only 5 students used *online reference sources* (freely available or via library website)
- Although 17 students reported using books, only 7 QUT and no CQU-BIC students used their library catalogue
- Although 15 students needed current news, only 7 used newspaper articles, and none used a newspaper database, such as *Factiva* (2008)

It is possible that the students gained sufficient information, or current news, for their assignments from general Internet sources without using academic or specialist tools. However, by using academic or specialist sources they might have gained information of greater depth and quality, appropriate for a university assignment.

Critical findings: Information needed - Resources used

Summarising this section, the following Table 6.11 presents *critical findings* about the students' assignment information needs and the online resources that the students used for their nominated assignments.

Table 6.11 Critical findings: Interactions (Assignment information needs and resources used by the students)

	CRITICAL FINDINGS: INTERACTIONS (INFORMATION NEEDED - RESOURCES USED)
USING ONLINE RESOURCES	**Information needed** ➢ The students needed a variety of information for their assignments
	Online resources used Students most used: ➢ General Internet sites and search engines (*Yahoo, Google*) ➢ Journal articles and multidisciplinary databases (*ProQuest, Emerald*) ➢ Books Students least used: ➢ Specialist information sources ➢ Online reference ➢ Newspaper database
CRITICAL FEATURES	**Imbalance** ➢ Between information students needed ~ Online resources students used
	Unfamiliarity ➢ With the range of academic resources available - evident also in misconceptions about particular resources
	Shared experience ➢ Undergraduate students - postgraduate students - information needed and of range of resources used
IL LEARNING NEEDS	**Information literacy learning needs** ➢ To raise students' awareness and use of greater range of academic and specialist online resources

This section has revealed an apparent *imbalance* between the kinds of information the students <u>needed</u> for their nominated assignments, and the online resources they <u>used</u>. While the students needed a variety of information and had access to a wide range of academic online resources via their CQU or QUT Library website, they made most use of generally available Internet sites, via search engines such as *Google* or *Yahoo.* Moreover, the students tended to use general purpose, multidisciplinary databases, such as *ProQuest* or *Emerald*, rather than a discipline-specific database, such as *ProQuest Computing* or *ACM digital library.* The resources used were generally appropriate to the students' broad information needs. However, by relying mainly on more general sources, the students overlooked academic resources of potential benefit to their study.

The students' use (and non-use) of particular online resources was apparently associated with *unfamiliarity* with the extensive range available (especially academic

resources). Various student comments suggested a tendency to rely on already familiar online resources, rather than to explore a more extensive range. In addition, the students' unfamiliarity with particular resources was sometimes associated with misconceptions, such as: 'theory' is (only) found in books; one particular database is always best; and students need to pay to use e-books and databases.

In most respects, the findings reflect similarity – or *shared experience* – between CQU-BIC and QUT students, and between undergraduate and postgraduate students. While the postgraduate students tended to use a greater range of academic online tools than postgraduates, they still relied most heavily on general Internet resources and multidisciplinary tools such as *ProQuest.*

From the **information literacy learning** perspective, the findings of this section indicate a need to raise international students' awareness and use of a wider range of academic and specialist online resources. However, the quantity of online resources used is not necessarily an indicator of successful use of online resources. For example, a student's use of multiple resources might be associated with difficulty in identifying a suitable online tool, or in navigating particular databases. Consequently, the following section outlines findings about how the students used online resources.

The Students' Approaches to Using Online Resources

Juxtaposing researcher observations with student commentary, this section describes the students' approaches to using online resources for a practical task. By outlining the students' *successful interactions* with online resources, I show that overall the students were moderately successful in using online resources at a basic level. In general, when using online resources during the task, the students were more successful in applying basic search techniques, and less successful in planning and evaluating information strategies. Their overall approaches were quite unstructured and uncritical.

Overview of the online task

Twenty[14] of the study's participants carried out the online task during the semi-structured interviews. The online task[15] represented a simulated assignment – or *critical incident* - for the students. The topic was: *Compile an annotated bibliography on effective public speaking techniques for business*. The students needed to search for and select suitable publications using three types of online resources: a library catalogue, a journal database, and an Internet search engine. The task was designed to be open-ended, in order to gain 'real life' indications of how the students used online resources for study. Consequently, individual students tackled the task in different ways (and not all students completed all parts of the task).

After observing the students carry out the task, I evaluated their approaches using the criteria shown in the *Interactions checklist* (Appendix M). The evaluation data are detailed in Appendix N. This section summarises the task evaluation, by identifying the students' successful interactions with online resources. The accompanying student comments, recorded as the students carried out the task, add explanatory detail. While the findings highlight successful (or effective) aspects of the students' resource use, by extension they indicate less successful aspects, and identify further information literacy learning needs.

Defining interactions

In the context of this study, *interactions* are understood to be instances of the students' active, learning-related use of (online) information resources. For example, *interactions* include: developing a search strategy, entering search terms, and evaluating online materials.

Interactions relate to particular elements (or *phases*) of the *online information use cycle*, which is represented by the *Reflective online information use model* (Hughes, Edwards & Bruce 2007) [16]. This model represents an "ideal" information using

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[14] For various reasons five of the participant group did not carry out the online task.
I observed 20 students using their library catalogue and a search engine, and 17 students using a journal database.

[15] The implementation and analysis of the online task is described in Chapter 5.

[16] This model is discussed further in Chapter 8 and shown in Figure 8.3.

approach, as a continuous and balanced cycle of four interconnected phases: *Plan, Act, Record* and *Reflect*. The four phases are summarised in Table 6.12 below.

Table 6.12 Four phases of the Reflective online information use model

FOUR PHASES OF THE REFLECTIVE ONLINE INFORMATION USE MODEL
Plan: involves **developing information use strategies** - for the overall approach (meta-cycle) - as well as particular *interactions*, such as: defining the assignment topic, determining information needs, and identifying search terms
Act: involves **implementing information use strategies** - includes interactions such as: accessing online tools, entering search terms, and applying search techniques
Record: involves **organising the results of information strategies** - includes interactions such as: downloading/saving/printing online materials
Reflect: involves **evaluating information strategies, their implementation and results** - critically reviewing the overall approach - evaluating online materials

Successful – or *balanced* – online information use is characterised by a strategic and reflective approach that extends across all four phases of the online information use cycle (as outlined in the above table). Thus planning and reflection underpin the whole process of using online information, as well as particular *interactions* such as *identifying search terms* (*Plan*) or *evaluating online materials (Reflect)*.

The *Reflective online information use model* (Hughes, Bruce, & Edwards, 2007) provided the framework for evaluating the students' *interactions* with online resources during the online task. The findings of the evaluation are outlined below.

Findings of the online task

In general, when carrying out the task, the students demonstrated moderately successful resource use. About half the students successfully carried out most *interactions.* However, there was evidence of some *imbalance* in their approaches, between successful application of basic techniques, and limited planning or critical reflection.

The following Table 6.13 summarises the students' successful *interactions* (which are detailed in Appendix N). Due to the open-ended nature of the online task, I describe the results in proportional terms, as follows:

- One tick indicates that *a few students* - about a quarter - demonstrated successful interactions
- Two ticks indicates that *some students* - roughly a half - demonstrated successful interactions
- Three ticks indicates that *many students* - about three quarters - demonstrated successful interactions
- Four ticks indicates that *very many students* - over three quarters -demonstrated successful interactions
- A dot indicates that *no students* demonstrated this interaction (and does not necessarily imply *unsuccessful interaction*)

Table 6.13 Students' successful interactions demonstrated during online task

	INTERACTIONS[17]	Successfully completed
PLAN	develop an overall strategy	•
	determine purpose/information needs	•
	define the topic	✓
	understand topic terms	✓
	identify appropriate search terms: *business*, *public speaking*	✓✓
	eliminate unnecessary terms: *effective*, *techniques*, *annotated bibliography*	✓
ACT	access CQU/QUT Library website	✓✓✓✓
	access online tools (catalogue, journal database Internet search engine)	✓✓✓✓
	enter both search terms: *business*, *public speaking*	✓✓✓
	modify search terms	✓
	apply appropriate search techniques (eg. keyword, subject)	✓✓
	apply advanced search techniques (eg. Boolean; limit by date/resource type)	✓
	select suitable publications from search results - covering *business* and *public speaking*	✓✓
	identify citation details/call number	✓✓
RECORD	demonstrate/explain steps to download/print/save a selected journal article	✓✓
REFLECT	evaluate publication, using at least 2 appropriate criteria - eg. *publication type, currency, authority*	✓✓
	evaluate overall approach	•

The following sub-sections outline the findings of the online task for each of the four phases of the online information use cycle.

[17] In developing these criteria I drew on two information literacy tutorials: *Compass: Library help online* (CQU Library, n.d.) and *Pilot: Your information navigator* (QUT Library, 2006)

Plan

Criteria: The first part of the online task - *Plan* - involved planning online resource use for the topic: *Compile an annotated bibliography on effective public speaking techniques in business.* The *Plan*-related criteria (Appendix M) were as follows:

- develop an overall information use strategy
- determine the purpose and information needs of the topic
- identify appropriate search terms: *business*, *speaking/public speaking*
- eliminate unnecessary terms: *effective*, *techniques*, *annotated bibliography*

Outcome: None of the students demonstrated the development of an overall plan for carrying out the 'assignment', nor did they successfully determine the assignment purpose or their information needs. However, about half the students successfully identified appropriate search terms as business and *public speaking,* although only a few mentioned eliminating unnecessary words, such as *effective* or *techniques,* from their search string. A few students indicated that they were unsure about the meaning of the academic term *annotated bibliography*.

Act

Criteria: *Act* involved using online tools to implement the information use strategy. The *Act*-related criteria (Appendix M) were as follows:

- access the library website
- access a library catalogue, a journal database and an Internet search engine
- enter appropriate search terms (in each of the online tools), that combined *business* and *public speaking,* and eliminated unnecessary terms such as *effective* and *techniques*
- apply appropriate search techniques (in each of the online tools); for example: *select the keyword or subject field*
- apply advanced search techniques; for example, Boolean logic; limit by date/resource type
- select publications from the search results list (in each of the online tools) that cover the topic by integrating both *business* and *public speaking*
- identify citation details/call number

Outcome: Overall, the students demonstrated slightly more *successful interactions* associated with *Act*, compared with *Plan* or *Reflect*. However, they tended to apply only basic searching techniques. Most students seemed familiar with each type of

online tool (library catalogue, journal database and search engine). Their greater use of general Internet resources and *Google (2008)* (reported previously in Table 6.9) was reflected in consistently higher rates of success in accessing and using Internet search engines, compared with a journal database or the library catalogue. Similarly, they tended to select the multidisciplinary journal databases, such as *ProQuest* (2008) and *Emerald* (n.d.) that were previously shown to be commonly used. In some cases, language-related uncertainties contributed to students' unsuccessful *interactions*. The following examples illustrate students' approaches.

Accessing and selecting online tools: All except one student successfully accessed their library website, and very many successfully accessed the three main types of online tools (library catalogue, journal databases and Internet search engine). However, two CQU-BIC students, who appeared unfamiliar with their library website, were unsuccessful in accessing their library catalogue. Instead of clicking on a link to the CQU Library catalogue, they followed a link to *Other library catalogues,* from where they clicked on a link to *Local library catalogues.* Then, one student selected Brisbane City Council Libraries, while the other selected Griffith University Library.

Very many students selected a suitable journal database for the task topic, showing the general preference (noted in the preceding section) for the multidisciplinary databases, such as *ProQuest* (2008) or EBSCOhost (2009). However, Van selected *ACM digital Library* (2009) which was familiar to him as an IT student, but was less well suited for a topic about public speaking in business.

Entering search terms: Some students successfully combined and entered appropriate search terms *public speaking* and *business*. Less successfully, a few students entered a whole phrase from the topic. For example, Mak entered *effective public speaking in business* and Han entered *speaking techniques for business* (without enclosing the term in inverted commas, or using the 'phrase' search option).

A few students used less successful search terms that did not meet the task criteria. For example, students sometimes entered only one of the two required terms, which generally led to the retrieval of publications that covered only *business* or *public speaking*, rather than public speaking for a business context. In other cases, students' use of less suitable search terms suggested possible misunderstandings about the topic itself, or about the meaning of terms in its title. For example, Kim

entered the term *business technology.* Later in the interview it became clear that Kim had confused the topic word *technique* with *technology*. There was also some evidence of unfamiliar academic jargon causing confusion, whereby both Pat and Kim entered the term *annotated bibliography* in the library catalogue, thinking it was the principal subject of the topic (rather than its intended outcome). Pat explained that she entered the term *annotated bibliography* to find out what it meant, which suggested that she may also have misunderstood the purpose of the catalogue (perhaps expecting it to provide a definition, as *Google* might).

Some students mistyped search terms, for example: *poblic* (*public*) and *buisness* (*business*). Typing errors are common among information users of all backgrounds. However, their impact seemed greater for these students, who mostly used English as an additional language. It was evident that the students did not always recognise misspellings, and a few individuals mistakenly concluded that their unsuccessful search results were due to using a 'wrong' search term, rather than a mistyped but otherwise valid term.

Modifying search terms: A few students successfully improved their search results by modifying their initial search terms, by either correcting spelling errors or adding another term such, as *business,* to *public speaking.* However, other students were unsuccessful in modifying terms, for example by adding *effective* or *bibliography* to existing terms*.* Pat substituted *skill* for *technique* to no avail, since neither term was essential to the main concepts of *public speaking* and *business*. Bev replaced *business technology* with *business technological communication,* without gaining improved search results*.* Although her inclusion of the term *communication* brought the search closer to the required *public speaking,* her continuing confusion of *technology* and *technique* resulted in search results relating mainly to information technology for business purposes.

Applying search techniques: About half the students applied successful, if basic, search techniques. The students generally used the default settings (which are generally pre-set to the Boolean operator *and).* Of the numerous search options available in the various online tools, only the following alternative options were used, by a few students: *limit to full-text* and *limit to scholarly/reviewed journals* (in journal database); *limit by campus* (in catalogue); *subject* or *title* field (in place of *keyword*). In some cases this seemed due to unawareness, or a sense of not needing advanced functions. Ann explained about using *Google:*

I didn't go to the advanced search because I could find the things I wanted to find.

Applying advanced search techniques: Only a few students used more advanced techniques. For example, when entering search terms, a few students enclosed phrases such as *public speaking* in inverted commas, and one student used the phrase field in the advanced search mode of *Google.* A few students separated search terms with a comma, which had no impact on the search result in the catalogue or search engine, but might be effective in some databases such as *ProQuest*. Only a few students successfully typed the Boolean operator *and* between search terms. Less successfully, Lyn initiated a very wide search by inserting the Boolean operator *or* between multiple terms, as follows:
bibliography or *public* or *speaking* or *techniques* or *business*
As a result, Lyn retrieved a large number of articles, many of which were partially or completely irrelevant to the topic.

Selecting online materials: Very many students successfully retrieved a journal article and a web-based publication. Although some successfully described the process for locating a book by call number in the library, a few stated (mistakenly) that it was necessary to place a hold or reserve an item in order to borrow it.

About half the students were successful in selecting publications that covered *public speaking* for a *business* context, such as:

- *Business and professional speech communication* (from catalogue)
- *Growth and leadership: Effective public speaking in business presentations* (from search engine)

Partially successful selections of publications about general public speaking, rather than business-specific public speaking, included:

- *How to make presentations with confidence and power* (from catalogue)
- *Presentation tips from the pros* (journal database)
- *The secret to successful public speaking* (journal database)

Although most publications selected by the students were at least partially relevant, a few were off-topic for various reasons, which included less successful searching techniques and linguistic misunderstandings. The two following examples illustrate unsuccessful selections.

Ann entered *public speaking* in the *title* search field in the CQU Library catalogue. From the results list she selected the title:
The pathfinders: Women of non-English ***speaking*** *background with white collar education in the* ***public*** *sector*.
Although both words of her search term appeared in the title of the selected publication, they were unconnected to each other and to the required topic.
Comment: Had Ann put inverted commas around "public speaking" when entering the search terms, her results might have included more relevant titles.

Lyn entered the terms *public, speaking,* and *technique** on three separate lines in the (default) advanced search screen of EBSCOhost (2009). Apparently by random from the results list, Lyn selected an article from the journal *German History* entitled: *Mass politics and the techniques of leadership* (Corey, 2006)
Comment: Although Lyn entered valid search terms, the article was not relevant to the topic. The article was not principally about *public speaking,* although the search terms all occurred prominently, but separately, somewhere in the article: *technique* appeared in the title; *public* [*opinion*] appeared in the abstract; and *speaking* appeared in the article text.
Lyn's use of the asterisk truncation symbol was unusual among this group of students. It suggested that Lyn was aware of some advanced searching strategies, perhaps without fully understanding their application. In this case the asterisk would not affect the search outcome since the only likely extension of *technique** is the plural, which the database protocol automatically allowed for.

Identifying citation details: There was noticeable variation in students' recognition of citation details for selected publications. About half successfully identified publication titles in the catalogue or a journal database, however only a few students successfully identified subject headings. Many identified the call number (in catalogue records). Many students successfully identified a journal abstract and explained its purpose.

Record

Criteria: *Record* involved organising the results of information strategies. The *Record*-related criteria (Appendix M) were as follows:

- demonstrate or explain how to download, print or save a selected journal article

Outcome: About half the students successfully explained how they would print or save an article. (None demonstrated unsuccessful *Record* interactions).

Reflect

Criteria: *Reflect* involved evaluating the selected publications, as well as critically reviewing the whole information use approach. The *Reflect*-related criteria (Appendix M) were as follows:

- evaluate publication, using at least two evaluative criteria[18] (such as document type, currency or authority)
- evaluate overall approach

Outcome: About half the students demonstrated **successful interactions**, using at least two evaluative criteria. For example, Han commented about an article:

> *We know … that the* ***author here is a researcher****. He is not a simple man …* [He is] *from Oxford University too and this means that it has weight in it …* [published in] *2006 or 3, means he's alive, he's* ***in the present****.*

Bev recognised the academic nature of an article because:

> *They use more difficult* ***vocabulary*** *… more* ***referencing*** *… maybe more than 20 or 30 because they have to cite different people, use different way to talking about this topic.*

The following two examples illustrate students' different but critical approaches to evaluating online materials.

Kim said that she looked through as many search results as possible, even though this gave her "too much information", especially in *Google*. She based her selection on the quality of information provided in the abstract and introduction:

> *I get the article - I read … first-introduction or abstract…that can guide me what it will [be] talking about in journal - if [it is] not the thing I'm looking for - get another one*.

[18] CQU Library (n.d) and QUT Library (2006)

Van took a quite analytical approach, checking to:

> *See how my keywords have been highlighted on each result - and the closer the topic seems to be what I'm looking for and it seems to be a serious website, then I will click on it and go and have a quick scan.*

On the other hand, some students demonstrated less successful interactions, applying a single criterion, or less reliable criteria. For example, Jan evaluated a publication on the basis of publisher:

> *I think I would get that book because it's from McGraw Hill, which is … a well known publisher*.

While a few students considered the number of references to be indicative of quality, others were swayed by word length. For example, Bev judged an article to be acceptable on account of its brevity: "This article is OK because just 387 words". In contrast, Ela commented: "I know more [words] means better". However, neither length nor brevity would necessarily indicate an article's quality.

Visual aspects were also important considerations for some students. Van considered that the blocks of contrasting colours of one website indicated that it was "less serious". While most students selected resources on the basis of perceived assignment needs, Ann was concerned to select publications that would create a good impression: "so it would look good in the references".

A few students selected publications without evaluating them. For example, Ela selected a web publication because it was: "the first paper that pops [up in] Google". Similarly, Nik randomly selected a journal article that proved unsuccessful according to the task evaluation criteria. The article, entitled *Everything you want to know,* was a review of a business reference book. The first paragraph stated that "Warren Buffet got his start in life by investing $100 in a Dale Carnegie course on public speaking" (Wooldridge 2002), but otherwise the article was unrelated to the topic.

The students expressed varying opinions about the Internet as an information source for their assignments. Ela apparently considered all material on the Internet to be reliable:

> *I always believe they are writing real stuff … I trust the information*.

Although Van suggested that the quality varied between general and academic resources, he considered Internet resources to be generally acceptable:

> *Maybe it's [the Internet] not like within the university but I mean it is still research*.

However, Sun demonstrated caution in selecting information from *Wikipedia* (2008), considering other users' critical feedback and the writer's authority:

> *They do have feedback on certain articles, so probably that would give you a kind of indication how reputable the author was … whether you should trust his or her writing or point of views.*

Overall approach

As explained earlier in this section, successful – or *balanced* – online information use is characterised by a strategic and reflective approach that extends across all four phases of the online information use cycle (Hughes, Bruce & Edwards, 2007). None of the students demonstrated or described such a balanced approach.

The students' overall approaches, as evidenced by the online task and interview accounts, were generally quite unstructured and uncritical. Students sometimes indicated that they spent considerable time and effort gathering information for assignments. For example, Lyn stated that she read about 40 journal articles for an assignment that required at least 12 articles, while Pat said:

> *For an assignment I need to prepare five, four day to find information, to find books that are useful for my topic.*

However, time spent does not necessarily indicate a successful approach. For example, when discussing a recent assignment, Rod described a seemingly haphazard series of *Act*-related events, which were time-consuming yet lacked planning or reflection:

> *I did spend time on … finding the book* **[Act]** *and I didn't find what I'm looking for* **[Reflect]** *so I went to the…CD Library* **[Act]** *and can't find it as well…When I go to the internet search I went up to the database site* **[Act]** *and they have a lot of article but they ask me for the username and password … You have to pay otherwise they won't give you the username…so I can't log in - because I did that before … So I went to the*

bookshop **[Act]** *… The book is quite expensive … nearly a hundred … so … no. OK, search from the internet* **[Act]**.

The two following examples, provided by two postgraduate students (Tom and Len) illustrate more strategic and critical approaches. Even so, neither student's approach integrated all four Plan-Act-Record-Reflect elements.

Tom developed and then implemented an information plan for his assignment. He carefully evaluated the information he found at every stage and modified his approach accordingly. In this way he combined elements of plan, act and reflect, moving backwards and forwards within the online information use cycle.

I read the abstract and I try to choose the most suitable [items] for my assignment **[Reflect, Act].** *Usually I plan my assignment in advance, in different parts* **[Plan]** *- and I try to search information* **[Act]** *and to complete the ideas - and that's why sometimes I change my plan many times because different information in international mean different things, different perspectives* **[Reflect, Plan]** *… I read some of the literature and … find information* **[Act]** *and literature to support my idea. If I find some very good information which show me a different perspective I will change my plan accordingly* **[Reflect, Plan]** *… [To evaluate information] firstly I base on … what kind of article it is … a opinions article, research article or theoretical article* **[Reflect].** *Usually I choose research article* **[Reflect, Act]** *with some findings with imperial [empirical?] evidence, [that] show … very convincing ideas through research and other very theoretical one with some scholar [scholarly approach] and especially … very strong and powerful writing, with different resources of information and references* [**Reflect**].

Len described a quite systematic 'filtering' approach he used to progressively search for, select and process information: The following example, lacks a planning element, but incorporates the *Act*, *Record* and *Reflect*:

If I see the title attracts me … I click and start searching within the page of the website **[Act]** *… sometimes I just start reading – and if I see the first rows are something interesting* **[Reflect]***, I copy-paste in Word … from different websites – like a kind of draft. And I print and I take to my house* **[Record]**. *And now in my house, with calm and a cup of coffee … I start … Highlighting … Throw [away] many information that doesn't work* **[Reflect, Act]** *… These 20 [selected documents] apparently looks good, but at the end is like steps, like filtration, like filter … So second time I separate* **[Reflect, Act]** *… and at the end like 9 articles … From one search 40, I print 20, and I submit 9.*

Critical findings: Resource-using approaches

Summarising this section, the following Table 6.14 presents *critical findings* about how the students used online resources during the online task.

Table 6.14 Critical findings: Interactions (The students' resource-using approaches)

	CRITICAL FINDINGS: INTERACTIONS (RESOURCE-USING APPROACHES)
USING ONLINE RESOURCES	**Students' more successful interactions with online resources** ➢ **Plan** Identifying search terms ➢ **Act** Applying basic search techniques Selecting suitable publications ➢ **Record** Printing, saving articles ➢ **Reflect** Evaluating online materials
	Students' less successful interactions with online resources ➢ **Plan** Developing overall information use plan ➢ **Act** Applying advanced search techniques: Boolean, search fields, search limiters ➢ **Record** (n/a) ➢ **Reflect** Evaluating overall approach Evaluating overall information use approach
CRITICAL FEATURES	**Imbalance** More successful basic techniques ~ Less successful strategic, critical approaches
	Shared experience ➢ Undergraduate students - postgraduate students - Generally basic approaches - Language-related challenges
IL LEARNING NEEDS	**Information literacy learning needs** Enable students to develop: ➢ Understanding: principles to support practice ➢ More reflective approach ➢ More strategic approach More advanced techniques

The *critical findings* about the international students' approaches to using online resources indicate an *imbalance* between more successful basic techniques and less successful strategic and critical approaches. While carrying out the online task, the students generally demonstrated limited overall planning or evaluation. Moreover, they appeared to experience a variety of challenges in using online resources, including: limited technical experience and online access problems; and keyboarding errors. The findings for the online task showed similarity – or *shared experience* – between undergraduate and postgraduate students, across CQU-BIC and QUT. Although two postgraduates (Len, CQU-BIC and Tom, QUT), described

more balanced information-using approaches, they only demonstrated quite basic interactions during the task.

The findings in this section have important implications for information literacy education. They indicate the students' need for learning approaches that support the development of *balanced* - strategic and critical - information using practices.

The Students' Challenges in Using Online Resources

This section complements the online task findings by presenting the students' perspectives on what they found easy and hard about using online resources. The critical findings for this section reveal various inter-related challenges, *notable online strategies*, and associated information literacy learning needs.

From the students' accounts, I identified five types of challenge, namely: *unfamiliarity*, *overflow*, *access and navigation*, *cultural-linguistic context*, and *limited support*. As I shall explain, these challenges were often inter-related and individuals experienced particular aspects differently. Thus, for example, a few students described *using databases* as *easy*, while others described it as *hard*; and some made no comment. In addition, I outline *notable search strategies* that students adopted to address certain language-related challenges.

Easy and hard aspects

The following Table 6.15 outlines the varied range of hard and easy aspects identified by the students when responding to the interview question:
What did you find easy / hard about using online resources and tools for your assignment? Why?
The first row relates to student attributes, the second row relates to the resources themselves, and the third row relates to the students' *interactions* with resources.

Table 6.15 Easy and hard aspects of using online resources

	EASY ASPECTS	HARD ASPECTS
THE STUDENTS		• not knowing online resources • basic information skills • English language limitations – general & academic • not knowing academic & critical approaches • limited local knowledge / Australian culture • unfamiliarity with CQU/QUT online systems
THE RESOURCES	• online resources provide varied, quality, accurate information • allow continuous access / remote access to information • provide access to current information, news • language used in web pages is easy to understand	• too many resources/databases • too many search options • too much information in resources • too many results • poor quality information • lack of full-text • lack of current information on assignment topics • charges for using online resources • 'hidden' web sites • small text size, hard to read online
USING ONLINE RESOURCES	• using databases • using catalogue • using Internet • using *Google* • searching for statistics • searching for current information & news • copying from online (easier than taking notes)	• using databases • using catalogue • using course materials database • using online forums • understanding assignment topic & requirements • selecting keywords • identifying synonyms • combining terms • differentiating/selecting databases • searching • narrowing a search • searching for statistics • using Boolean operators • handling search results • selecting articles from results list • understanding specialist & academic information • understanding journal articles • evaluating quality of resources • referencing & plagiarism • dial-up/technical problems • printing • emailing results • using the library • finding books

Of the twenty five international students, eight stated that they found online resources generally easy to use. For example, Lia said:

> *Generally speaking I think fine - I don't have much trouble*.

The students reported various features of online resources that made them easy to use for assignments. Easy aspects included the range of information available, and the continuous and remote access to information that they provided. For example, Alf commented:

> *It's got always … **quantity** … if you really want to learn something … it's very easy. **You always can find some conceptions.***

Several students differentiated between types of resources, and reported that they found web resources and *Google* (2008) easier to use than others. Thus, Han said:

> *It's much easier to get the information from the online* [Web] *than from the articles … from the **Internet it's really easy** … **very much easier than the journal article**.*

Ela compared online resources favourably with print materials:

> *I like using them … **because it's easy** … **compared with using books** … because when I put the keyword in … **it immediately show me the things I'm looking for**, but **in book I couldn't do that**, I have to … read through … all the things.*

Hard aspects related both to the quantity and quality of the resources themselves, and to the information they provided. They were often associated with students' self-perceived unfamiliarities and limitations. For example, some students mentioned that they were confused by too many resources, or too much information; and the information found online was variously described as being of poor quality, out of date, difficult to read or expensive to access. In addition, individuals mentioned "not knowing" online resources, information-using skills, or their university's online system. English language limitations (especially academic English and vocabulary) and Australian cultural knowledge were another source of challenge.

While most students reported easy as well as hard aspects, the hard aspects predominated. Even aspects reported as *easy* by some students tended to be described as *hard* by others, for example *using database* and *searching for*

statistics. Consequently in the next sub-section I focus on the nature of challenges that the students experienced.

Outlining the challenges

The students' accounts of what they found hard, revealed five main types of challenges, associated with:

- *unfamiliarity*: with online resources, resource-using techniques, and academic practices
- *overflow*: over-abundance of online resources, and online information
- *access and navigation*
- *cultural-linguistic knowledge*
- *limited support*: to the students in using online resources

Of the above-mentioned challenges, *unfamiliarity* and *overflow* were the most varied and widespread.

Unfamiliarity

Mat likened using online resources to a *voyage into the unknown.* This expression captures students' various challenges associated with *unfamiliarity* of online resources and resource-using techniques, the university's online system, academic practices and the linguistic-cultural context. In some cases, students were simply unaware of what online resources were available. For example, Sam commented:

> *I think **students actually don't know** about some of the informations on there.*

Other students were unfamiliar with the nature of databases, as Mak stated:

> ***I just didn't know how to use … the electronic library** … I didn't even know that database was … privately owned enterprises and that you had to be subscribed to have access to that which is not available on Google.*

Limited familiarity was evident in some students' belief that they needed to pay to use online resources. A few of the students reported difficulties in accessing online resources, due to unfamiliarity with the system, For example, Tom said:

> *For me **the skill, how to use it, how to access it** … (was) really hard in the first place*.

Tom went on to describe how early in his course his unfamiliarity with the library's online system and printing prevented him from accessing required readings:

> *We actually have to access the CMD* [Course Materials Database] *and download the article. [The lecturer] said I would need to do five books and also the online library, online checking to find books and it's interesting because we don't have online library like this* [in Vietnam] *…* ***Almost impossible for me because I don't know how to enter the library online checking for books and journal database*** *… when I manage to enter the CMD … I didn't know how to print it out. I tried the printing machine, but I didn't know that I need a card.*

Overflow

The term *overflow,* which was coined by Nik*,* describes the challenges associated with handling the multiplicity of information types, online resources and strategies that students encounter in their learning-related resource use. Thus, Nik stated:

> *I think most of all is just* ***information overflow****. Hard … how to reach to the right information … too much information.*

Students were sometimes confused by the range of online resources available, which Mat described as 'mind boggling'. Some said that it is difficult to differentiate one from another and as a result they wasted time trying several online tools before identifying a suitable one. For example, Lia said:

> *I find it pretty hard … at the very beginning … because when you search for one subject there might come out ten, or more than ten databases, and* ***I don't know what the difference between each other****.*

Some students reported difficulties in identifying suitable items from lengthy results lists, although another student mentioned that gaining too few results was also hard. Lia mentioned the difficulty of narrowing down a search to gain specific information:

> *You can* ***never narrow it down*** *a specific thing and give you one result****.*** *It always give you lots of results, it's all about how to find one.*

Access and navigation

Students sometimes experienced challenges associated with accessing and navigating online resources. For example, Van said:

> *I know there is a lot of good information there but* ***I just don't really know how to get hold of it.***

In some cases, students experienced technical difficulties in accessing the university system, due to hardware failure or slow dial-up Internet connection. Occasionally, students reported difficulties with printing and emailing information. In addition, Kim pointed out that the library's shorter week-end opening hours sometimes made it hard for her to print online materials:

> *because sometimes is limit time for me to use … because I always search information on Saturday and Sunday - and the library close, computer room close by 5 o'clock.*

On the other hand, Tom found printing expensive and tended to download articles:

> *The cost of printing is very expensive so I will select carefully before printing out, or … probably save a copy into my USB and check at home.*

A few students mentioned that poor interface design made it difficult to navigate online resources. For example, Len commented about his library web page:

> *[There's] too much information …* ***The website you confuse*** *… and you lose all interested … you saturate your brains … quickly*.

Nik, who mentioned a particular difficulty in identifying databases that offered full-text articles, commented that:

> *It takes time to grasp the electronic library, how it works … [to find] databases where you can have access to the whole version or … the abstract.*

While one student found the library catalogue easy to use, others found it hard. Ann commented that the catalogue is 'too sophisticated', with too many links. Nik said that he did not use the catalogue since he found it easier to find books by browsing

the shelves, especially since the catalogue:

> *gives me a whole search for the … other campuses as well … which is not as relevant.*

Several students reported that searching online resources was hard, due to the extensive range of search options and functions offered by online tools. For example, Amy described her confusion about the correct punctuation and truncation symbol to express her search term:

> *I have a problem with … how I should write … these key words - like short name and the full name, or with quoters [quotation marks] … for example, 'organisational analysis', I had a problem if I should write 'organisational' or 'organisation'with star* [asterisk]*, or 'organisation analysis' … the whole expression in quoters.*

A few students mentioned difficulty associated with more advanced search strategies, such as using Boolean operators. Han said:

> *We have to use the 'and/or' Boolean, but I cannot find anything by using [it] … it's most difficult.*

Sometimes students found evaluating and selecting online materials hard. For example Jan said:

> *It is very hard to … identify [whether it] really is written by a lecturer or somebody else. Somebody else might write any article and put on the internet to confuse people and then they might write their own opinions … and sometimes you have … to research the information and you have to identify … is it a true or not true.*

Obtaining selected publications was also *hard* for some students, especially where the database provided the citation and abstract rather than the full-text article. More positively, Mat said he found copying material online was easier than taking notes.

Linguistic-cultural context

As indicated previously, the students were relatively new to Australia, and so were often negotiating a linguistically and/or culturally unfamiliar learning context. Consequently, they sometimes experienced linguistic and culturally-related challenges in seeking information online and applying it to assignments.

Academic online resources tend to be textually based, and consequently using them requires considerable English language facility. To successfully define the assignment topic and identify search terms, the international students needed not only to understand particular words, but to recognise their intended meaning in the context of the assignment. It is noteworthy, therefore, that Cal commented:

> ***Language*** *would be the* ***first barrier****, so a lot of them they may not understand the topic.*

Lia added that identifying keywords was the most important yet "hardest thing". Nik pointed out that finding appropriate synonyms was hard, since it required an extensive English vocabulary:

> *In doing searches, because* ***I only have limited amount of vocabulary****,* ***it's difficult to use alternative words*** *to make the search*.

In addition, as Jim pointed out:

> *It was difficult because* ***a keyword can have many meanings****, some of the articles use this particular word and some others don't.*

Specialist terms and academic written styles caused students some difficulties in understanding assignment topics and online materials. Alf explained:

> *English is not my first language so is cause time and … in some journal article I really don't know what it mean … some words is quite simple but when they're together maybe that … has some special meaning and I don't know what is.*

Examples given of problematic terms included: *downsizing* (Kim), *code cracking* and *reverse engineering* (Nik). Ela said:

> *I look up the dictionary [but] I still don't know what 'corporate governance' means … [nor] 'director's remuneration', because normally we just say 'salary'.*

Jargon used in database instructions and messages also created challenges. For example, when attempting to print online materials from a database Kim was puzzled by an *illegal action* message that came up on the screen:

I try to print and they just say 'illegal' - but I didn't see anything illegal.

Being unfamiliar with the specialist IT sense of 'illegal' (denoting an invalid operation), Kim was concerned that the article, or her attempt to print it, was 'against the law'. Similarly, Pat was challenged by the term 'no hits' (indicating 'no results') for an unsuccessful database search.

Some students reported language-related difficulties in selecting resources. As Rod explained, reading academic articles in English could be demanding and time-consuming:

English I take quite a long time to understand … one A4 page maybe take me half hour … and … my own language, my Chinese, maybe take me five minutes … cause if they using the big words … it costs more time … I'm looking for the dictionary to find out what it means and … sometimes maybe the long sentence you take time to understand … sometimes … no idea what they're talking about.

Similarly, Pat claimed that she was able to scan a document more easily in her own language:

If I use English I can't understand very well or read very fast, but if it is Chinese web site … I can [say] not this page, not this page … I can read fast

Alf drew attention to a subtle language-related difficulty associated with evaluating publications. Whilst usually understanding an article's text written in English, he found it hard to identify the article's quality. In contrast, when reading an article in his principal language:

if I try to find out a Chinese article it's easy for me to read. I can just read through it quickly … [and] I'm sure [if] it's good or not

Students' culturally-related challenges were associated mostly with defining the topic and applying found information. Assumptions about students' cultural or local knowledge, which were inherent in assignment topics, sometimes proved problematic. For example, coming from China, Ela found it hard to comment on Australian law, as required in her business assignment. Similarly Lia felt that she lacked the necessary background for an assignment that assumed knowledge of Australian society:

When we talk about some government or local news, or local companies, I found it is very hard.

In addition, Tom provided the following example:

*I had a difficulty in the **background knowledge** …. [in] one unit … they did talk about the different **educational policies in Australia** … they said there are some **policies about indigenous people** and … the prime minister refused to apologise for some policy **… I had no idea what it means**.*

Similarly, Liz mentioned difficulty in understanding an article which referred to an Australian film:

*If the article is **… in Australian context … I have problem understanding** … because it is a cultural difference. It's not that I don't understand the meaning of the words, it's just that I don't understand the context … there was one article on **Crocodile Dundee**, I don't know about that at all. I don't know about that person at all. **I'd never heard of the movie prior to reading the article** … and I had to read it many times and then … the tutor go through it and then I understand finally what it's all about.*

Several students also mentioned comprehension challenges associated with the use of humour in online materials. Thus, Lyn commented:

The humorous things ... the culture is important here ... maybe some humour, Aussie can understand ... but we don't … But for some Asian ones ... we may think it's really funny, but ... they [Australian students] *can't … understand it.*

Unfamiliar academic practices and conventions also contributed to the challenges some students experienced in applying information gained from online resources. For example, Tom described the difficulty he experienced with the requirement to 'write critically':

A very common term … [is] critical - critical review, critical analyse and analyse critically, critique, criticize … I learn that critical mean that I can show my own opinion about things. I can show this is good, or not good, support my idea with different literature. That is something … completely different … I don't have some of those skills … so in my first assignment I found it really, really hard to write critically.

Students often reported that they found referencing hard, and expressed concerns about copyright and plagiarism. Han commented:

> *The difference is that here it's the plagiarism … we cannot copy the stuff. But India we can … There is nothing, no hard and fast rules for plagiarism for the assignment … in India. But here … I really have to think about it … it's tricky.*

Somewhat ironically, Alf mentioned his uncertainty about whether referring to articles in Chinese would be acceptable to a tutor who does not know the language:

> *I have always doubted, whether can I use … Chinese article to write about [in] the assignments because … I can translate into English and also put a website there, but if the tutor … want to find … the article [they can't]*

Limited support

The students' challenges in using online resources for assignments were sometimes compounded by insufficient guidance, both online and from lecturers. For example, Lia found that the information provided on the library website about databases was poor, causing her to:

> *spend so long time on reading the description of the database*.

Kim stated that the one paragraph given to describe a particular 3000 word assignment did not adequately explain what was required:

> *I [was] just so surprised for the first time when I came here – how can I do it? … For international [students]* ***we don't know exactly what lecturer want*** *– what the lecturer expect from us to put in the assignment.*

The following comment from Mat demonstrated the impact of inadequate assignment information, which contributed to an aborted database search:

> *What didn't help was that* ***the lecturer was not very clear about what was expected****, so he just gave us a very open-ended approach. And it was on a specific subject in the area of human resources management, and* ***I tried getting into the database in the library ... it was not a very successful attempt*** *… between myself and two other team members we spent a fair bit of time trying to locate resources, but we couldn't and we* ***gave up.***

Notable online strategies

Despite – or perhaps because of – the varied challenges outlined above, students often appeared to be quite resilient and motivated when discussing their assignment-related online use. These positive attitudes were particularly evident in the special strategies that some students adopted to address language-related challenges. Some examples of their notable search strategies are outlined below.

Students mentioned several strategies to supplement their vocabulary when determining search terms. For example, Nik used the *near hits* feature of the former *Ask Jeeves* search engine (*Ask*, 2009) to identify synonyms. A few students developed search techniques involving the use of search engines in their principal language. Rod said that he mainly used Chinese *Google*, because it is:

> *easy to … understand … search options … choose the right options … because … at home I using … the Chinese Google … for home page so … make it more easy to understand … And I can search … Chinese [sites] as well.*

Len said that sometimes he first conducted a search in Spanish using *Yahoo Méjico* (Mexican *Yahoo*) to gain a general understanding of a topic, then he repeated the search using English search terms in an English language search engine:

> *Just to get an idea in Spanish … on different topics. Is better to understand your own language and afterward go … looking [in English].*

As a variation on this approach, Alf searched Chinese *Google*, but using English search terms to gain access to English language websites:

> *because my computer system is a Chinese one so … it's … Chinese Google … I type it in English and it will turn out an English website.*

Students adopted a variety of strategies to assist with processing search results, reading and selecting English-language publications. For example, Jan used the cache facility in *Google* (2008) when scanning web documents:

> Y*ou can click on the cache and get a highlight of the words that you search, and it's easy … [to see] which one that related to the one I want, instead of spending the whole time reading.*

Lyn mentioned the usefulness of her online dictionary for determining the meaning of complex terms:

> *One … convenient thing for the database or online resources – in my computer I have the electronic dictionary … I just move the mouse where the particular words, it will show the meaning of the words in Chinese.*

Len sometimes used the *Google* (2008) translation tool when he was unsure about the meaning of particular words or text, although he was cautious of its shortcomings:

> *In Google there's tools that translate the web sites for you. [It gives] Some help … [with] some words I didn't understand … [It] is not correct, but … it give you an idea, [about what] you need to modify…*

Jan found it helpful to gain a better understanding of a topic by reading the online textbook notes that publishers provided in her principal language:

> *I find that there is some textbook where they actually publish on line the notes … is the text book that you order … They translated it into Chinese … I went 'oh, this is good I don't need to look for dictionary or anything', is print out … is totally the same … and I found it was good.*

Comparing easy-hard aspects with more-less successful interactions

There were marked similarities between aspects the students reported as *easy* and *hard*, compared with the *more successful* and *less successful interactions* noted during the online task. Thus, *easy* aspects most frequently mentioned by students related to general Internet resources, which they also tended to use more successfully than other online resources during the online task. Conversely, the predominance of *hard* aspects reported by the students reflected the generally basic information-using approaches demonstrated by the students during the online task. For example, *defining the topic* and *identifying search terms* were the students' most frequently mentioned *hard* aspects; they were also previously identified as *less successful interactions.* Similarly, *s*everal students reported that searching online resources was hard, whilst during the online task the students tended to adopt basic strategies.

Critical findings: Challenges

Summarising this section, the following Table 6.16 presents *critical findings* about the challenges the students experienced in using online resources for assignments.

Table 6.16 Critical findings: Challenges

	CRITICAL FINDINGS: STRENGTHS-CHALLENGES
USING ONLINE RESOURCES	**Students experienced a range of inter-related strengths and challenges in using online resources:** Strengths: ➢ Internet-using skills ➢ Notable search strategies (language-related) Challenges: ➢ Unfamiliar resources and information using practices ➢ Over-abundant information sources and search results ➢ Unfamiliar language ➢ Assumed cultural knowledge ➢ Limited support in using online resources
CRITICAL FEATURES	**Unfamiliarity**
	Overflow
	Limited support
IL LEARNING NEEDS	**Information literacy learning needs** Enable students to develop: ➢ Understandings: about complexity of information and using information to learn ➢ Familiarity: with resources, techniques, academic practices ➢ Strategies: to address information *overflow* ➢ Language: academic English, vocabulary, reading/scanning ➢ Local (Australian) cultural knowledge Enable students' access to: ➢ Support: for using online resources, academic practices, language learning

The international students brought an array of strengths and challenges to their resource use. Most were experienced Internet users, confidently accessing information via search engines. They drew on varied cultural and linguistic traditions, extending potential information sources available to them. As demonstrated during the online task, the students tended to successfully apply basic search techniques. They also described *notable search strategies*, to address language-related challenges. However, they also experienced various challenges, which I described as: *information overflow, unfamiliarity, access and navigation, cultural-linguistic context,* and *limited support.* Therefore, the findings suggest the need for integrated information literacy education that enables international students to develop information-using understandings and practices, in conjunction with academic

practices, English language facility and cultural knowledge for their Australian information-learning environment.

Conclusion

Chapter 6 has outlined the three essential elements of the international students' experience of using online resources to learn. It has introduced the international students and their diverse experiences and attributes, situating them in their online-intensive culturally diverse higher education environment. I have shown that the students bring an array of strengths and challenges to their resource-using and learning. In this way, I have identified considerable information literacy learning needs, to develop awareness of online resources and more critical and strategic approaches to using them. The following Chapter 7 reveals qualitative dimensions of the international students' resource-using experiences.

7
Dimensions and Connections

This chapter reveals the five *incidental elements, or* qualitative dimensions, which in various ways affected the international students' use of online resources[19]. In turn, I outline the students' *information literacy learning and help-seeking*, their *affective* and *reflective responses* to using online resources, and *cultural-linguistic dimensions.* Then, connecting all eight *elements* identified by this study, I present a composite view of the international students' *whole experience* of using online information resources to learn. The chapter concludes with a set of *critical findings* which summarise key aspects of the international students' online resource use, and identify important information literacy learning needs.

The Students' Information Literacy Learning And Help-Seeking

While the previous chapter outlined how the international students used online resources, this section reveals how they learned, and gained help, to use online resources at their Australian university. The findings suggest an apparent *imbalance* between the students' considerable information literacy needs and limited formal information literacy learning, and between their more extensive informal help-seeking and less extensive participation in formal information literacy education.

In the context of this study, *formal information literacy education* signifies planned events and programs, which include library orientations, generic and course-related information literacy classes. *Informal help* signifies ad hoc assistance offered to students, generally on an individual basis, by library staff, teaching staff, and friends. *Independent information literacy learning* signifies student-directed learning to use information, which includes using an online tutorial or a printed guide. Findings presented in this section relate to individual student data provided in Appendix P.

[19] See Table 0.1 for definition of *online resources* and other terms.

Overview: Students' formal information literacy education and informal help seeking

Of the 25 international students, all except two QUT students (Liz and Sun) gained some kind of support in using online information resources, as Appendix P shows. However, despite the extensive information literacy learning needs identified previously in this chapter, only one third of students participated in formal information literacy education. In contrast, over three quarters of the students gained informal help from library or lecturing staff, or friends. Table 7.1 below details the students' engagement with particular kinds of formal information literacy (IL) education and informal help.

Table 7.1 International students' formal information literacy learning and informal help-seeking

	CQU-BIC STUDENTS		QUT STUDENTS		TOTAL
	Undergrad (n=6)	**Postgrad (n=6)**	**Undergrad (n=5)**	**Postgrad (n=8)**	**All students (n=25)**
FORMAL IL EDUCATION					
Introductory/ generic IL class (Library)		1 (17%)		4 (50%)	**5 (20%)**
Course-related IL class	2 (33%)			1 (12.5%)	**3 (12%)**
Library orientation			1 (20%)	1 (12.5%)	**2 (8%)**
Research workshop (Learning Support)				1 (12.5%)	**1 (4%)**
INFORMAL HELP					
Librarian	4 (67%)	6 (100%)	3 (60%)	4 (50%)	**17 (68%)**
Friend	4 (67%)	3 (50%)	2 (40%)	2 (25%)	**11 (44%)**
Lecturer/tutor		3 (50%)	4 (80%)	2 (25%)	**9 (36%)**
Individual tuition (Learning Support)	1 (17%)				**1 (4%)**
Ask a Librarian (online chat service)			1 (20%)		**1 (4%)**
INDEPENDENT IL LEARNING					
Independent learning	1 (17%)	1 (17%)	1 (20%)	1 (12.5%)	**4 (16%)**
Library guide				1 (12.5%)	**1 (4%)**
Online IL tutorial					**0**

The majority of students gained more than one kind of support. (For example, Amy attended a generic information literacy class, and also gained help from a lecturer,

and from a librarian; Pete gained informal help from both a librarian and a friend). A few students gained only one kind of support, as follows:

- 2 undergraduates (Ann, Mak) and 1 postgraduate (Pat) who only gained help from library staff
- 1 postgraduate (Ela) who only gained help from a lecturer
- 1 undergraduate (Rod) and 1 postgraduate (Sam) who only gained help from a friend

Overall, a higher proportion of post graduate students than undergraduate students participated in formal information literacy education: just under one half of postgraduates, compared with just over one quarter of undergraduates. The reverse applied for informal help, since a greater proportion of undergraduates than postgraduates gained informal help. However, the difference between the two groups was relatively small, with 91% of undergraduates gaining informal help compared with 86% postgraduates.

The following three sub-sections outline the students' participation in formal information literacy education, their informal help-seeking and their independent information literacy learning.

Formal information literacy education

Overall, the students' experience of formal information literacy (IL) education was limited, in terms of participation and learning scope. Only 9 of the 25 students participated in any kind of formal IL education, which in most cases was of a basic and generic nature. As the previous table 7.1 shows, 2 students (both at QUT) attended a library orientation session and 5 students each attended one introductory class run by their university library. Only 3 students reported information literacy being a formal part of their course.

According to the students, the orientations and introductory classes provided a general overview of library services. For example, Ali said:

> *I did attend the library's lectury thingy where they show you … **where to go**, this is how to use your **password**, this is where you went if you want to find books and if you want to find journals.*

Similarly, Mat attended a library orientation session which he found useful, but overly brief and rushed. He mentioned that it barely touched on using information resources:

> *It was about how to use the library. They gave us … hand-outs and – **it was more about … how to place a hold – where books are located – about the penalties** – there was **one slide if I remember right on the usage of the online resources** and the lady who was conduct[ing] the session did spend a few minutes but it was not a lot, and again it was at the fag end and **we did have time pressure**.*

Alf mentioned that he had attended three classes (over two semesters) which had helped him to use journal databases, although he was still unsure how to use the library catalogue:

> *It's all about the how to … find out information like the database; and also the library **catalogue**, **but I still haven't heard about how to use this** … They have mentioned about ProQuest and others … a lot of times, and also how to like type in information appropriate and find out information.*

Alf's comment suggested that these three sessions were quite repetitive, without supporting progression towards more advanced understandings and information using practices.

While three students reported information literacy classes as a formal part of their course, only Han and Tom (at QUT) appeared to have experienced a collaborative teaching approach involving library and academic staff. Unusually among this group, Tom experienced more in-depth information literacy learning through a course-based research methodology unit. He also voluntarily attended a research workshop seminar run by Teaching and Learning Support Services at QUT, which integrated online resource-use and academic writing.

The students' limited participation in formal information literacy education appeared to be associated with limited opportunity, rather than intentional avoidance. Several students, including Sam and Mat, expressed a wish for more in-depth and subject-specific classes about using online resources. Nik indicated that he would be prepared to spend considerable time learning to use online resources:

> *If I know I can get very good understanding … and making very effective searches …*

I wouldn't mind spending … six, ten hours.

Informal help

As the previous table 7.1 shows, 22 of the 25 students gained some type of informal help. These included 8 of the 9 students who participated in formal information literacy education. The majority (17) of the students who gained informal help consulted library staff. On the other hand, 11 students gained help from friends, and 9 students gained help from lecturers or tutors. One CQU-BIC student gained individual assistance from Learning Support staff.

Library staff were the most common source of informal help for both undergraduate and postgraduate students. Thus, 73% of all undergraduates and 64% of all postgraduates gained library staff help. However, the proportions of students gaining help from lecturers and from friends varied between the two groups. Undergraduates ranked friends second, and ranked lecturer or tutor third. However, the pattern was reversed for postgraduates, more of whom sought help from lecturers than from friends. While a similar proportion (36%) of both undergraduates and postgraduates sought help from lecturers, a considerably greater proportion (64%) of undergraduates than postgraduates sought help from friends

Comparing the students across the two universities, all the CQU-BIC students and three quarters of the QUT students gained informal help. Both groups most commonly gained help from library staff. However, a greater proportion of all CQU-BIC students sought help from friends rather than from a lecturer or tutor, while a greater proportion of all QUT students sought help from lecturers rather than from friends. There was a discrepancy between the proportion of CQU-BIC and QUT undergraduates who sought help from a lecturer or tutor: no CQU-BIC undergraduates, compared with 80% of QUT undergraduates.

Students indicated that they sought help from library staff for various reasons, including their availability, approachability and willingness to teach students how to use online resources. For example, Liz commented that:

> *they [librarians] are very **helpful** people and … if she didn't **teach** me probably I would have a hard time figuring out how to use it [EIU] myself*.

Similarly, Jan sought help from library staff because they were encouraging and willing to spend time helping her with various matters, including referencing:

> *They helped you to type it in and say* ***'okay, nearly got results'****, things like that … And they even helped me … to do my Harvard system, for quoting for books.*

On the other hand, some students were less inclined to approach the library staff. For example, Han described how, as a new student, she went to the library for help, but the staff member was already dealing with two other students so she left.
A few students were simply unaware of help available at the library. Ann said:

> [Before this interview] ***I don't know I can come*** [to the library] *… and say I have this assignment and I don't know how to look for materials. But now I know*.

On the whole, the students found lecturers and tutors less helpful with learning to use online resources. The assistance they offered the students generally consisted of information about particular databases and links to Internet sites, but little guidance for using online resources in the context of the course or assignment. Some students reported instances where their lecturer seemed unable or unwilling to provide the needed support. For example, Jan reported that her lecturer gave her a hand-out to read without further explanation. The hand-out proved to be quite confusing since Jan did not understand the *peach* metaphor that it contained:

> *I get … a set of notes from my lecturer … a set of notes for the library, how you can find … I think it is* ***six slices in peach*** *…* ***she give it to us and I had to read through it***.

In two cases the lecturer merely referred the student to the library.

Almost half the students sought help from friends about finding information or using a particular resource. Sometimes, in addition to practical support, the students gained encouragement or critical feedback from friends. For example, Len described how he checked his understanding of an assignment with a friend:

> Len: *Man, let me tell you if I understand this. The assignment is da-da-da-da.*
> Friend: *Yes, is all right.*
> Len: *Ah, OK!* ***I just confirm that I understood****.*

Han found it beneficial to work with an Australian friend, who she thought was more familiar with online resources:

> *I had a presentation with an Australian friend so I saw her doing this. I asked her … she just showed me some example, like how can find this one. She told me you have to go to the CINAHL, you have to go to the Medline. And she gave me a guide, some idea of it …* ***She's a Australian, so she know about all this stuff****.*

Only two students mentioned seeking help online. Jan had used QUT Library's online *Ask a Librarian* service helpful. Alf mentioned that he sometimes used online chat to contact friends for help:

> *I use MSN and all my friends are there and so I … just ask them … do you know how to find out this kind of information. If they know they just tell me ... 'you can go to somewhere' or, 'I got website.*

Independent information literacy learning

A few students indicated that they independently learned to use online resources, "by doing" (Pete), or "by experience" (Rod). Ali explained how she continued to build on initial learning gained from an introductory session:

> *The library gave … a really basic kind of introduction … based on that I played around … as the years go past and as the semester builds up … I was able to explore more and go out more in terms of clicking links and stuff like that.*

Only one student (Tom) mentioned having used a library-produced guide to learn independently about using online information resources. Van said he had tried one, but did not persist with it:

> *I looked at one of the help guides … how to use the databases but I …* ***gave up half way*** *…* ***it was too time consuming****.*

Notably, none of the students used the online tutorials provided by their university library: *Compass: Library help online* (CQU Library, n.d.) and *Pilot: Your information naviagtor* (QUT Library, 2005).

Critical findings: Learning to use online resources

The following Table 7.2 presents *critical findings* about how the students learned, and gained help, to use online information resources.

Table 7.2 Critical findings: Information-learning

	CRITICAL FINDINGS: INFORMATION-LEARNING
USING ONLINE RESOURCES	**Formal information literacy education:** ➢ Limited participation ➢ Limited opportunities ➢ Generally basic and generic **Students' sources of informal help:** ➢ Librarians, friends, lecturers **Students' limited independent learning**
CRITICAL FEATURES	**Imbalance** ➢ Considerable IL learning needs ~ Limited formal IL education ➢ More informal help-seeking ~ Less participation in formal IL education
	Unfamiliarity ➢ Help available ➢ Online tutorials ➢ Library guides
	Shared experience ➢ Undergraduates - postgraduates ➢ CQU-BIC students - QUT students - similar information literacy learning needs
IL NEEDS	**Information literacy learning needs** ➢ To provide more extensive, ongoing, course-specific IL learning opportunities ➢ To raise students' awareness of: - Library support services, Online tutorials, Online help ➢ To support lecturers' IL learning

The *critical findings* shown in the above table reflect the themes of *imbalance, shared experiences* and *unfamiliarity,* which were also noted previously in connection with the students' *interactions* with online resources (Tables 6.11, 6.14 and 6.16). *Imbalance* is apparent between the students' considerable information literacy needs and limited formal information literacy learning; and also, between their generally limited participation in formal information literacy education, yet considerable use of informal help from library staff, lecturers and friends. *Shared experience* was evident between undergraduates and postgraduates, and between students at CQU-BIC and QUT. Overall, the patterns of information literacy learning and help-seeking were quite similar between undergraduates and postgraduates. A minority of both groups participated in formal information literacy education, while a

great majority of both groups gained informal help. There was also some evidence of students' *unfamiliarity* with online tutorials, and library guides. The students' relatively high use of help from friends seemed to be partly associated with their unfamiliarity with other formal and informal sources. Help from friends would offer potential benefits of social support and collaborative learning. However, since the nature and accuracy of help from friends would vary according to circumstances, students would generally benefit from combining it with other learning and sources of help.

The findings outlined above identify three main **information literacy learning needs**. First, there is a need to provide more extensive, curriculum-based information literacy learning opportunities, which are at a level appropriate to the students' academic needs; and which enable the students to develop familiarity with discipline-specific online resources, and to use them actively and critically. Second, there is a need for enhanced promotion to raise students' awareness of information literacy learning resources, such as online tutorials and learning guides. Third, there is a need to support the information literacy learning of teaching staff, to enhance the quality of assistance they offer students with their learning-related use of online resources. The *implications* of these findings are discussed in Chapter 8.

Affective Dimensions

During their interviews, the international students reported a varied range of affective responses to online resources[20]. Their answers revealed nuances between their *thoughts* about *online information resources* themselves and their *feelings* about the activity of using them. For example:

- Bev *thought online resources were useful* resources
- Mat *felt excited* that online resources are available

Overall, the students' thoughts about online resources tended to be more positive than their feelings about using them. Perhaps, while the students recognised benefits of online resources to support their study, they did not necessarily enjoy using them.

[20] In reporting the students' affective and reflective responses I quote their own words, without attempting to interpret personal or implied meanings

The following Table 7.3 summarises the students' affective responses to using online resources. In a manner typical of critical incident technique (Flanagan, 1954) I group the students' thoughts and feelings in two contrasting categories: *more positive* and *less positive*. However, the use of the qualifiers 'more' and 'less' recognise nuances in human experiences that are not adequately represented by the binary categorisation of critical incident technique.

Table 7.3 Varied range of students' thoughts and feelings about online resources

more positive ⟷ less positive	
Students' thoughts **about online information resources …**	
Online resources: ➢ are quick/time-saving/convenient ➢ are useful ➢ provide a lot of information ➢ they help learning/build knowledge ➢ meet information needs ➢ are easy to use/learn to use ➢ are helpful ➢ are interesting ➢ are beneficial ➢ are fun ➢ are pleasurable, enjoyable	**Online resources:** ➢ are time-consuming ➢ cost a lot to use/access articles ➢ provide unsatisfactory/unreliable results ➢ are hard to use/learn to use ➢ have boring interfaces ➢ are frustrating ➢ are tiring ➢ annoying
Students' feelings **about online information resources …**	
Students feel: ➢ happy, glad ➢ satisfied ➢ excited	**Students feel:** ➢ frustrated ➢ tired ➢ annoyed ➢ angry ➢ confused ➢ afraid ➢ hate ➢ panic ➢ nervous ➢ unsettled ➢ losing patience ➢ disappointed ➢ sick ➢ crazy

Mixed responses

As the above table shows, the students expressed a varied range of thoughts and feelings about online resources. Notably, the students[21] described a wider range of affective responses than the anxiety and uncertainty about library and information use that is frequently reported (Battle, 2004; Kuhlthau, 2004; Jiao & Onwuegbuzie, 2001; Mehra & Bilal, 2007). Their *more positive feelings* included *happy, satisfied* and *excited*, while *less positive feelings* included *frustrated, tired, angry, nervous, disappointed* and *sick*. Their responses are complex, since individual students sometimes reported a mix of *more positive* and *less positive* responses. For example, Lyn acknowledged some benefits in using online resources, whilst indicating that they made her feel both happy and crazy:

> *[I think online resources are]* ***Convenient*** *…* ***useful*** *…* ***quickly, faster*** *… [I feel]* ***happy*** *to find it quickly … [but it] make me* ***crazy****, too much information*

Similarly Alf concluded:

> *It's* ***convenient*** *but it's* ***time consuming*** [thoughts] … ***I enjoy it*** [feelings]. *If I can't find out information sometimes* ***a little bit angry*** *but most of the time I happy* [feelings].

Some students noted positive aspects of online resources, whilst acknowledging limitations in their information literacy. For Kim the Internet was 'convenient and 'unlimited'. However, she stated:

> *Internet info is powerful …* ***if you know exactly how to search***.

Mat said:

> ***I know there is a lot there****, so I think that at this point in time I'm speaking more from the* **frustration** *of being* ***unable to access it***.

The nature of the students' responses varied according to circumstances, and the successfulness of their interactions. For example, Sam commented:

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[21] In reporting the students' affective responses I quote their own words, without attempting to interpret personal or implied meanings

*There are extremes. It's not exciting, not boring. Sometimes **frustrating** – once I had 3 days searching and found nothing. That can also be **annoying**. Other times you spend 10 minutes and get information. Then you're **happy**. It depends – it's hard to generalise*.

It was clear from Liz's statement below that students' responses may change over time, with developing experience:

[It is] ***confusing*** *when you first use but after that it's okay, it's very* ***helpful***.

Notably there were some conflicting opinions. For example, students described online resources variously as being time-saving as well as time-consuming, that they provided variety and quality, as well as unsatisfactory, unreliable results.

More positive responses

Students variously said they felt happy, glad, satisfied and even excited about online resources. Their *more positive* responses related to:

- the convenience and practicality of online resources
- the accessibility of online information to meet the students' study needs
- good features of online resources
- the fun of using online resources
- beneficial outcomes of using online resources

The students were generally pleased to have access to online resources. For example, Mat commented:

I'm really ***excited*** *about the fact that these things are available*

Several students considered online resources to be convenient, stating among other things that they saved time and made it easy to access information. For example, Alf said:

It is ***convenient*** *because you can just sit there and type and then is come a lot of results … You don't need to go to read the newspaper … it's* ***time save****, because easy to find out information.*

Amy also appreciated the accessibility of information via online resources:

> *You have very good access to information – so you just go to … library website and click on resources …* ***quick access to information for uni****.*

Jan compared online resources favourably with the physical library and books:

> *It's* ***easy. I don't need to like carry books****.*

The students tended to single out the Internet when discussing the convenience of using online resources. Jan explained that she could not live without the Internet because it provided access to plentiful, constantly accessible information:

> *It really made my life* ***easier*** *… when you are entering Internet it is just like* ***… a world of information*** *and … even though the assignment, I have to pass it tomorrow, I have done nothing yet, I'm not worried about it. Tonight I'll just go home and on my computer and just click on everything, I search,* ***I'll get everything done*** *… it's easy, there's lots of information. Just put on the website and Google …* ***any time,*** *you can go like, you can sleep until 2 or 3 o'clock, just wake up and get on it.*

Similarly, Nik described the Internet as "useful" and "great" because:

> *It can* ***save a lot of time****. And you have* ***access to documents*** *which you wouldn't usually.*

Among positive features of online resources, students mentioned the layout and searchability of the *Google* search engine. Van described *Google* as *groundbreaking* and praised its *simple interface*. Similarly Len commented:

> *I like Google - a* ***very simple*** *website … just simple* ***elegance.***

Meanwhile, Rod thought the Internet was good because *quite a lot is free*.

A few students stated that they enjoyed the process of using online resources. For example, Pete found using them a *pleasurable challenge*, while Cal claimed that it was:

> ***Quite fun*** *… to search … no need to run here and there to search for the books.*

Students' more positive responses to online resources were often associated with the beneficial outcomes they achieved, such as gaining needed information for assignments or widening their knowledge. For example Nik stated that online resources generally met his information needs:

> *Once you find the right database, I think then … it's* ***very useful*** *because it … usually includes information what you're usually looking for.*

Cal stated that online resources were useful because they "topped our knowledge up" of different parts of the world. Len described the following positive feeling:

> *At the end you learn something new and you* ***feel satisfied*** *that you can get more information.*

Some students seemed to have developed a strong attachment to online resources, with Han rating them as the "second best friend of the student", after her parents and the university:

> *because it helps us in the study, it helps us to improve our grades, it give us information on any topic, on the latest one and … it gives us an idea …* ***it just help us like a friend****, if you need something you can take my hand.*

Sam also considered the Internet as a friend:

> *It's been* ***a good friend*** *of mine for doing assignments*.

Less positive responses

Students also expressed a wide range of less positive feelings about online resources, most commonly frustration and annoyance. While no students specifically used the terms *anxiety* or *uncertainty*, as reported by other researchers (Kuhlthau, 2004; Jiao, & Onwuegbuzie, 2001) a few expressed similar feelings. For example, Pat said she felt nervous about finding results, and Cal felt "unsettled" on first encountering online resources.

The students' less positive responses related to:

- challenges in using online resources

- poor features of online resources
- physical discomfort in using online resources

Students' less positive responses were often associated with **challenges** noted in the previous chapter, especially unfamiliarity with online resources. Mat strikingly said:

> *I have always started with a **feeling of panic** … because it's really a voyage into the unknown.*

Mat described feelings of fear, and later frustration, associated with not knowing how to use online resources. He explained the impact in terms of the length of time taken and limited results gained in carrying out a search:

> *There are a few databases, and we were not sure which to use when, and … if you picked one it would go on a search and that would take **plenty of time**, so that's where we lost out a fair bit on, and it didn't really achieve much **… It was frustrating** …*

Ann also found using journal databases annoying due to difficulties experienced:

> *I try to use journals online … but it was kind of hard to find anything … It was very **annoying**.*

For similar reasons, others reported feeling impatience, disappointment or anger. Lia said she lost patience because she was unable to differentiate between numerous databases:

> *When you search for one subject there might come out ten, or more than ten databases, and I don't know what the difference between each other, and when you read heaps of paragraph of ten, you just **lose patience**.*

Some students experienced physical discomfort in using online resources. Kim found reading from a computer screen hard on her eyes. As Sam said:

> *When you search … there's a list of a hundred items … and you're searching through each and every item, sitting there for hours. It gets **tiring** sometimes.*

Bev, who found reading the small print of online journal articles tiring, commented:

*Too much computer makes **you feel sick**.*

Students indicated various poor features of online resources. For example, Ann was *annoyed* by the complexity of the library catalogue, while Len mentioned the bland colours and layout of his library website. Lia was critical of database interfaces:

*It's **so boring**, because black and white is just boring, not only boring but it's hard for a student to identify with each other.*

Lia also noted that information on her library website was unsatisfactory, as a result:

We spend so long time on reading the description of the database.

Despite the wide range of online resources that are freely available via the library websites and the World Wide Web, several students including Rod mentioned concerns about the perceived costs of using online resources. For example, Sam says:

*Sometimes you're looking for a particular topic … and to find information on that, probably you find it but **you need to pay** for it. **It's sad**.*

Rod described even stronger feelings:

*To sum up – **I hate it** … cause it come up **too many rubbish** and ask me too many time … for the name and password … because they **looking for money**.*

In some cases, students' less positive responses compromised their resource-using outcomes. For example, when Van experienced difficulty in using journal databases he tried using a help guide, but *gave up half way* because *it was too time consuming*. Whilst realising that *Google* (2008) was not an academic database he turned to it because it gave him "more straightforward answers". Ann was so annoyed with trying to use a journal database that she "just left it a little bit", while Rod determined instead to:

buy the book. I think that's the good way.

Critical findings: Affective responses

Summarising this section, the following Table 7.4 presents *critical findings* about the students' affective responses – their thoughts and feelings about online resources.

Table 7.4 Critical findings: The students' affective responses to online resources

	CRITICAL FINDINGS: AFFECTIVE RESPONSES
USING ONLINE RESOURCES	**Students expressed a range of thoughts and feelings about using online resources** ➢ More positive responses: students are happy, satisfied because: - online resources are convenient, useful - using online resources widens knowledge - outcomes of using online resources are new information, new knowledge ➢ Less positive responses: students are frustrated, annoyed because: - online resources are unfamiliar, time consuming, poorly designed, expensive to use, - using online resources causes physical discomfort - outcomes of using online resources are too many results, unreliable results
CRITICAL FEATURES	**Unfamiliarity** - Associated with less positive thoughts and feelings
	Overflow - Associated with less positive thoughts and feelings
	Imbalance more positive thoughts ~ less positive feelings
IL LEARNING NEEDS	**Information literacy learning needs** Enable students to: ➢ Build on aspects associated with more positive responses ➢ Address challenges associated with less positive responses Information literacy education that: ➢ Is responsive to students' thoughts and feelings ➢ Aims to redress the imbalance of more positive thoughts ~ less positive feelings

The students reported a wide range of affective responses to online resources. Overall, they expressed more positive thoughts about using resources, and less positive feelings about the resources themselves, suggesting students' more pragmatic acceptance of the usefulness of online resources for assignments, rather than pleasure in using them.

The findings suggest an apparent link between students' affective responses and the ways that they approached using online resources. For example, a few students gave up in frustration when experiencing challenges in using online resources. This

suggests the need to take account of students' affective responses when planning and implementing information literacy education. In particular, it would seem important to foster positive attitudes towards using online resources. As individuals develop familiarity and confidence in using resources, they are more likely to gain enjoyment and satisfaction from them – and vice versa.

Reflective Dimensions

While the previous section considered international students' affective responses, or thoughts and feelings about online resources, this section features their reflective responses to the whole experience of using online information resources. Looking backwards, the students revealed positive and negative aspects of both using resources, and learning to use them. Looking forwards, they offered recommendations for enhancing international students' resource-using experiences.

Students looking backwards: Using resources

Despite the considerable challenges reported in Chapter 6, the students generally reported their overall experience to be positive, expressing it variously as "amazing", "great", "excellent" and "helpful". Lia commented:

> *Because I **always can find something I wish to find**, and you can give me what I want, so I call that positive.*

However, Lia added that having access to large amounts of information can be both beneficial and problematic:

> *I think it's **convenient**, but also **trouble** – rather a **paradox** - to pick up the most useful information from heaps of information*.

More positive experiences

Students offered a variety of reasons for describing their experience as positive. The main reasons were that using online resources:

- met their assignment information needs
- enabled their learning

- was personally empowering

Several students mentioned that using online resources had been a positive experience since they gained information needed for assignments. According to Alf:

> *For this assignment I think that the database is real help me, is a kind of positive experience. I can* ***find out*** *most of* ***the information I need*** *to* ***help me to finish this assignment****.*

Sometimes students considered their resource-using experiences to be positive because they provided access to previously unknown sources. Thus, Lyn said:

> *Before I did my studies, I had to limit my search way, but once I know database … I can get* ***more information*** *and that's good and it's not very hard to learn.*

Similarly, Jan reported that online resources increased her knowledge-base by leading her to new and unexpected information:

> *It's actually a positive experience. Sometimes when you search for information you might read some information … not regarding some of your topics, but you …* ***say oh, I didn't realise that*** *…I might search for like statistic on consumer behaviour, how consumer act, and [I] might read some other statistics ... and [I] think about it and say, yeah, sometimes customer really act this way. This way …* ***you'll find … new things, as well as information.***

Lia envisaged using information resources as a means to an end, like a bus taking her *"a long way to get information".* She stated that although using online resources was "*not exciting"*, it was a positive experience, since online resources enabled her to reach her assignment outcomes. Tom claimed that:

> *Online resources and studying is inseparatable.*

Other students equated using online resources with learning in a wider sense. Thus, Cal described the *technology* [online resources] as "an asset of education … a catalyst for you to learn" and Bev considered that they offered her a "different kind of learning". Similarly, Ela associated using online resources with increasing her knowledge:

Because [of] the experience … I know more – I like using them [online resources]

In addition Pete regarded using resources as a positive learning challenge in itself:

*Searching for and finding information can be **pleasurable** if it goes well - you can turn the problem into **a challenge**.*

Importantly, given the culturally diverse learning environment, Liz considered online resources enabled her to develop cultural understanding:

*I learnt to use the new database and then through the searching of information on the internet I actually **know more about the culture** of the countries.*

Van expressed a similar opinion, adding that online resources contributed to successful group work and gave him the opportunity to develop local knowledge:

*It was definitely a positive experience. I got **a lot of information** that I could use for my assignment … it's been good for the project … (being mix of local and international students) we could like help each other out, so we've been having a really good experience I think. Like having the **Australian point of view.***

Han also considered that using online resources improved her English vocabulary.

For some students, using online resources was **personally empowering**. Sun said:

*It's all about knowledge, information. **If you have knowledge, you have power**.*

Han described the personal benefits she had gained through using online resources, in terms of confidence in using technology and patience:

*The first **big difference** is now I am **happy that I'm using the technology** … and the second is that **it makes me more** … **patient** … because I am not used to reading a lot, but the assignment stuff and this Internet, this technology, makes me more patient … I am ready to spend my time.*

Moreover, Len stated that learning to use databases for a recent assignment raised his awareness of new information sources, with lasting educational and professional benefits:

This assignment … introduce me to these databases, because before honestly I never use … and now I know, for example, ***if I have some work, some assignment*** *to do, or … I need to search for some information [for]* ***some business I want to do*** *…* ***Now I got the knowledge*** *that these things exist and how to search and things like that …* ***So is opening my mind****.*

Less positive experiences

On a less positive note, Pete found using resources to be impersonal and he expressed reservations about the way they took away *the correspondence between people*. Tom indicated that his initial experience had been quite negative, since he lacked preparation for using online resources:

I think at that time ***I felt a little bit disappointed*** *… I think* ***[the university] is not very well prepared for international student*** *with such a background like me, because, may be in their assumption that every student know how to access Internet, know how to access online - but we didn't, we didn't. We came from … a very poor country and very disadvantaged.* ***We didn't have such information and we are not prepared for something like that****.*

As a result of his initial experiences, Tom was so discouraged that he felt inclined to return to his home country:

On the first two weeks I just wanted to go back to Vietnam, ***I didn't want to study at [this university] because it is so discouraging.***

However, over the course of one year Tom gradually developed confidence in using online resources, to the extent that:

I feel a little bit worried when I come back to Vietnam … ***I cannot imagine how can I do research without such good information and database*** *- so online resources offer me a very good chance to do research - and also it offer me a lot of difficulties to do research without it.*

Only Ann described her overall experience of using online resources to be completely negative, since a combination of unfamiliarity with resources, limited time and help led to unsatisfactory results:

__It was negative__ … but that was just because of the __lack of time__, __lack of help__ in understanding the assignment and getting guidelines for the assignment … In the minute that you see that it's hard you don't now anything, so __you start to stress out__ and it takes days until you actually sit and try to do it … The books didn't really help me … and I don't know how I did it basically. Honestly I don't … __The percentage (of resources found) that … actually help me was so small … compared to the time I invested in it__ … It's too rude to say it … About using online tools - When I have time to do it, it is useful. But when I'm very stressed with time and many assignments on my head it's more a__nnoying__ … Then you have to look for it more and it's very annoying…Then for me it will be __better to just go to the book__ and it's just there and just copy it and get new ideas.

Students looking backwards: Learning to use online resources

In reflecting on their experiences of learning to use resources, the students from both universities tended to comment more favourably about informal help from library staff, and less favourably about formal information literacy offerings. Overall, more positive aspects of their information-learning experiences included:

- the helpfulness and approachability of library staff (informal help)
- course-related information literacy activities (formal information literacy learning)
- their independent learning

Less positive information-learning aspects included:

- short, rushed nature of introductory sessions (formal learning)
- the generic content of introductory sessions (formal learning)
- inconvenient timetabling of introductory sessions (formal learning)

Informal help

The following comment from Mat exemplifies students' generally positive reports about the informal help they received from library staff:

I think across the board the experience has been that when we have a problem and we approach __someone in the library, the response is exemplary__ … It's unbelievable. And I've been in customer service myself and I'm just amazed at the temperament, I mean … at half past four in the __evening the person is still smiling and still polite and still very patient__ – and that is very very good … I've had people who've come with me from the third level … to level 5 or 6 just to __help me locate a book__ … and there are 5 minutes available … and they say no, no, we like to help.

Other students also found personal consultation with a librarian helpful for gaining information and also learning about new resources and strategies. For example, Kim told how a librarian enabled her to understand the arrangement of resources in the library, explaining it to be “like a snake” running around the shelves. Jan reported that the librarian was helpful and – importantly - encouraging:

> *They [librarian]* ***helped you*** *to type it in and* ***say okay, nearly got results*** *…. where can I get it … They even helped me … how to do my Harvard system, for quoting for books.*

In contrast, the students’ experiences of seeking help from teaching staff were less positive. Tellingly, Amy commented that lecturers:

> *Usually send us to library … to library staff … to ask… because* ***they are not comfortable*** *with this stuff and they will not … help us … tell us exactly what to do.*

Formal information literacy learning

The few students who participated in course-related information literacy learning reported it positively. For example, Tom described the benefit of combining academic and information skills through a research methods unit and a voluntary workshop:

> *It show me how to look for the database … the journal online … the book … the library skills and also how to write an essay … which was really helpful … With the [workshop] … and the information from [the unit], I can learn how to search for the material and the literature.*

More often, however, students commented less positively about generic and introductory information literacy activities, in terms of content and presentation. In most cases the students who attended library orientation or introductory information skills sessions found them too short, hurried, or with insufficient coverage to meet their initial course needs. For example, Mat said the information literacy session he attended was inadequate because:

> *It was too too short and it’s not the kind of thing you can grasp in a half hour lecture*

Although Lia attended a seemingly more advanced seminar on using databases organised by the library, she still found it too short and general for her needs:

*But in that seminar since the **time is quite limited**, we don't really go through every database … because **it is quite general** for every student which are from different faculties.*

Inconvenient timetabling

Several students mentioned inconvenient timetabling as a less positive aspect of formal information literacy learning. The scheduling of library orientations and introductory sessions prior to, or during, the first week of semester sometimes disadvantaged international students, whose arrival in Australia was delayed for administrative reasons (such as receiving their study visa). For example, Mat stated:

Unfortunately I did miss the orientation – I was a week late coming in … it means compounding the confusion.

Mat regretted having missed orientation because he believed it to be:

A very significant stepping stone, so that before you start the study you know what… you're supposed to do and then I think it makes it a lot easier. It's like for instance when we get the … the local road maps – it's useful to understand how to read a map first before you get into a car and start off on a journey.

Mat also described difficulty in participating in library and learning support activities, since the six week teaching periods of his MBA course do not align with university semesters.

Independent learning

On the other hand, several students reported instances of independent learning as being a positive aspect of their resource-using experiences. Sam for example said:

In the first 5 or 6 months … I find it pretty difficult … but as you get used to searching stuff online you get probably good at that stuff. Now, it's probably much easier than it was one year ago for me to search for particular information.

Ali expressed satisfaction about learning independently to use online resources by building on the introduction she gained through the library. Similarly, Mat had come

to see his perseverance through a frustrating database experience in a positive light, since he had learned that online use required time and planning, and that he could call on library staff for assistance:

> *The next time … I know that I would need to **start a lot earlier** and rather than trust myself, **go to someone** who knows more.*

Students looking forwards: Recommendations

In addition to reflecting back on their previous resource-using experiences, the students looked forwards to offer a variety of suggestions for improving information literacy education and the design of online resources. In particular, students mentioned a need for more extensive and more conveniently scheduled information learning opportunities. Several students considered that library staff should be responsible for formal information literacy education, with Nik explaining:

> *cause you guys are the experts in making research.*

The students' main recommendations included the need for:

- more extensive, integrated information literacy learning
- varied learning and teaching modes
- more flexible timetabling
- needs-based responses
- 24-hour online help
- improved resource design

More extensive, integrated information literacy learning

Several students recommended more extensive formal information literacy learning opportunities than they had previously experienced. Their suggestions pointed towards an integrated approach would include:

- general orientation to the library
- in-depth introductory sessions on basic skills, and information resources relevant to their discipline
- using resources to address course-specific information needs
- academic practices such as referencing

Lia stated the need for both generic and discipline–specific learning opportunities:

The seminar … [how to] participate in the library, the general introduction … that one is useful … it's a good start, but I do suggest every faculty to run their own seminar to teach student how to use the databases in their own faculty.

Van suggested that it was important to not only teach how to use online resources, but to demonstrate their usefulness with applied examples:

Go through and show a little bit with examples … [of] how powerful the databases can be.

To overcome the disadvantages of general orientations, Mat suggested a small group approach, and a series of sessions that progressed from generic to more course-focused concerns:

You get ten people into a room given computers and ask them to find out certain things, you know ***it could be very generic to begin with****, because the main thing is to figure out which things to navigate from and to an what to do when …* **[Then]** ***detailed training****.*

Mat also considered that information literacy learning should be practical, whilst enabling students to develop understandings necessary to transfer skills to different contexts:

I think ***practice is very important*** *… the topic different between one and the other. If you show this one you might not know the other one,* ***so it's not more about skills … If they only teach student very general things, the process - not specific – it's a problem.***

A few students suggested that information literacy learning should include academic practices. For example, Ann proposed the inclusion of assignment writing and referencing, while Sam explained:

Students need more information about referencing. I've never done it in India. The library gives a piece of paper about referencing but we need to be shown how to do it. Even in business life you have to write a particular, consistent style.

Liz suggested that educators should consider international students' diverse backgrounds when designing learning and assessment activities involving the use of online resources:

Maybe … they can give an international example and not focus on Australian examples. I understand that there are more Australians than international students … but … there is a growing number of international students and I think there needs to be some ***balance****.*

Varied learning and teaching modes

Students recommended the incorporation of varied learning and teaching modes. While some students favoured learning to use online resources through hands-on practice, others like Mat requested demonstrations. Sam considered that students needed the motivation of continuing face-to-face learning:

Online tutorials are helpful, good to a certain extent for introduction to resources, but students are lazy. Students need face to face instruction beyond the basic information.

Han suggested the provision of introductory information online, via OLT[22], to show:

This is your information of the library … one or two pages of the OLT site. ***It would be really helpful to us*** *… [to]* ***have the same thing on the OLT site …*** *[for the]* ***whole of one semester*** *… If we need it, we can go to it, we can read it, we can look it.*

Despite - or perhaps because of – the focus on online resources, no students recommended online tutorials. Significantly, Tom pointed out that online tutorials may be unhelpful for students who are already experiencing online challenges:

[If] the student have problems with the online skills, *if we offer them courses on line* ***there is no way they can access the online courses****. So face to face courses more helpful.*

Considering international students' diverse linguistic backgrounds, Han recommended that online materials should be written in simple language, supported by informative graphics:

It should be ***with the pictures*** *… this is your … search engine, like Academic [sic] … because* ***it's easier for us*** *to … go to the pictures than the readings.*

[22] OLT (Online Learning and Teaching): QUT's online learning system at the time

Flexible timetabling

The students' suggestions indicated the need for more flexible scheduling of information literacy education, to allow for international students' varied circumstances. Sam indicated that participation should be voluntary, while others saw it as an essential element of their course.

Nik suggested that information literacy sessions should begin early in the semester, to enable students to prepare for their first assignments:

> *Right in the beginning … especially because the first couple of weeks is really slow … I know* ***a lot of students who first of all just struggle to get the material*** *before getting into the assignment itself.*

However, Han indicated a need to schedule sessions a little later, to allow for late-arriving students:

> *In the orientation week nobody would come …* ***It should be in second or third week when all … the students have reached here****.*

Nik also pointed out that information literacy education should be ongoing, to allow for students' developing information literacy awareness over their course:

> *When I talk to the mature [more advanced] students, I think they are all interest, because they know what they have to face.*

Several students suggested that they would be willing to spend considerable time in learning how to use online resources. Thus, Nik said:

> *I would like to request … program in library, like searching …* ***Maybe 2 hour session*** *… how to use the searches effectively.*

Similarly, Mat suggested:

> ***Maybe a half day, one day*** *… because there is really so much available.*

Other student suggestions included an in-depth week-end workshop, or a series of classes or lectures throughout the semester.

Needs-based learning

There was a general acceptance of online resources among the students, with Tom insisting that:

> *every international student needs to be prepared to work online.*

None of the students expressed a wish for international students to be treated specially or given separate instruction. According to Cal, international students should:

> *try to learn to change … have an open mind. If really you cannot handle it you can always ask someone else in the institution.*

However, given the diversity of international students and their educational experiences, Tom recommended ongoing information literacy learning needs analysis. He proposed a questionnaire to gain an indication of students' current information literacy, as an initial basis for developing information literacy education:

> *I think when a student enrol … maybe a … very* ***simple questionnaire*** *can help … like, 'can you use online resources?, or 'are you familiar with computers? … 'Do you need any help with that?' 'Are you familiar with searching online?'*

Tom also indicated the importance for lecturing staff to identify and offer support to international students who are experiencing challenges. He suggested that this intervention might lessen lecturers' tendencies towards generalised assumptions about students' existing knowledge or experiences:

> *Also, on the first day of … the tutorial or the workshop, if* ***the lecturer can identify the problem from the student****, because not all the student can answer the questionnaire like that … I think that some time, with* ***some of the lecturers, they take things for granted, in their assumption every student know that.*** *But really some international student didn't know that. We came from a different background and we really need help. So if the teacher can … identify the needs from international student, and maybe they denote that they are reluctant to talk … on the first day they are more friendly, they talk to some international student about online [resources].*

24-hour online help

Few students offered suggestions for improving informal help. However, Jan requested that QUT Library extend its *Ask a Librarian* service to twenty four hours, to make help available at times when students are off-campus:

> *We need them during … night time or when it's not office hour … I found it hard with limited time. They should make it twenty four hours … because office hour we are on campus so, you can just talk to them and ask them.*

Improving the design of online resources

Several students offered suggestions for improving the design of online resources, which centred on:

- creating user-friendly interfaces
- creating subject-specific content areas within the university library website

Several students recommended making database interfaces more user-friendly. For example, Lia said:

> *In the database,* ***try to make more colour*** *… because black and white is … not only* ***boring, but it's hard for a student to identify*** *[different databases].*

Len suggested that the layout of the library website needed to be simpler and easier to navigate, with clearer signposting and menus:

> *[There is]* ***too much information*** *… maybe you can be a bit more friendly… not too much icons… and I don't know for example where is … the dictionaries… so maybe they could have a* ***new more – easier – menu*** *…* ***more simple****.*

Ann suggested applying a *Google*-like design to the library website and catalogue:

> *If they had …* ***less options on the screen it would be easier*** *… Like some websites, like Google, it's very simple…one turn you're finished*

Nik offered various suggestions for improving the navigability of the library website, such as providing information to assist selection of appropriate databases that offer full-text articles:

Because of the layout … once you go to the databases, and then just trying to find one, you have to go from A to Z and it's very painful … So at least if there is a ***better table format*** *where you can actually straight jump into the necessary database … that would be good … Cause there are databases where you can have access to* ***the whole version, or … just to the abstract. So if I can at least sort it out in the beginning to the databases which only offer … either one*** *… then I can narrow down quite a bit at that stage … And if you only want looking for full text you're not interesting the ones only have abstract.*

Mat recommended the website of online retailer Amazon as a model for improving the usefulness and functionality of academic resources, thus assisting students to find out about and share resources relevant to their subject area:

Buying books from ***Amazon.com*** *… they tell you that people who bought this also did these other things, and* ***I have found it useful*** *to go down that path. So …* ***when we get to the database, maybe there could be a message that says someone else who also did this also did that*** *… that would make it a lot easier … And in the confines of the MBA program … let's say that I access a certain resource and someone is tracking that, and so it goes into a basket. Another student goes into another resource – that goes into a basket.*

Mat also suggested the creation of subject-specialist areas within the library web page:

Maybe creating a smaller – sort of web*, if you like – of resources* ***for students in my discipline****, because it would make it a lot easier. Like, for instance, when I learn about human resources – the minute I hit human resources, I'm getting into the world of psychology ... and the stuff that comes up needs to be filtered by me to really get to what I really want, and that's because it's like part of this huge mass of information that we have here, so that's were I think* ***if you can make it slightly clearer, more finite, it would be easier for us to go to.***

In addition, Mat recommended the provision of online guides to key writers, to support initial learning in a new field:

In an area which I'm studying for the first time there is a limitation because there is no way of making out what is good and what's not so good. ***What would help*** *is that … certain names … are mentioned of some of the* ***leading writers in the area*** *… If there is*

some sort of standard database in this area … that makes it easier … at first when I'm looking at a new area.

Similarly, Alf suggested that the library might create a website that refers students to *reliable* online sources of information about:

Australia, Australia's statistics or Australians or sometimes government websites

Critical findings: Reflective responses

The following Table 7.5 presents critical findings associated with the international students' reflective responses to the whole experience of using online resources to learn.

Table 7.5 Critical findings: Students' reflective responses to using online resources

	CRITICAL FINDINGS: REFLECTIVE RESPONSES
USING ONLINE RESOURCES	**Overall, the students considered the overall experience of using online resources to be a positive experience** ➢ More positive aspects of using resources: - Meeting assignment information needs - Developing new knowledge, learning - Personal empowerment - Informal help from library staff ➢ Less positive aspects of the experience: - Stressful, time-consuming - Unsatisfactory outcomes – too much/too little information - Limited preparation for using resources - Limited formal information literacy learning (rushed, basic, generic)
	Students' recommendations for enhancing their experience of using online resources ➢ More extensive information literacy learning - Introductory and course-specific - Ongoing, needs-based learning - Varied modes - Flexible scheduling ➢ Improved resource design - User-friendly interfaces - Subject-specific websites
CRITICAL FEATURES	➢ Limited opportunities - Formal information literacy learning opportunities
IL LEARNING NEEDS	**Information literacy learning needs** Integrated information literacy approach - continuous, developmental approach

The students generally viewed their overall experience of using online resources in a positive light, whilst indicating significant information literacy learning needs. They provided extensive recommendations for improving information literacy learning and online resource design, which are discussed further in Chapter 8.

Linguistic and Cultural Dimensions of Students' Online Resource Use

Up to now, the findings have offered glimpses of the cultural and linguistic dimensions of the international students' resource-using experiences. This section highlights these linguistic and cultural dimensions, indicating that they are:

- evident in the diversity of the students and their information-learning environment
- inter-related
- intrinsic to international students' experiences of using online resources to learn
- nuanced and varied
- *shared experiences* - among international and domestic students alike

It is important to note that linguistic and cultural dimensions are associated with resource-using strengths as well as challenges.

Impacts of linguistic and cultural dimensions

During the interviews I asked the international students:
In what ways do you think being an international student affected this experience [of using online resources? Why?
Some students considered that being an international student did not affect their use of online resources. They saw themselves simply as students, rather than as international students, chasing particular assignment-related information needs. Thus, in responding to the above interview question, Amy stated:

> *Not a lot – it was up to me to find the information I needed*.

On the other hand, some of the international students considered that linguistic or cultural aspects set them at a disadvantage, compared with Australian students. For example, Kim commented:

> ***Australia[ns] … maybe they can do quickly and better than me, how to find****. When they read a course profile about assignment,* ***they know … which [key]word they should put.***

However, Ali pointed out that it is inappropriate to generalise about international students' experiences since:

> ***It's very different for each country** … **Culture does affect it**, but it **also depends on one's experience.***

Echoing Ali's claim, the findings of this study show that the cultural and linguistic dimensions experienced by international students were nuanced and varied, as well as closely inter-related. Cultural and linguistic dimensions were intrinsic to the students' whole experience of using online resources. They were evident in the diversity of the students, their information-learning environment, and their approaches to using online resources (as outlined in Chapter 6).

In addition to interacting with online resources, the students needed to interact with people of diverse backgrounds, including other students, lecturers and information professionals. In their interactions with both online resources and people, the students negotiated various oral and written languages, social and educational practices, and knowledge-bases. However, the impact of linguistic and cultural dimensions varied from one individual to the next, as the following sub-sections show.

Linguistic dimensions

The students felt the impacts of linguistic dimensions in different ways. Thus, during interviews, the students described a variety of language-related strengths, as well as challenges in their online resource use (as outlined in Chapter 5). For example, their strengths were evident in various *notable search strategies* with which some students tackled language-related challenges when using online resources. In addition, Tom indicated the benefit of being able to source information from more than one language base as follows:

> *[Vietnamese Google] is good for me because with the same information **I can make link between the theory from what is written in English, and … any practice … in Vietnam.** And when I read in Vietnamese I know … research about our educational development in Vietnam. And I found it really difficult to find the statistics and information about Vietnamese education in English … [But] in Vietnamese … I find very good information and statistics … **that is the benefits I get from the two languages**.*

The text-based nature of online information resources and their varying styles posed challenges for some international students, who were using English as an additional language. For example, some students reported difficulty in selecting search terms

and synonyms, or quickly reading and evaluating online journal articles (as outlined in Chapter 6). In contrast, a few students from Malaysia and India said that they found working in English unproblematic, since English had been a principal language during their previous education. Thus, Cal (from Malaysia) explained:

> *Usually we're using English – I guess our repertoire – our vocabulary – is there.*

On the other hand, Pete who was a native English speaker from England, reported difficulties with reading and writing unfamiliar styles of academic English, which were similar to those reported by Sam (from India) and Van (from Sweden). Other students reported greater difficulty with understanding spoken English, in class or social settings, than with written English, as Tom explained:

> *They are all **printed on the screen** … **I understand that very well** … it's been very easy for me, because (if) I did find some of the words difficult to understand … I can look up my dictionary and I think I can guess the meaning.*

Sometimes students simply found it more practical to work in English rather than their principal language. Thus, Ali said:

> *I've always tended to go in English … because (if) it's an assignment for here, it'll just mean double work for me if it's in Indonesian … for me to have to translate into English.*

Cultural dimensions

With regard to cultural dimensions, the students tended to report mostly challenges, associated with:

- educational practices
- academic conventions
- interpersonal practices
- culturally-specific content of online resources

These are all significant considerations for an approach to information literacy which fuses information using and learning (Bruce, 1997, 2008; Lupton, 2004a, 2008).

Culturally-related challenges in using online resources often related to variations in educational practices between their home country and Australia. Thus, as Tom suggested:

> *When we talk about* ***cultural difference, [it is] just about the ways of learning****, more than in … information search online.*

For example, students from various countries (including India, Poland and China and Indonesia) mentioned that they found the emphasis on self-directed learning and online resources challenging, since they were used to alternative approaches. Han explained:

> *It's a lot of difference … When I came here … I don't know how to write these assignments … In India …* ***we are not used to the assignment stuff****. We have … exams and we have to go to … a lot of books …* ***We are not very much used to the library*** *…* ***We have our own books*** *… [It is]* ***teacher centred study not the student centred study*** *… What the teacher … teaches, we have to do … We have no choice … like here … [in Australia] they give us questions and assignments and we have to think about it … but in India it's not so … The answer is given by the teacher and we have to read and learn that one, and we have to write about that, like exactly like that same one. We cannot change that stuff … If we try to change it, we get zero marks …* ***But here we have to go to so many books for one assignment. We have to think [for] ourself, we have to … use our ideas*** *… But in India it is not so …* ***[In Australia] we had to sit in front of the computer*** *all the time.* ***Not in India, we never use a computer, we never use Internet*** *to find some information for our studies.*

When using online materials for assignments, students were sometimes challenged by unfamiliar academic conventions. For example, referencing and notions of plagiarism were problematic for some students, due partially to differing approaches to intellectual property around the world (Schmitt, 2005; Sowden, 2005). Politics of information access seemed to confuse Rod, who expressed concern that some information was deliberately "hidden" on the Internet. Since Rod was discussing difficulty in retrieving particular Chinese articles via *Google,* his view was perhaps coloured by previous experiences in his home country, where Internet use is officially regulated.

Students' culturally-related challenges often combined uncertainties about educational and interpersonal practices. For example, Lia described her hesitation to speak or ask questions in her Australian university classes, since she was used to a learning environment which valued attentive listening:

*Asian student, **we are taught by listening**, it's our **nature to listen rather than talking** and so in the group discussion … 90% [I] understand what they talk about, but … I don't want to say something … I try to change a little bit, since I come here I need to adapt to the culture here, but I have trouble … **In normal Chinese education we don't have seminars, just lecture, and only one teacher speaks** … Maybe 70 or a hundred students sitting, so **the class is very quie t… very respectful** … [We] used to ask questions after classes … **We are not allowed to ask questions on the class**. … Here … I just sit there and listen to what the lecturer says and I will definitely ask them questions, but after class … **I very, very seldom ask questions during class**. Even if I missed something, I don't understand, I will just leave it and … I won't ever interrupt.*

Interpersonal uncertainties also prevented some students from seeking help to use online resources. Han explained her reluctance to approach a librarian:

They are busy, I don't like to disturb them … this kind of thing is heavy in our mind.

Humour and culturally-specific content sometimes hindered the students' understanding and use of online information for their assignments. This point was illustrated previously, by examples relating to Australian government policy (Tom) and *Crocodile Dundee* (Liz).

Inter-related dimensions

The findings showed linguistic and cultural dimensions of international students' resource-using experiences to be inter-related. For example, Tom disclosed that embarrassment about his self-perceived language limitations prevented him from seeking help from the IT Help Desk in navigating the university's computer network. Consequently, for the first two weeks of his course, he was unable begin his studies, since he was unable to locate his timetable or access online resources. On another occasion, Tom was unable to gain access to needed resources, due to a combination of linguistic misunderstanding (of a single library jargon term) and unfamiliarity with library procedure:

*[I] search some of the books … in the library but **I didn't dare … to borrow** … because **I didn't understand the word 'loan'** … I mean, in some sense 'loan' … mean we have to pay money. **That's the language barrier** … I didn't have enough money to pay for everything so I didn't dare to go to the library to get loan because I thought that I had to pay some money.*

Fortunately, Tom eventually encountered an IT support person who by chance was also Vietnamese. The IT Support person provided the support – and importantly the encouragement - for Tom to embark on his course, and eventually to successfully graduate.

Tom's experiences indicate the potentially serious impacts of linguistic and culturally-related challenges on students' online resource use. Although Tom was a university teacher and administrator in his home country (Vietnam), he found himself unable to participate in his Australian course, due to a mix of unfamiliar technology and interpersonal uncertainties. Further conversation with Tom indicated that his reluctance, or limited confidence, to seek help had both linguistic and cultural connections. First, from a linguistic perspective, he was worried about not being able to articulate his problem, or not being understood by the IT Support person. Second, as an experienced academic, he was concerned about losing face by displaying limited knowledge and language capabilities to a technician. Tom's subsequent successful outcomes, assisted in part by the IT technician, indicate the need for linguistic and culturally-responsive information literacy learning support.

Shared experiences

It is important to note that linguistic and cultural dimensions are present in the resource-using experiences of all students, international and domestic alike. For example, Lyn described a case where international and domestic students viewed advertisements from each others' country. Both groups were unable to understand the intended message (or information) of the advertisement from the other country. Similarly, communication challenges are not solely attributable to English language limitations of international students, for as Mat claimed:

> *There are **lecturers who are not all that articulate** and … it is pretty tough at times to pick **the accent** ... and **I have been ... forced to do lip reading** on occasions ... there was one situation where we – the class - gave feedback to lecturer that he was not articulate and … he just said that a lot of the students have said that they can't understand what I've said, but I'm not in a position to do anything about it, so you should try to make efforts.*

Critical findings: Languages-Cultures

The following Table 7.6 outlines critical findings about the linguistic and cultural dimensions of international students' experiences of using online information resources to learn.

Table 7.6 Critical findings: Languages-Cultures

	CRITICAL FINDINGS: LANGUAGES-CULTURES
USING ONLINE RESOURCES	**Linguistic and cultural dimensions are:** ➢ inter-related ➢ intrinsic to international students' experiences of using online resources **Linguistic and cultural dimensions are evident in:** ➢ the students' personal, cultural and linguistic diversity ➢ the students' information-learning environment ➢ the students' strengths and challenges in using online resources **Linguistic dimensions are associated with:** ➢ interacting with online resources ➢ interacting with lecturers, IT support staff **Cultural dimensions are associated with:** ➢ educational practices ➢ academic conventions ➢ interpersonal practices - interacting with lecturers, IT support staff ➢ cultural knowledge / resource content
CRITICAL FEATURES	**Diversity** ➢ culturally and linguistically diverse students ➢ culturally diverse information-learning environment
	Shared experience ➢ international students - domestic students - cultural knowledge / resource content
IL LEARNING NEEDS	**Information literacy learning needs** Information literacy education that: ➢ responds to the linguistic and cultural diversity of students ➢ enables students to develop interpersonal confidence ➢ enables students to develop cultural knowledge and linguistic facility - international students and domestic students ➢ fosters learning and teaching approaches that respond to linguistically and culturally diverse students

The *critical findings* presented in this section indicate that linguistic and cultural dimensions were inter-related and intrinsic to the international students' resource-using experiences; they were associated with both strengths and challenges. The findings suggest the need within information literacy education to allow for international students' diverse cultural and linguistic attributes. Thus, in addition to

information-using practices, information literacy education needs to support the students' increasing familiarity with their educational and cultural context, and their developing English language facility; whilst building the students' confidence to seek help, and offering opportunities to participate in formal information literacy learning. Moreover, the findings indicate a need to foster cultural learning among international and domestic students, alike, as well as lecturing staff.

Connections: Students' Whole Experience of Using Online Resources to Learn

Gradually, through Chapters 5 and 6, I have presented findings relating to eight *elements* of the international students' experience of using online resources. Up to this point, I have considered the elements separately, but now I consider the connections between them, highlighting the *critical features*, which recur throughout the findings.

Inter-connected elements

As shown originally in Figure 6.1, the international students' experience can be represented as a complex of eight inter-connected elements. To recap, there are three *essential elements* and five *incidental elements,* as follows*:*

Essential elements (three key elements at the heart of the experience):

- *Students:* international students who are using online resources to learn
- *Information-learning environment:* Australian higher education environment; the culturally diverse online-intensive environment in which the international students are using online information resources to learn
- *Interactions:* instances of international students using online resources to learn; their active and intellectual engagement with online information

Incidental elements (five qualitative dimensions of the experience):

- *Strengths-challenges*: particular strengths and challenges experienced by international students in using online information resources to learn
- *Responses:* the international students' affective responses to using online information resources to learn

- *Information-learning*: ways the international students learn, and gain help, to use online resources; formal information literacy education and informal help
- *Reflections*: the international students' reflective responses to using online information resources; looking forwards and backwards
- *Languages-cultures*: linguistic and cultural dimensions of the international students' experiences of using online resources to learn

The study's findings show **multiple connections** between the various elements, reflecting the varied and **complex** nature of the students' experiences. Thus for example, some students reported feeling *annoyed or frustrated* [element: *responses*] due to the over-supply of online resources and search results [element: *challenges*]. Similarly, in selecting journal articles from a results list, some students experienced *challenges* in understanding academic English or Australian-centric content [element: languages-cultures].

In describing particular *interactions* associated with a database search, Len offered the following example (Table 7.7), which illustrates the inter-connectedness of several elements, namely: *challenges, languages-cultures* and *responses*.

Table 7.7 Example of inter-connected challenges

Interview extract: *When you don't find the articles, and you … are reading for hours and hours, and you are logically tired … at that moment you feel frustrated. But maybe it makes you again think 'OK – in which word is this?' And once you get the good one, so arise many results, positive results for you. So in this moment you feel the satisfaction: 'Ah that's good!' And be patient, and don't panic. Continue - and that's it.* (Len)				
	Interactions	**Challenges**	**Languages-cultures**	**Responses**
When you don't find the articles, and you …are reading for hours and hours	✓	✓		
and you are logically tired … at that moment you feel frustrated				✓ ✓
But maybe it makes you again think				✓
'OK - in which word is this?'			✓	
And once you get the good one, so arise many results, positive results for you.	✓			
So in this moment you feel the satisfaction. 'Ah that's good!' And be patient, and don't panic.				✓ ✓ ✓
Continue - and that's it.	✓			

Len's account indicates the connection between his language-related *challenge* in selecting appropriate search terms, his initial limited success in finding useful articles [*interactions*] and his feelings of tiredness and frustration [*responses*]. In addition, to inter-connections between elements, the findings show multiple connections within elements. Thus, Len's above example includes several different, but affective *responses.* However, it is interesting that his affective responses became more positive as he addressed his challenge and eventually gained positive results.

Similarly, Ann's following comment (Table 7.8) illustrates the various inter-related *challenges,* and brief instance of informal help [*information-learning*], and *responses* that she experienced when seeking information via an online journal database.

Table 7.8 Example of inter-connected challenges

Interview extract: *I had no* idea *[how] I can use it … And it wasn't very useful. And my friend came and showed me very quickly. He showed me Prequest* [sic] *and all that stuff. But I lost myself there. I don't know why. Too much information, wasn't organised very good, was hard to get to it, like too many search engines … And for me, because I have so many assignments, I don't have time to start looking in each search engine, so I'm just taking the very general things and taking the stuff out of it … So that was a problem … I wish I had time to investigate everything, but I just don't, so I don't waste time on it. And it's too much English in front of me so I don't like it (Ann).*				
	Challenges	**Information - learning**	**Responses**	**Languages - cultures**
I had no idea [*how*] *I can use it …*	*unfamiliarity* ✓			
And it wasn't very useful			✓	
And my friend came and showed me very quickly. He showed me Prequest [sic] and all that stuff.	*limited support* ✓	✓		
But I lost myself there. I don't know why.	*access and navigation* ✓		✓	
Too much information	*overflow* ✓		✓	
… wasn't organised very good, *was hard to get to it … too many search engines…*	*overflow* ✓			
And for me, because I have so many assignments, I don't have time to start looking in each search engine…I wish I had time to investigate everything, but I just don't …	*limited time* ✓		✓	
And it's too much English in front of me so I don't like it.	*language limitation* ✓		✓	✓

As shown above, Ann's challenges were associated with: her *unfamiliarity* with online resources and their use; the over-supply of information [*overflow*]; the organisation of the database [*access and navigation*]; her shortage of time for searching; and English *language* limitations. While Ann gained some informal assistance from a friend in addressing these challenges, it proved insufficient [*limited support*]. Unlike Len, Ann's continuing challenges are evident in her less positive affective *response* when she concludes "I don't like it". Ann's information literacy learning needs seem to include: understanding the purpose of databases; identifying appropriate information sources for her topic; handling the effects of information *overflow*; time management; English language development.

The study's findings, supported by Len and Ann's above comments, indicate the need for holistic information literacy learning responses that allow for the varied inter-connected elements of students' resource-using experiences. In particular, it is important to note the apparent synergy between students' successful *interactions*, positive responses and positive outcomes (and vice-versa). This would suggest that developing information-using understandings and practices, also supports students' developing confidence to address challenges and motivation to persevere

Critical features

The inter-connectedness of the international students' resource-using experience is also reflected by six recurring *critical features*, namely: *diversity, unfamiliarity, overflow, limited opportunities, shared experience* and *imbalance.* As shown in Chapters 6 and 7, the *critical features* are associated in differing ways with the eight elements outlined above.

Diversity is associated primarily with the international students, and with their information-learning environment. At their Australian university, the international students were immersed in an information-learning environment, whose culturally *diverse* and online-intensive nature reflected trends of international education. The international students featured in this study were characterised by their *diversity*, in terms of their personal attributes, cultural and linguistic backgrounds, educational and professional experiences.

Unfamiliarity, overflow and limited opportunities relate to various challenges that international students experienced in using online resources. The findings show that the international students brought an array of strengths to their information-using and learning, which included knowledge pertaining to varied cultural contexts and Internet-using skills. However, in using online resources, individual students experienced challenges associated with the *unfamiliarity* of various aspects, including: academic online resources; information-using and learning approaches; academic conventions, such as referencing; discipline-specific and information-use jargon; academic English; Australian cultural context; and interpersonal practices. The students also experienced challenges associated with what Nik described as information *overflow:* in other words, negotiating the wide array of resources available and managing the large amounts of information that often arise when using them. Despite the extensive challenges experienced by the students, the

findings show evidence of *limited opportunities* available to them. The students' reports suggested that they gained effective informal help from library staff, and sometimes friends. However, their formal information literacy education was mostly limited to library orientations and introductory information skills classes. The effects of *limited opportunities* are apparent in the students' unfamiliarity with academic online resources and challenges associated with information overflow.

A sense of *shared experience* is present throughout the study. Despite their marked diversity, all the international students were making a transition to life and study in Australia. In general, they reported similar transition-related uncertainties about their new social and learning environment, although the nature and intensity of their uncertainties varied between individuals. Moreover, I noted similar resource-using approaches and challenges among undergraduate and postgraduate international students, across CQU-BIC and QUT.

The findings highlight various contrasting aspects – or points of *imbalance* – in the students' resource-using experiences. In particular, there is evident *imbalance* between: the students' information needs and information use; their more successful information skills and limited information-using approaches; their considerable information literacy challenges and limited information literacy learning opportunities; and their more positive thoughts and less positive feelings about online resources. These various points of *imbalance* suggest a general *information literacy imbalance*, which I outline in the following section.

Information literacy imbalance

When viewed as a whole, the study's findings indicate an apparent *information literacy imbalance* in the international students' approaches to using online resources. As the following Table 7.9 shows, *information literacy imbalance* is evident in an array of information literacy strengths and challenges associated with: the international students' *personal attributes* as information users and learners**;** their *linguistic and cultural experiences*; and their *interactions* with online resources.

Table 7.9 Information literacy imbalance

INTERNATIONAL STUDENTS' INFORMATION LITERACY STRENGTHS	INTERNATIONAL STUDENTS' INFORMATION LITERACY CHALLENGES
Attributes as information users learners - Resilient - Positive response to using online resources - Prepared to seek help and learn	
Varied linguistic experiences	**English language limitations** - Vocabulary - Academic language and style - Comprehension
Varied cultural experiences	**Less familiar with Australian cultural context** - Literary and political allusions - Popular culture - Learning and teaching approaches - Academic conventions
Internet savvy - Experienced Internet users - Familiar with popular search engines	**Less familiar with academic resources**
Basic information skills - Searching and accessing information via Internet for personal and work purposes - Online communication - *Notable search strategies* (language-related)	**Limited information using approaches** - Less strategic - Less critical
Gain Informal help	**Limited formal information literacy learning opportunities** - Introductory, basic level

In terms of *personal attributes,* the international students showed considerable strengths, as resilient information users and learners. Despite the considerable resource-using challenges noted in Chapter 6, the students' responses to online resources were generally positive; they tended to persevere in using online resources for assignments; and they were willing to seek help and participate in information literacy learning.

The international students experienced both strengths and challenges relating to their varied *linguistic and cultural experiences.* Thus, the students brought considerable strengths to their resource use, through applying their varied linguistic and cultural knowledge. For example, I previously presented examples of individual students extending their information-base via home country Internet sites, and also applying *notable online strategies* to overcome English language limitations. On the

other hand, the students experienced challenges associated (among other things) with limited vocabulary for searching and unfamiliar cultural allusions and academic conventions.

With regard to the international students' interactions with online resources, *information literacy imbalance* is evident in: what resources the students used; how they used them; and how they learned, and gained help, to use them. Thus, *information literacy imbalance* is reflected in the international students' tendency to use the Internet and popular search engines such as *Google* (2008) rather than academic online resources. Similarly, *information literacy imbalance* is evident in the international students' tendency to demonstrate more successful basic information skills, and less strategic and critical information-using approaches. It is also apparent in the tendency for students to gain more informal help and limited formal information literacy learning opportunities.

There is a further *imbalance* between the international students' considerable information literacy learning needs (as identified in this thesis) and information literacy learning opportunities to address their needs. The scope and depth of the students' formal information literacy education was quite limited, consisting mainly of one-off sessions at a basic, generic level. Overall, there was little evidence of the students gaining coordinated or ongoing support for developing their critical understandings and use of online resources beyond the introductory sessions. This is surprising given the extensive information literacy programs offered at CQU (CQU Library, 2006; CQUniLibrary, n.d.) and QUT (QUT Library, 2009). Of further concern are apparent limitations in the knowledge or confidence of teaching staff to assist the students with their course-related use of online resources.

Critical Findings: The Whole Study

Gradually, through Chapters 6 and 7, I have created a word picture of international students using online resources, detailing each of the eight elements of their experience. In addition, for each element I have presented a set of *critical findings* to summarise key aspects of the students' experience and identify associated information literacy learning needs. In this way, I have responded to the study's two research questions:

RQ 1: *How do international students use online information resources for learning?*
RQ 2: *What are their associated information literacy needs?*

The following Table 7.10 draws together the *critical findings* for all eight *elements*[23]*.* The *critical features* of the students' online resource-using experiences are shown in the left-hand column. Their associated information literacy needs are shown in the right-hand column.

[23] An extended version of the study's critical findings is presented in Appendix Q.

Table 7.10 Critical findings: The whole experience - International students' online resource use and information literacy learning needs

CRITICAL FINDINGS: THE WHOLE EXPERIENCE International students' …	
Resource-Using Experiences	**Information literacy learning needs**
Students • *diversity* • *unfamiliarity* • *shared experience*	**To gain:** - greater support in their transition to life and study in Australia **To develop:** - greater familiarity with varied learning and teaching approaches for Australian higher education - especially self-directed, research-based learning
Information-Learning Environment • *diversity* • *shared experience*	**To develop:** - flexible information using and learning approaches for a culturally diverse, rapidly changing, online intensive information-learning environment
Interactions / Strengths-challenges • *Internet-using skills* • *notable search strategies* • *IL imbalance* • *unfamiliarity* • *shared experience* • *overflow* • *limited support:*	**To build on strengths:** - Internet-using skills - Varied linguistic and cultural knowledge **To develop:** - familiarity with the range of academic and specialist online resources - understandings about information-using principles and practices - reflective, strategic information using approaches - advanced information-using techniques - language facility: academic English, vocabulary, reading - familiarity with Australian cultural and educational context
Information-learning • *IL imbalance* • *unfamiliarity* • *limited opportunities* • *shared experience*	**To participate in:** - more extensive, ongoing, course-related information literacy learning **To develop:** - greater familiarity with library support services, online tutorials, online help
Languages-cultures • *diversity* • *shared experience*	**To develop:** - linguistic and cross-cultural facility - interpersonal confidence to access support and negotiate unfamiliar information-learning environment
Affective / Reflective Responses **More positive:** • *happy, satisfied, convenient, useful* • *new learning, cultural understandings, English language, empowerment* • *help - library and IT staff* **Less positive:** • *frustrated, annoyed* • *stressful, time-consuming, unsatisfactory outcomes* • *unfamiliarity* • *overflow* • *linguistic- cultural challenges* • *limited support for study in Australia*	**To gain enhanced experience of using online information resources to learn, through information literacy learning approaches that**: - are responsive to students' affective responses - build on more positive aspects identified by the students - address less positive aspects identified by the students - take account of students' recommendations

Conclusion

This chapter has completed the word picture of international students using online information resources to learn, by adding qualitative dimensions associated with how students learn to use online resources, their affective and reflective responses to using them, and linguistic-cultural influences. When viewed as a whole, the picture reveals the complexity of the international students' resource-using experience, which integrates eight inter-connected elements. The international students' experience is further characterised by several recurring themes, or *critical features*, which I have described as: *diversity, unfamiliarity, overflow, limited opportunities, shared experience* and *imbalance.* In particular, there is evidence of an *information literacy imbalance* between international students' more successful, but quite basic information skills and their less critical information-using approaches. Finally, I presented a set of *critical findings, which* summarised how the students used online resources and identified their associated information literacy learning needs. The following Chapter 8 discusses the implications of the findings in light of other research, before proposing an inclusive reflective *information literacy learning approach* to address the information literacy learning needs identified by this study.

8
Enhancing International Students' Information Using and Learning

The two preceding chapters revealed how international students' used online resources and identified an array of information literacy learning needs. In this way the findings provide insights which respond to the two research questions:
How do international students use online information resources to learn?
What are their associated information literacy learning needs?

In this chapter, I consider the implications of the study's findings and their contribution to the development of information literacy learning and teaching. First, I review the findings in light of other research (discussed previously in Chapters 2 and 3). Then, I consider the important role of the university libraries and librarians in supporting international students' information using and learning. Finally, responding to the information literacy needs identified by the study, I propose an *inclusive informed learning approach*, which draws on principles of *informed learning* (Bruce, 2008). To support this conceptual overview, I present a sample *inclusive informed learning activity* and several models representing the reflective process that underpins the proposed approach.

Reviewing the findings

In reviewing the findings, I demonstrate how this study contributes to a developing body of research [24] about international students' resource-using experiences and information literacy learning needs. I highlight fresh perspectives provided by this study and points of similarity with previous research. In this section, I focus on three key aspects, which relate respectively to the *complexity* of the international students' resource-using experiences, the students' *diversity and shared experiences,* and their *strengths and challenges* as information-using learners.

[24] See literature review, Chapters 2 and 3

Complexity of the students' resource-using experience

This study shows *using (online) information resources* to be a more complex experience than is usually indicated by previous research. Other researchers have tended to concentrate on particular aspects of information use, such as: information seeking (Liao, Finn & Lu, 2007; Mehra & Bila, 2007; Mittermeyer, 2005); information skills and database searching (DiMartino & Zoe, 2000; Varga-Atkins & Ashcroft (2004); computer literacy (Jackson, 2005); and academic library services and resources (Baron & Strout-Dapaz, 2001; Patton, 2004). In contrast, this study offers a multifaceted view of international students as information users and learners. As the previous Figure 6.1 shows, the international students' experience integrates eight inter-connected elements, namely: *students, information-learning environment*, *interactions* (active use of online resources), *strengths-challenges*, *information-learning, affective* and *reflective responses* and *cultural-linguistic dimensions.*

By representing the international students as information-using learners, the findings extend beyond information use as a set of skills, to using information as a part of learning (Bruce, 2008; Lupton, 2004a, 2008). In addition, while the above-mentioned research has concentrated mostly on students' information-using difficulties, this study shows a more varied mix of strengths and challenges.

This study shows that *affective responses* and *cultural* and *linguistic dimensions* are integral to the international students' whole experience of using online resources. Their *reflective* responses and metaphors add further insights and textures. Little other research has considered these inter-relationships, except for Mehra's (2004) study of international doctoral students' information seeking, which demonstrated the intersections between emotions and information actions in the cross-cultural learning process. Otherwise, while the literature shows growing awareness of the impact of emotion on information use (Nahl, 2007) and information literacy (Julien, 2007) few studies have concentrated on this aspect of international students' experience. In addition, other studies tend to consider languages and cultures only in terms of barriers or obstacles to information use (Baron & Strout-Dapaz, 2001; DiMartino & Zoe, 2000; Patton, 2002). Consequently, to demonstrate the inter-relationship of *affective* and *reflective responses,* and *cultural* and *linguistic dimensions* identified by this study, I created the following model (Figure 8.1). It reflects Kuhlthau's (2004, p. 206) notion of the information search process as an

interplay of *thoughts, feelings and actions*, but adds cultural and linguistic dimensions.

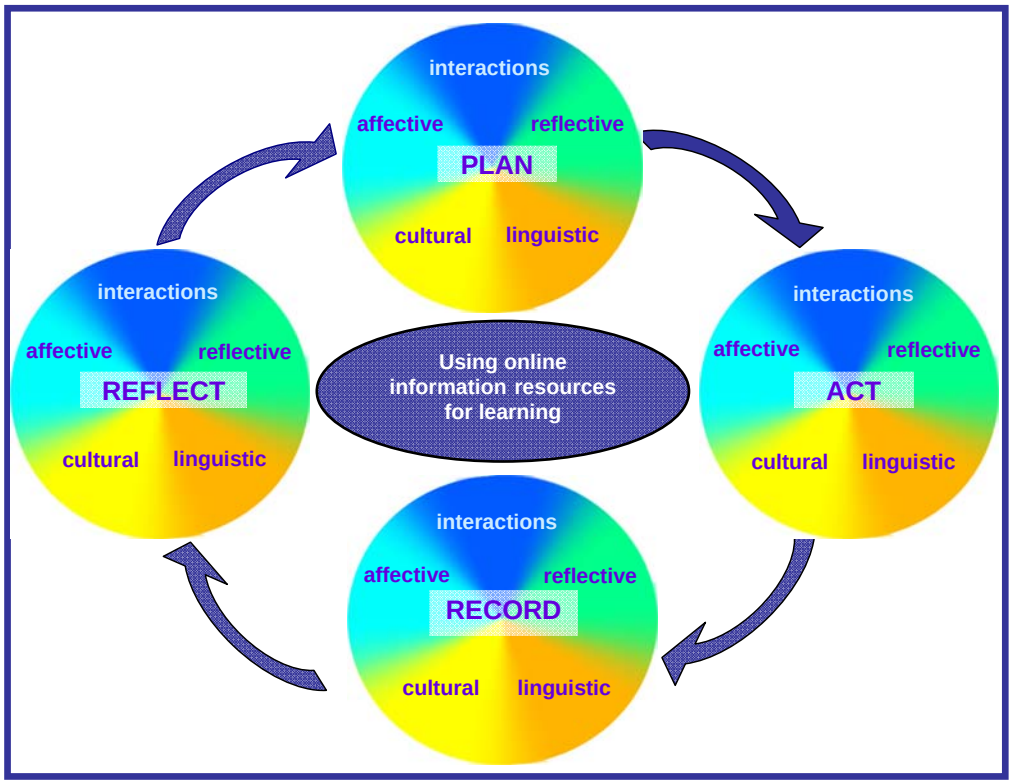

Figure 8.1 Interplay of interactions, responses and dimensions

The action research structure of this model reflects its association with the *Reflective online information use model* which is discussed later in this chapter *(Figure 8.3).* Both models show the integration of four phases - *plan, act, record* and *reflect* – in an information-using cycle. The relationship between the *elements* within both models is more complex and interwoven than the models' flat representation would suggest. Ezzy's (2002, p. 138) analogy of a "multidimensional tangled ball of wool", which describes interweaving threads of qualitative data, might also describe the interweaving of *interactions, responses* and *dimensions* identified by this study. Therefore, the inter-relationship of elements can also be shown as a multi-stranded woollen pom-pom (Figure 8.2 below).

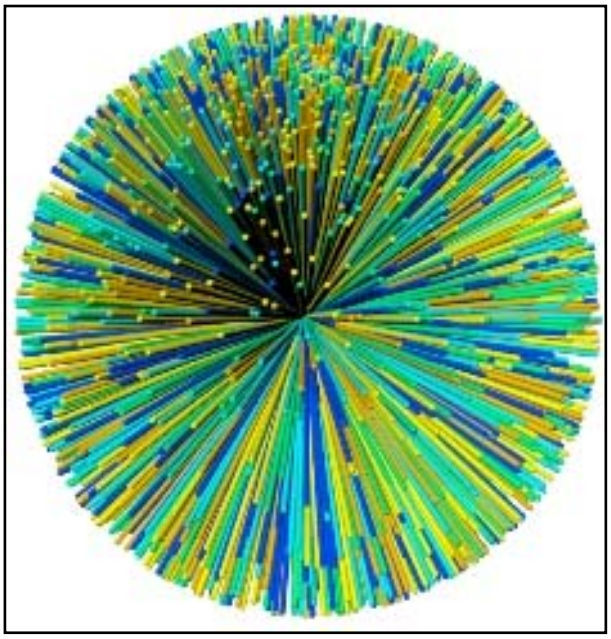

Figure 8.2 Interweaving of interactions and dimensions

The pom-pom represents a close-up view inside any of the four phases shown in Figure 8.1. The coloured strands represent the various elements: interactions (blue), affective and reflective responses (turquoise and green), cultural and linguistic dimensions (yellow and gold). Here, the strands are shown to be mixed, still identifiable as separate elements, yet bound together in the whole complex experience of using online information resources.

This *complexity* is further evident in the complementary aspects of *diversity* and *shared experience* identified by this study, as the following sub-section explains.

Diverse learners – Shared experiences

The findings of this study show that *diversity* and *shared experience* are complementary *critical features* of the international students' resource-using experience. *Diversity* relates to the students' varied personal attributes, knowledge and experiences, as well as the nature of the study population to which they belong. *Diversity* also implies the individuality of student experiences. In contrast, *shared experience* relates to the common ground international students share with each other and with the wider student population.

This study offers a close-up view of international student *diversity*. The participants came from a wider range of countries (15) than is commonly reported in information

use research. Moreover, they included countries less commonly represented in the international student literature, such as Mexico, Israel, Poland and England, as well as more commonly represented countries, such as China and Japan. The findings belie generalised anecdotes about international students as struggling second-language users, with limited knowledge of the world outside their home country. For example, while most of the students spoke English as an additional language, several were bilingual speakers, and one was a native English speaker. In addition, several had previously lived and worked or studied abroad before commencing their course in Australia.

The students' *diversity* was also evident in their varied *affective* and *reflective responses* to online resources. Students in this study reported a wider range of affective responses than is generally shown elsewhere. Researchers have tended to note more negative responses among international students, such as *library anxiety* (Battle, 2004); Onwuegbuzie, Jiao & Bostick, 2004), uncertainty whilst information seeking or using online resources (Patton 2002), and frustration in determining search terms and managing information (Patton 2002). Other researchers have shown that international students felt frightened, bewildered or overwhelmed by the unfamiliarity of information resources and practices (Macdonald & Sarkodie-Mensah, 1988; McSwiney, 1995). Mehra (2004) identified a wider range of affective responses among his 48 doctoral students. However, apart from feelings of pre-semester *excitement* and later *patience* and *enlightenment*, Mehra (2004) reported mostly negative responses, such as doubt, fear and confusion. In contrast, students in this study variously felt *excited, glad, frustrated* and *annoyed* about using online resources and thought that online resources are *fun, useful, boring and time-consuming* (Table 7.4). Their responses were nuanced and varied according to circumstances.

Despite the *diversity* noted above, this study's findings also show aspects of commonality – or *shared experience* – among the participants. It is particularly evident in the international students' **transition** experiences (Nelson & Kift, 2005). In this respect, the findings show similarities between this study's participants and international students elsewhere, both within and outside Australia. For example, the studies cited above included international students in the USA (Liao, Finn & Lu 2007; Mehra & Bilal, 2007), Canada (Mitermeyer, 2005), the UK (Varga-Atkins & Ashcroft, 2004) and Australia (McSwiney, 1995). Moreover, the various effects of *culture shock* (Furnham & Bochner, 1986) and change (Anderson, 1994)

experienced by this study's participants are common among people in general when moving between different social, cultural and educational environments. For example, the students' accounts of loneliness and social uncertainties are also commonly reported elsewhere (Brown & Holloway, 2008; Ryan, 2005). The international students in this study also shared some common ground with domestic Australian students, in terms of the diversity of their social, linguistic and cultural backgrounds (Department of Education, Employment and Workplace Relations, n.d.b.; McSwiney (2001).

With regard to **online resource use**, there is considerable evidence of *shared experience* among this study's participant group, for example in their:

- Internet *savviness* and basic information using skills
- limited previous experience of using online academic resources
- tendency towards using the Internet and *Google* for assignments
- tendency towards less strategic, less critical information-using approaches

The above patterns are similar for students at CQU-BIC and QUT, despite significant variations in the size and make-up of the student populations at each location. Moreover, echoing other research (Mehra & Bilal, 2007; Patton, 2002; Varga-Atkins, & Ashcroft, 2004), the findings show little difference between international undergraduate and postgraduate students' use of online resources, at CQU-BIC and QUT. Postgraduates tended not to use a wider range of resources nor more advanced strategies than undergraduates.

Research about university students' *first year experience* (Nelson & Kift, 2005) indicates that domestic students making the transition from school to university experience a range of transition challenges, which are often similar to those described by this study's participants. Moreover, first year student challenges reported by Nelson and Kift (2005) include information overload and technology use. In addition, Varga-Atkins & Ashcroft (2004), found no significant difference in the information skills of international and UK students at two British universities, where three quarters of all the students had inadequate skills. Very recent research (Head and Eisenberg, 2009) indicates further similarities in the experiences of this study's participants and university students across the United States. In particular, Head and Eisenberg 2009, p. 2) find challenges associated with information overload and various online resource-using challenges, concluding that: "research seems to be far more difficult to conduct in the digital age than it did in previous times".

Shared experience is most evident in the apparent **information literacy imbalance** identified by this study among the international students (Table 7.9). While these international students were apparently more computer *savvy* than students in previous studies, they tended to apply quite basic and uncritical approaches to using online resources. Similar evidence of *information literacy imbalance* has been reported elsewhere. For example, the tendency among this study's participants towards greater use of Internet search engines than other online academic tools has been noted among other international students by Liao, Finn and Lu (2007) and Mehra and Bilal (2007). Research from around the world shows that students in general make greater use of *Google* as a search tool for assignment information (Australian Bureau of Statistics, 2006; Lorenzo & Dziuban, 2006; OCLC, 2005; Pew Internet and American Life Project, 2007). In addition, the less critical information-using approaches identified by this study are also quite common among wider student populations, as shown by Armstrong et al. (2001), Brown, Murphy and Nanny (2003), Edwards (2006), Jones (2002), Logan (2004), Lorenzo and Dziuban (2006), OCLC (2005), and Paris (2002).

Information literacy imbalance is associated with an array of strengths and challenges experienced by international students, as outlined below.

Resource-using strengths and challenges

Research about international students tends to focus on difficulties that they experience in their host country. Similarly, this study reports various challenges associated with unfamiliar social environment, educational practices, linguistic and cultural context, and online resources. Unusually however, this research also identifies various information-using strengths.

With regard to *strengths*, in common with Robertson, Line, Jones and Thomas (2000), the study's findings show the international students to be generally motivated and resilient information users and learners. Although the students reported a range of challenges, and expressed mixed feelings about online resources, their accounts suggest that they tended to persevere in using them, often expending considerable time and effort. In addition, most of the students were regular Internet users, who successfully applied successful, if basic, information searching techniques.

Although other researchers (for example Mehra & Bilal, 2007; Moeckel & Presnell, 1995) reported limited previous computer use among international students, all except one student in this study had used a computer before coming to Australia. While a few students in this study reported technical difficulties associated with dial-up Internet connections and printing, their challenges generally related to negotiating online systems and resources, rather than the hardware itself. Contrary to other studies (Robertson, 1992; Di Martino & Zoe, 2000) no students reported difficulty in using an anglicised keyboard, or navigating the computer screen from left to right[25]. Thus, the findings of this study support Jackson's (2005) observation of a shift in recent years towards higher levels of computer use among international students on arrival at their host university.

This study also noted strengths associated with students' personal knowledge and multiple languages, which enabled some to access information sources beyond those commonly used in the Australian educational context. In addition, individuals demonstrated *notable search strategies* that assisted them in overcoming language-related challenges. Unlike students in Mehra and Bilal's study (2007), who were unaware of online language tools, students in this study often used different language versions of *Google* and functions such as the cache, to assist them in searching for and comprehending online information.

The study found that the students encountered four main resource-using *challenges* associated with u*nfamiliarity*, *information overflow, poor resource design* and *limited opportunities.* With regard to *unfamiliarity*, the international students in this study reported various challenges in their transition to life and study in Australia, which were similar to those reported elsewhere. These were associated with:

- cultural, linguistic and interpersonal uncertainties - noted also by Ballard and Clanchy (1997), Baron and Strout-Dapaz (2001), Mullins, Quintrell and Hancock (1995), Robertson, Line, Jones and Thomas (2000), Ryan (2005); Sawir, Marginson, Deumert, Nyland and Ramia (2008)
- unfamiliar educational practices - noted also by Ballard and Clanchy (1997), Baron and Strout-Dapaz (2001), Mullins, Quintrell and Hancock (1995), Robertson, Line, Jones and Thomas (2000), Ryan (2005)

[25] Including the Hebrew, Arabic, Chinese and Japanese speakers I questioned, who were familiar with alternative scripts and right to left textual direction.

However, as this study shows, the intensity and impact of *unfamiliarity* varied from one student to the next. Thus, for Tom the initial strangeness of his Australian university's administration and online processes prevented him from commencing study or seeking help for several weeks. On the other hand, Sun and Nik described quite cosmopolitan upbringings and professional experiences, which for them seemed to lessen the effects of *culture shock* (Furnham & Bochner,1986; Ryan, 2005). In this respect, the findings support Liao, Finn and Lu's (2007) suggestion that while international students still experience cultural and linguistic challenges, they tend to be less severe than previously reported.

Other researchers found that international students experienced interpersonal uncertainties or reluctance to seek help, due to unfamiliar social context, for example Liu and Redfern (1997), Macdonald and Sarkodie-Mensah (1988), McSwiney (1995), Mehra and Bilal (2007), Moeckel and Presnell (1995), Onwuegbuzie and Jiao (1997), Patton (2002), Varga-Atkins and Ashcroft (2004). However, in common with the findings of Liao, Finn and Lu (2007) the international students in this study only occasionally reported reluctance or interpersonal uncertainty in approaching library staff for assistance.

The students also experienced challenges associated with variations between their previous and current information-using contexts. In this respect, the findings support previous research showing:

- limited or no previous use of academic libraries - noted also by Allen (1993), Bilal (1989), Di Martino and Zoe (2000), Liao, Finn and Lu (2007), Liu (1993), McSwiney (1995), Mehra and Bilal (2007), Moeckel and Presnell (1995), Patton (2002), Sarkodie-Mensah (1986), Wales and Harmon (1998)
- limited or no previous use of academic resources, such as journal databases - noted also by Moeckel and Presnell (1995), Patton (2002), Selwyn, Marriott and Marriot (1999)
- unfamiliarity with resource-using practices, evidenced by basic information skills and uncritical approaches - noted by Di Martino and Zoe (2000), Mehra and Bilal (2007), Mittermeyer (2005), Patton (2002), Varga-Atkins and Ashcroft (2004)
- unfamiliarity with advanced Boolean strategies and bibliographic concepts such as search fields, publication types, volume and issue - noted also by DiMartino and Zoe (2000), Mittermeyer (2005), Patton (2002)

In addition, this study noted *unfamiliarity* in students' perceptions that the Web could meet all their study-related needs, as well as misconceptions, such as the need to pay to use academic resources.

As with international students elsewhere, some of this study's participants experienced linguistic or cultural *unfamiliarity* associated with:

- understanding unfamiliar jargon and academic English of online documents - noted also by Bilal (1989), Briguglio (2000), Seton and Ellis (1996)
- identifying search terms and synonyms; developing search strategies - noted also by Macdonald and Sarkodie-Mensah (1988), McSwiney (1995), Mehra and Bilal (2007), Patton (2002)
- academic conventions, such as referencing - noted also by Bretag (2004), Robertson (1992), Schmitt (2005), Sowden (2005)
- literary or political allusions, and humour - noted also by Macdonald and Sarkodie-Mensah (1988)

Information *overflow,* a term coined by Nik describes challenges associated with an over-abundance of information and information sources. The findings indicate that the students' challenges with information *overflow* were associated with the extensive range of online resources available; and the large amounts of information they needed to organise, evaluate and synthesise. As noted elsewhere, an abundance of information, or 'information clutter' (Mehra & Bilal, 2007) can be overwhelming (Di Martino & Zoe, 2000) and difficult for students to distinguish between (Patton, 2002). On the other hand, like Mehra and Bilal (2007), I noted that some student challenges related to under-supply, or limited results. Similar to Mehra and Bilal (2007) I noted further challenges associated with *poor resource design*. In this case, students mentioned various instances of confusing, visually unappealing interfaces and unintuitive navigation.

Although information literacy programs are strongly promoted at the students' universities (CQU Library, 2006; CQUniLibrary, n.d.; QUT Library, 2009) their resource-using challenges were compounded by *limited opportunities*, especially with regard to formal information literacy education. Some students indicated unawareness of support available, an issue noted also by other researchers, such as Ball and Mahony (1987), Hendricks (1991), Kumar and Suresh (2000), and Liu and Redfern (1997). In the following section I consider further the implications of this study's findings about the roles of the university libraries and librarians in

supporting the international students. While the findings are specific to the two research sites (CQU-BIC and QUT), attendant insights and recommendations have potentially wider relevance.

Implications for University Libraries and Librarians

In carrying out this study I acknowledge the vital role of the two university libraries – and librarians – involved in supporting the international students' resource-using and learning experiences. This section reviews key library-related findings, indicating considerations for ongoing development of information services and information literacy education for international students.

Commendations

The international students reported generally positive library using experiences, at both CQU-BIC and QUT. As shown in Chapter 6, all the students used their university library, in varying ways, drawing on resources in electronic and hardcopy formats, attending orientation and information skills sessions, and seeking help from library staff. On a personal level, the students mostly appeared comfortable about using the library and seeking assistance; evidence of *library anxiety* (Battle, 2004; Jiao & Onwuebuzie, 2001) or interpersonal barriers to using the library use was quite limited. Several students commented favourably on the quality of assistance they received and the professionalism of library staff. For example, Mat thought that:

> *The staff in the library are absolutely outstanding, in terms of their temperament especially, and their willingness to help.*

While Sun commented:

> *The library here - it's a beautiful place … Very helpful, extremely helpful. Well-grounded employees because they're dealing with so many cultures … computer-wise … how friendly they are … Above all they're humble … well-rounded individuals – not bossy or keeping a distance between the students. They're really, really helpful. I actually found them one of the most helpful departments at QUT.*

Recommendations

The library could contribute further to international students' transition by reaching out to students who may be unfamiliar with university procedures and unaware of where to seek help. Despite the wide range of online and printed information, information literacy programs and online tutorials, the findings indicate that the international students experienced a considerable array of information using challenges, often associated with *unfamiliarity* with online resources, and ways of accessing and using them.

From the **student perspective**, there is an evident need to enhance understandings (and dispel misconceptions) about:

- library procedures (such as borrowing)
- the university's online system, and expectations that students will use them for study and administrative purposes
- library and discipline-specific jargon (such as *loans* and *annotated bibliography*)
- the range, purpose and usefulness of academic resources available to them
- the connections between using information and learning - using online resources (process) and carrying out assignments (outcomes)

From the **library perspective** there are educational and cost-benefit issues at stake, associated both with student needs and the evolving nature of information and online publishing. This suggests a need for further research to examine why the students tend to use a limited number of the wide range of academic resources available. In addition to the general *unfamiliarity* identified by this study, there could be other contributing issues, such as the students' ability (real or perceived) to gain sufficient quality information from freely available sources.

Promoting academic online resources

The students' preference for freely available web-based information, and search tools such as Google and Yahoo reflect general trends (Australian Bureau of Statistics, 2006; Lorenzo & Dziuban, 2006; OCLC, 2005; Pew Internet and American Life Project, 2007). However, their identified *unfamiliarity* with academic online resources suggests a need for the library to more widely promote the range of resources available, in different ways, indicating the nature and purpose of specific

resources and their applicability to students' area of study. In particular, the following warrant further promotion:

- specialist databases, such as Australian Bureau of Statistics (ABS) (2008), Australasian Legal Information Institute (AUSTLII) (2008) *Aspect annual reports online* (2008) and *Factiva* (2008)
- discipline-specific journal databases, both stand-alone databases such as AUSTLII (2008) and those included in aggregated services such as *Criminal justice periodicals* via *ProQuest* (2008).
- the quality, usefulness and usability of academic online resources
- the cost-free access to online resources
- library guides and online tutorials

Improving online resources

Among suggestions for improving online resources students mentioned:

- clearer signposting and lay-out of online resource interfaces
- more visually appealing interface design
- subject-specific websites linking to select quality information
- website providing information about Australian social, cultural, political traditions
- a 'super search engine' for searching across all databases

Information literacy education

The students' limited familiarity with information resources and approaches, coupled with evidence of *limited opportunities* indicates a need for more extensive, contextualised information literacy learning opportunities. The students generally expressed a need for introductory sessions, and offered the following suggestions for improvement:

- more in-depth coverage of their subject area
- follow-up workshops later in the semester; 2-3 hour long or weekend workshops
- more flexible scheduling, beyond the first weeks of semester, to allow for unavoidably delayed arrivals, and variations in teaching periods
- face-to-face, hands-on instruction, rather than independent online tutorials

Importantly, the study's findings suggest the need for similar introductory sessions for undergraduate and postgraduate international students. The findings also suggested the need for further information literacy learning among some academic staff.

The *inclusive informed learning approach* outlined in the following section offers a basis for further developing the information literacy opportunities available to students at the two universities. It offers a focus for further developing collaborative partnerships between professionals in the library, academic, language and learning support areas (Badke, 2002; Conteh-Morgan, 2001, 2002; Elmborg & Hook, 2005; Peacock, 2005, 2008).

Responding to Information Literacy Learning Needs

This study's findings, supported by other research, have uncovered an apparent *information literacy imbalance* and an associated array of information literacy learning needs among the international students. While previous information literacy initiatives for international students have shown varying degrees of effectiveness[26], none to date has fully addressed the complex of needs identified by this study. Consequently, in this section I outline the framework for a proposed *inclusive informed learning approach*, which encompasses all eight *elements* of the international resource-using experiences (Figure 6.1). Drawing on principles of *informed learning* (Bruce, 2008), this proposed approach seeks to address international students' resource-using challenges, whilst supporting their learning and transition to life and study in Australia. It responds to international students' *complex* information needs, embraces their *diversity*, fosters *shared experience*, and enables them to build on *strengths* while addressing *challenges.* In this way, the inclusive *informed learning approach* represents an alternative to deficit models of information literacy education.

An inclusive informed learning approach

The complex nature of the international students' needs calls for a flexible information literacy learning response. I anticipate that the proposed *inclusive informed learning approach* offers a way for international students to address course-related information needs, whilst developing familiarity with social, academic, linguistic and cultural dimensions of their current information-learning environment.

[26] See Chapter 3 literature review

Overview

The *inclusive informed learning approach* promotes learning about – and with – (online) information. Although this study has focused on the use of online resources, this is only one aspect of the wider experience of *using information to learn* (Bruce, 2008; Lupton, 2004a, 2008). The general focus of the proposed approach would be on enabling students to develop strategic and reflective information-using approaches, rather than on teaching information skills. Thus, it would contribute to redressing the *information literacy imbalance* between the students' more developed information skills and less developed strategic and critical approaches.

The *informed learning* approach situates learning to use (online) information within the wider learning context of students' course requirements, graduate attributes (Barrie, 2006) and personal development. It is applicable to different learning purposes, across disciplines, enabling students to become aware of varying types of information within their current - and future - learning contexts. Thus for example, it could be applied to an education assignment, or to an IT unit of study, or across a whole MBA course. In this way, the *inclusive informed learning approach* represents an equitable, sustainable alternative to deficit, skills-based models that emphasise differences and difficulties. It would encourage international students to build on their strengths and share knowledge, extending learning opportunities across the wider culturally diverse Australian student population.

***Objectives of the proposed* inclusive informed learning approach**

The *inclusive informed learning approach* has two key objectives, as follows:

1) To enable international students to build on their information-using strengths, whilst continuously extending their resource-using understandings and practices, by:

- developing familiarity with, and confidence to use, a widening range of online information resources to meet their course-related learning needs
- developing strategies to use online resources and engage with information flexibly, critically, ethically and creatively
- managing the effects of information *overflow*
- reflecting on their information using and learning

2) To enable students to continuously extend their personal, academic, cultural and linguistic fluency, by:

- developing familiarity with, and confidence to engage with, varied information-using, learning and teaching practices to meet their course-related learning needs
- English language learning for using information in Australian and international academic and professional contexts
- developing interpersonal confidence to access support in using information and negotiating unfamiliar information-learning environments

The first objective relates mainly to the international students' *interactions* with online resources, while the second objective relates mainly to their engagement in their information-learning environment. It is important to note that both objectives are inter-related and therefore require pedagogical responses that jointly address students' learning-related use of (online) information and their general *transition* to life and study in Australia. The *inclusive informed learning approach* is learner-focused and therefore, as I explain below, the objectives support learning that is *inclusive, reflective, contextualised* and *integrated.*

Inclusive learning (Biggs, 2004) embraces the students' *diversity* and draws them into the academic mainstream, rather than promoting a different or 'special' approach for international students. It offers the opportunity for students of all backgrounds to *share* their varied knowledge, experience and learning. Therefore, the *inclusive informed learning approach* promotes equitable and sustainable education, enabling cross-cultural learning among international students, the wider student population and educators.

Reflective learning is essential to this approach, since in this study I noted generally uncritical and unstrategic information-using approaches among the international students. Reflection has been shown to support critical information use (Bruce, 2008; Edwards, 2006) and learning (Dewey, 1933; Kolb, 1984; Moon, 2004). Thus, an approach that fosters *reflective* learning would enable students to plan and evaluate all aspects of their learning-related information use.

Contextualised learning implies information literacy learning that is discipline or course-specific, rather than generic. *Contextualised* learning also responds to the findings that show international students often experience challenges associated with the unfamiliarity of their current educational and cultural context. Moreover,

Head and Eisenberg (2009) note that “finding context” may be the hardest part of the research process for university students. Thus, *contextualised* learning would enable international students to explore and develop their familiarity with knowledge and information sources pertaining to their host country, as well as context-specific educational practices, and academic conventions such as referencing. Importantly also, it would encourage international students to share their varied knowledge and experiences among themselves and the wider student population, thus potentially widening the information horizons of all. In this way, *contextualised* learning supports *inclusive* learning, and vice-versa.

Integrated learning responds to findings that show international students’ resource-using challenges are often closely connected with their language, cultural and academic learning needs. Therefore, the *inclusive informed learning approach* supports curriculum-based information literacy learning and collaborative teaching by lecturers, librarians, and language and academic learning specialists. In this way, the proposed approach would support integrative trends already underway (Badke, 2002; Conteh-Morgan, 2001, 2002; Dalglish, & Evans, 2008; Elmborg & Hook, 2005; Peacock, 2005, 2008).

Although this study is concerned primarily with the needs of international students, the *inclusive informed learning approach* would also assist students in general to negotiate a *shared* changing and internationalising online information-learning environment. In addition, it could support the information literacy learning and reflective teaching (Brookfield, 1995) of educators, whose information literacy approaches were shown by this study to be sometimes quite limited.

Having established the objectives and nature of the *inclusive informed learning approach,* in the following section I outline its conceptual basis.

Informed learning principles

Bruce’s recently developed *informed learning* (2008) provides the conceptual basis for the *inclusive informed learning approach. Informed learning* presumes that people learn by experiencing information in different ways and that there is an inextricable link between using information and learning (Lupton, 2004a, 2008). *Informed learning* suits the *complex* learning needs of international students since it accommodates multiple information-using situations and diverse forms of

information (Bruce 2008). Below I explain how *informed learning* supports *reflective, inclusive, contextualised, and integrated* learning within the proposed approach.

As Bruce (2008) explains, *informed learning* promotes a *balanced* information-using approach, whereby information use and learning are inseparable activities, and *reflection* is "integral to the experience of informed learning" (p. 79). Since *informed learning* is based on the *relational model of information literacy* (Bruce, 1997), it is concerned with the whole experience of using information. Beyond particular information skills, *informed learning* promotes critical, ethical and creative information using approaches. Therefore, it offers a means of redressing the *information literacy imbalance* identified by this study.

Informed learning is inherently *inclusive*. According to Bruce (2008, p. 7): "Informed learning supports social engagement, cultural understandings, social networking, community and peer support (including volunteer), shared learning and communicative learning". Therefore, *informed learning* offers the benefit of being responsive to the varied experiences and knowledge, strengths and needs of international students. It has the potential to assist international students in their *transition* to life and studying in Australia, by providing a way to learn about and negotiate unfamiliar academic, cultural and linguistic practices.

Informed learning supports *contextualised* learning, since it both fosters disciplinary (course-related) information use and empowers learners to "continue to learn in the many facets of their lives" (Bruce, 2004, p. 2). Consequently, it engenders learning that is transferable to new contexts, and potentially transformative. In addition, *informed learning* supports *integrated* learning since it is applicable across different disciplines, learning and information contexts (Bruce, 2008). By offering a conceptual framework for talking and teaching about information use, it could foster collaborative initiatives among the various professionals (for example, academics, librarians, language and learning support) who support international students' information literacy learning and transition. By embodying *informed learning* principles (rather than addressing particular skills), the proposed approach supports development of curriculum and pedagogy for culturally diverse educational contexts.

Learning and assessment

For developing learning and assessment activities the *inclusive informed learning approach* draws on three *critical elements* for *informed learners* which Bruce (2008, p.79) describes as:

- coming to experience the different ways of using information to learn (learning)
- reflecting on experience (being aware of learning)
- applying the experience to novel contexts (transfer of learning)

Learning and assessment activities would aim to incorporate all of the above three *critical elements.* Thus students would engage in active exploration and problem-solving, moving between more familiar and less familiar environments, supported by reflection. For example, within the context of an assignment, when a student experiences a challenge with information *overflow*, the educator might encourage the student to reflect on previous difficulties and outcomes. This might throw light on the present situation and suggest a way forward. Alternatively, the educator might suggest new search strategies for the student to try, asking the student to evaluate the results by comparing them with previous ones on the same topic.

The inclusive informed learning approach in practice

Practical implementation of the *inclusive informed learning approach* is outside the scope of this study. However, I offer the following sample activity to illustrate how the approach could support international students' information literacy learning. This sample activity draws on an assignment described by Lyn during her interview. As Lyn explained, in carrying out this assignment she experienced challenges associated with the unfamiliarity of the cultural context and inquiry-based approach.

Lyn's assignment involved researching and writing an essay about 'culture and advertising'. After considerable searching she found and used critical commentary about Tourism Australia's (2006) controversial advertising campaign *So where the bloody hell are you?* In this way she successfully completed her assignment. Building on this topic, the following example shows how students' learning could be enriched by an *informed learning* approach. This activity is designed to enable a reflective approach to using information, whereby students engage critically, ethically and creatively with information in various ways, whilst experiencing various cultural and linguistic perspectives.

A suggested inclusive informed learning activity

For this suggested *inclusive informed learning* activity, international and domestic students work together in project teams. They are required to develop a design proposal for an Internet advertising campaign, for an Australian hotel chain, aimed at increasing overseas and local visitors. Their proposal needs to be evidence-based, to demonstrate how it would be appealing and meaningful to potential visitors from various parts of the world. The students can present their proposal in any electronic format. Throughout this project each team member must write a reflective learning journal, focusing on critical incidents (positive or negative) that they experienced in the course of the project.

For stimulus, students: watch examples from Tourism Australia's (2006) controversial advertising campaign *So where the bloody hell are you?*; read two conflicting newspaper analyses of the campaign; and discuss with each other the cultural, linguistic and financial impacts of the advertisements. To further develop awareness of cultural and linguistic dimensions, students are encouraged to share their travel experiences, or their responses to advertisements from various countries

There are many ways in which students might be encouraged to explore and develop familiarity with online resources, such as:

- carry out various *interactions*, for example: gathering and compiling evidence; developing a concept map; project planning with team via a wiki; surveying potential visitors via Internet poll or blog; critiquing existing advertisements
- use two or more information types, for example: market profiles for different countries; incoming tourist statistics; visitor feedback; hotel or travel advertisements; travel writing and videos; research articles
- use two or more information resources, for example: blogs; YouTube (2008); journal or newspaper databases; online poll; specialist databases, for example: Australian Bureau of Statistics (2008); WARC World Advertising Research Center (2008).

The above *inclusive informed learning activity* enables students to engage with all three of the *critical elements in learning to be an informed learner* (Bruce, 2008, p. 79) which underpin the learning and assessment activities of the proposed approach. Table 8.1 below indicates which aspects of the activity correspond with each critical element.

Table 8.1 An inclusive informed learning activity

CRITICAL ELEMENTS *in learning to be an informed learner …*		
Experiencing different ways of using information	**Reflecting on the experience**	**Applying the experience to novel contexts**
using different online resources and approaches: - various interactions - various information types - various information resources	- writing reflective learning journal - focusing on critical incidents	- designing Internet advertising campaign presenting proposal in any electronic format
learning in different ways: - collaborative learning - international and domestic students in project teams independent research		
exploring different cultural perspectives: - Australian hotel chain, overseas and local visitors - appeal and meaning to international visitors - students share travel experiences, or responses to advertisements from various countries - conflicting newspaper analyses - discuss cultural, linguistic impacts		

Supporting international students as learners in transition

The *inclusive informed learning approach* outlined above aims to foster learners' continuing information use and learning, during and beyond their course. Thus, I anticipate that this approach can support international students' transition (Nelson & Kift, 2005) into and from their current information-learning environment. As the following Table 8.2 suggests, the international students (indeed all students) are learners in constant transition, through three phases indicated in the table as *from, here* and *towards* (equating to *past, present* and *future*).

Table 8.2 International students as information-using learners in transition

Students in transition		Student perspectives	This study's focus
inclusive informed learning	**from**	life experiences	understanding **who**: students' educational experiences, linguistic & cultural attributes
	here	information-learning environment	understanding **where**: culturally diverse online-intensive Aus HE
		interactions	understanding **what**: online resources the students use
			understanding **how**: students' approaches to using online resources
		dimensions	understanding **interplay of**: interactions - affective, reflective responses - cultural-linguistic experiences - in using online resources
		strengths-challenges	identifying information literacy learning **needs**
	towards	continuing information literacy learning for professional practice and personal well-being in a culturally diverse rapidly changing society	providing empirical basis to support development of **informed learning** approaches

In the above table, the blue arrow represents the continuous nature of *inclusive informed learning.* The column headed *Student perspectives* links particular elements of the study with each phase of the students' transition. The column headed *This study's focus* indicates the relevance of the findings to the students' transition. The top row of the table entitled *From* indicates where the international students have come from as individuals, as information users, and as learners. As this study shows, international students bring richly varied knowledge and experiences to their current learning. The middle row of the table entitled *Here* represents the students' experiences, as learners using online information resources for their current learning (at time of interview) at an Australian university. The study's findings offer an in-depth view of this moment in their transition, as their thoughts, feelings, cultural and linguistic dimensions convey the essence of what it is like to be an international information-using learner. The third row entitled *Towards* represents the students' ongoing *inclusive informed learning* through their current course, and beyond. By enabling critical, ethical, creative and reflective

uses of information, I anticipate that *inclusive informed learning* will support students' ongoing learning, professional practice and personal well-being in culturally diverse and rapidly changing environments

The model in Table 8.2 above builds on the findings of this study. It outlines key considerations for educators and information professionals when addressing international students' information literacy learning needs. For example, it could serve as a curriculum planning tool or discussion trigger. It supports the design and implementation of a whole student approach for learners to develop understandings, reflective and flexible information using approaches, and the confidence to explore different resources and strategies - beyond specific skills and online tools.

Supporting reflective information use and learning

As mentioned previously, the *inclusive informed learning approach* seeks to promote reflective information use and learning, as a means of redressing the *information literacy imbalance* identified by this study. In this section I introduce two conceptual models, which convey understandings about reflection. From a theoretical perspective, the models extend the concept of *information use.* From a learning perspective, the models offer a means of explaining and supporting reflective approaches. They also provide a conceptual basis for developing information literacy curriculum and pedagogy.

The two models presented below are part of a series of models which I developed in the course of this study [27]. In this way, the study contributes to a well established tradition of model building in the information disciplines (for example, Edwards, 2006; Fisher, Erdelez & McKechnie, 2005). Wilson (1999, p. 250) states: "A model may be described as a framework for thinking about a problem and may evolve into a statement of relationships among theoretical propositions". The underlying problem addressed by this study's models concerns the complexity of using online information resources to learn in culturally diverse online-intensive higher education environments. Conceptually, the models discussed in this thesis all build on a relational understanding of information literacy (Bruce, 1997) and reflect the connection between using information and learning (Bruce, 2008; Lupton 2004a).

[27] For other models see Figures XX

Reflective online information use model [28]

The *Reflective online information use model* (Figure 8.3 below) illustrates and supports the development of *balanced* information use promoted by the *inclusive informed learning approach.* This model represents continuous, interactive and reflective engagement with information in online environments, via online sources such as journal databases and library catalogues. In practice, this model has various possible applications for educators, learners and researchers. For example, it would be useful for scaffolding informed learning experiences, explaining and supporting reflective information use, and monitoring research progress.

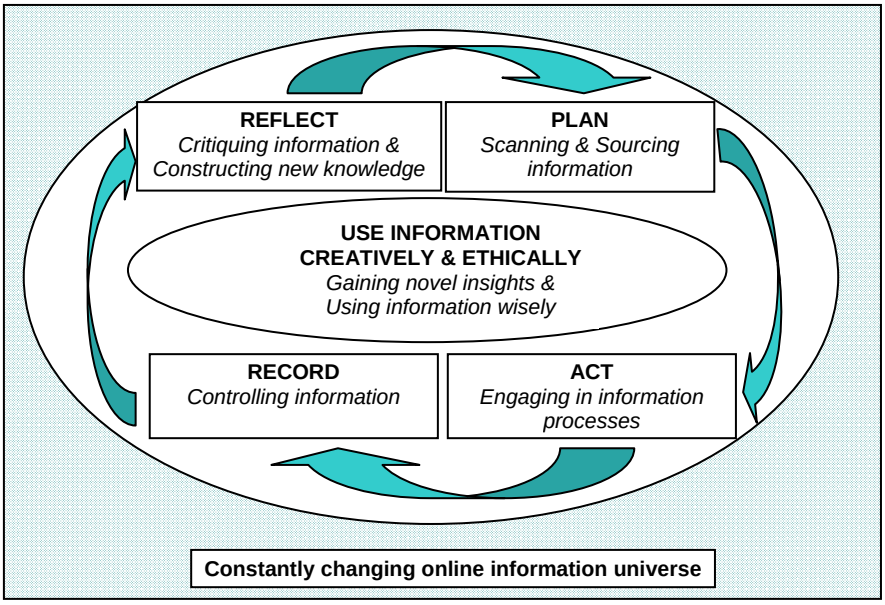

Figure 8.3 Reflective online information use model (Hughes, Bruce & Edwards 2007)

The above model refers to the following previous models: *Reflective information searching* (Bruce, 1992); *Reflective model for reviewing the literature* (Bruce, 1996); and *Action research model for reflective Internet searching* (Edwards & Bruce, 2002; Edwards, 2006). While the models each have a different emphasis, they share a structure reminiscent of action research (Kemmis & McTaggart, 1988; Zuber-Skeritt, 1992). Information use is represented as a continuous dynamic, with learners engaging in an information cycle of four phases: *Plan, Act, Record* and *Reflect*. Reflection is the unifying thread of the cycle. In accordance with reflective practice (Schön, 1987), reflection occurs continuously "in action" within each mini-cycle, as

[28] This section includes previously published material from Hughes (2006) and Hughes, Bruce & Edwards (2007)

well as “on action” at completion of the meta-cycle. The phases of the *Reflective online information use model* align with the *Seven faces of information literacy* (Bruce, 1997) as follows:

Plan relates to the first two *faces* of information literacy:

- *Information technology* – developing awareness of information technology and its use through scanning the information environment
- *Information sources* – finding information in information sources, successful information retrieval.

In this initial phase the user is concerned with investigating what online tools and resources are available and planning strategies for using them effectively to find information.

Act relates to the third *face* of information literacy:

- *Information process* – implementing information processes for problem solving

This phase involves applying the previously determined strategies in using the online tools and resources to satisfy an identified information need.

Record relates to the fourth *face* of information literacy:

- *Knowledge control* – storing and organising information

This phase involves activities such as saving, bookmarking, emailing and printing information found during the ACT phase to ensure its effective retrieval.

Reflect relates to the fifth *face* of information literacy:

- *Knowledge construction* – building up a personal knowledge base through critical analysis of information

The sixth and seventh *faces* of information literacy, represented here as **Use information creatively & ethically,** appear at the centre of the cycle, since they relate to both the purpose and outcomes of reflective online information use. They are:

- *Knowledge extension* – gaining novel insights through working with knowledge and personal perspectives
- *Wisdom* – using information wisely for the benefit of others

The model's *meta-cycle* of four phases - *Plan, Act, Record and Reflect* - can support any number of inter-related *mini-cycles* within each phase. Learners engage flexibly with information, passing through part or all of the meta-cycle once, several or many times depending on their information need(s). Learners may jump phases, backtrack or exit mid-way, completing one or several mini-cycles within a particular phase. Learners reflect on their information needs, strategies, *interactions* and results during the phases, and retrospectively on the whole experience and its outcomes. This model represents an "ideal" approach to online information use, where the four phases are inter-connected in a *balanced* cycle that integrates planning and reflection.

Integrated reflection model

Reflection is integral to the preceding model, where it forms a unifying thread within and between the four phases of information use. However, the model's cyclical format does not fully represent the recursive inter-relationship between the phases. Therefore, the following *Integrated reflection model* (Figure 8.4) offers a novel and more accurate representation of the networked relationship between the four phases, and the essential role of reflection in uniting them.

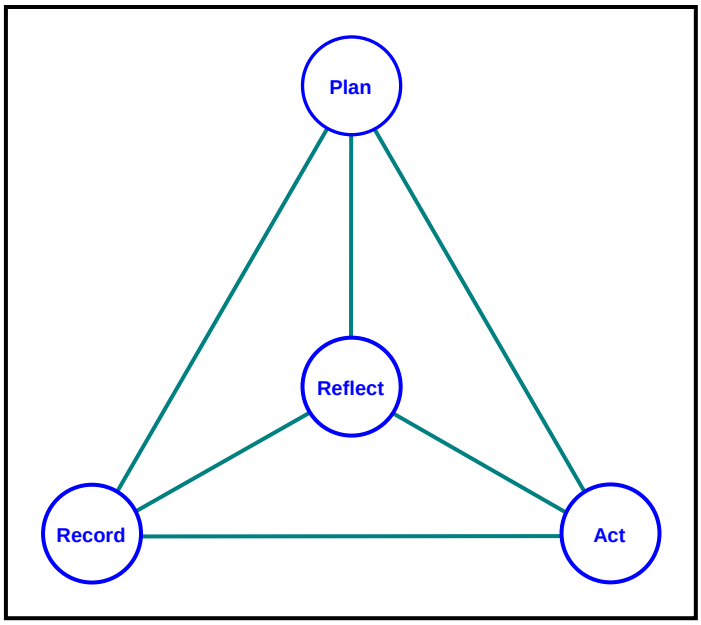

Figure 8.4 Integrated reflection model

With the *Integrated reflection model* the four phases - *Plan, Act, Record and Reflect* - are still inter-connected. However, reflection is shown to be central to the whole experience of using online resources, rather than as one phase in a cycle. All four phases are connected with each other and learners may proceed in any direction, depending on circumstances and information needs. Thus for example, a learner may still follow the established *Plan-Act-Record-Reflect* path, or progress through *Plan-Act-Relect-Plan-Record-Relect-Act-Reflect* (or other variations).

The various models featured in this thesis offer conceptual representations of reflective information use. They also mirror the reflective approach that I adopted in carrying out this research.

Reflecting on the Study

The study has an exploratory nature, which is evident in its overall purpose as well as its methodology. As explained in Chapter 3, the scope of the study widened from a relatively simple concern with international students' resource-using difficulties, to an investigation of international students' experience of using online information resources to learn. This entailed extensive methodological exploration and the gradual development of the *expanded critical incident approach* which underpins the study. The *expanded critical incident approach* proved effective for gaining extensive and varied insights into the international students' resource-using experiences. It allowed me to draw on the procedural strengths of critical incident technique (Flanagan, 1954), whilst compensating for its lack of theoretical underpinning.

Critical incident technique (CIT) offers a proven procedure for gathering and analysing data about human behaviours in real-life situations (Flanagan, 1954). It offered an investigative focus, whereby international students' assignments represented critical incidents for analysis. In the early stages of the study, CIT enabled me to identify international students' resource-using *actions* and associated difficulties and strengths. However, the semi-structured interviews and observed online task also yielded rich data about affective, reflective, cultural and linguistic dimensions, for which CIT's behavioural focus and binary categorisation proved inadequate.

The *expanded critical incident approach* allowed for methodological review and development as the investigation expanded and fresh data emerged. At a time when I was frustrated by the behavioural emphasis and binary analysis of critical incident technique, grounded theory (Glaser, 1998) opened my eyes to the potential of an emergent research approach. Thus, in developing the *expanded critical incident approach*, I drew on on a variety of qualitative research principles and practical strategies. For example, phenomenography (Marton, 1986) suggested a way of seeing the international students' experiences through an information literacy lens, while action research (Carr & Kemmis, 1986; Zuber-Skerritt, 1996) advised the data analysis framework. Naturalistic inquiry (Lincoln and Guba, 1985) offered principles to support my philosophical and ethical stance as a qualitative researcher.

The study also involved theoretical exploration. Through an extensive review of the literature, I gained insight into the varied ways in which concepts such as *information*, *information use* and *information literacy* can be understood and experienced. I also recognised the potential of drawing on concepts across disciplines. Thus for example, while this study is situated within information literacy research (Bruce, 1997), it is advised by select concepts from information behaviour, such as *context of information need* (Wilson, 1997) and the *interplay* of actions, thoughts and feelings in information seeking (Kuhlthau, 2004). The integration of these select, influential sources represent a useful cross pollination between kindred disciplines, which warrants further investigation.

Developments in information literacy research, notably Bruce's recently published *Informed learning*, also provided the impetus for pedagogical exploration. This resulted in the outline for an *inclusive informed learning approach*, which is introduced in Chapter 8. It is a natural outcome for this research, which intends in the longer term to support evidence-based pedagogical responses to international students' information literacy learning needs.

The results of this exploration are evident in the extensive findings (Chapters 6 and 7) which reveal the complexity of international students' online resource use and their associated information literacy learning needs. However, the exploration will continue, as I apply the findings of the study to the development of inclusive informed learning approaches and engage in further research about the experiences of international students.

Conclusion

In this chapter, I have discussed the implications of the study's findings, in the light of previous research. This discussion has indicated the need for a wide-ranging information literacy learning response to enhance international students' online resource-using and learning. Consequently, I have presented a conceptual outline for an *inclusive informed learning approach*, drawing on principles of *informed learning* (Bruce, 2008). I have explained that this approach could accommodate the complexity of international students' experience and support their information use, learning and transition to life and study in Australia. By fostering reflective information use it would offer a means for international students to redress the *information literacy imbalance*. By fostering inclusive learning it enables international students to develop familiarity with the academic, linguistic and cultural environment of their host university.

9
Conclusion

By revealing how international students use online resources, this study offers greater understanding about the experience of using information to learn in culturally diverse higher education. By identifying international students' information literacy needs, this study also contributes evidence for the ongoing development of information literacy learning. In this way I have responded to the two research questions first presented in Chapter 1:
How do international students use online information resources to learn?
What are their associated information literacy learning needs?

This final chapter draws the threads of the study together. First I summarise its key findings and research contributions. Then, critically reviewing the study's implementation and outcomes, I discuss both its limitations and successful fulfilment of the research aim and objectives. Finally, I offer recommendations for further research.

Key findings

In this study I have viewed international students through an information literacy lens, highlighting their diversity as information-using learners. I have presented the findings in two ways: as a multifaceted word picture and as a condensed set of *critical findings.* The word picture reveals the complexity of the students' experience of using online information resources to learn, while the *critical findings* identify information literacy learning needs. The key aspects are outlined below.

Complexity: The international students' resource-using experience is complex. It integrates eight inter-connected elements, namely *students, information-learning environment, interactions, strengths-challenges, information-learning, responses, cultures-languages* and *reflections*. Six recurring themes, or *critical features*, convey the essence of their experiences. These *critical features* are *diversity, unfamiliarity, overflow, limited support, shared experience* and *imbalance*.

Diversity describes the international students and their varied attributes and educational, professional, linguistic and cultural experiences. At their Australian universities, the international students were immersed in an *information-learning environment*, whose culturally diverse and online-intensive nature reflected wider trends of international education. Complementing the international students' personal *diversity*, there is evidence of *shared experience*. Individuals reported similar transition-related uncertainties about their new social and learning environment, although the nature and intensity of their uncertainties varied between individuals. Moreover, patterns of previous and current resource use and challenges were similar among the study's undergraduate and postgraduate students, across both universities. The *critical features* named *unfamiliarity, overflow* and *limited opportunities* relate to various challenges that the international students experienced in using online resources.

Strengths and challenges: The international students brought an array of strengths to their information-using and learning, which include linguistic and cultural knowledge pertaining to varied contexts, as well as computer-using and Internet-searching skills. However, in using online resources, students often experienced various challenges associated with the *unfamiliarity* of academic online resources; information-using and learning approaches; academic conventions, such as referencing; discipline-specific and information-use jargon; academic English; Australian educational and cultural context; and interpersonal practices. The students also tended to experience challenges of information *overflow,* associated with negotiating the array of resources available and managing the abundant information that they provided.

Despite the challenges experienced by the students, the findings show that the students gained quite limited opportunities for information literacy learning. Thus, while the students often reported effective informal help from library staff, their formal information literacy education was mostly limited to library orientations and introductory information skills classes. The effects of *limited opportunities* were apparent in the students' *unfamiliarity* with academic online resources and challenges associated with *information overflow*.

Information literacy imbalance: The findings highlight various contrasting aspects – or points of *imbalance* – in the students' resource-using experiences. In particular, there are evident *imbalances* between the students' information needs and

information use; their more successful information skills and limited information-using approaches; their considerable information literacy challenges and limited information literacy learning opportunities; and their more positive thoughts and less positive feelings about online resources. These points suggest a general *information literacy imbalance*, which reflects trends among the wider student population noted in other research (Chapter 2).

Need for enhanced information literacy education: The findings indicate the need for enhanced information literacy education that recognises the complexity of the international students' resource-using experiences and addresses the *information literacy imbalance*. Information literacy education needs to: foster 'balanced' resource-use that integrates active, critical, ethical and creative approaches; enable students to build on their strengths whilst developing their information-using understandings and practices; ensure increased and ongoing curriculum-based information literacy learning.

In response to the findings outlined above, I propose an **inclusive informed learning approach**, which would respond to identified information literacy learning needs and foster reflective information-using and learning. This approach would build on an understanding of the *interplay* between international students' *interactions* with online resources, their affective and reflective responses to using them, and the cultural and linguistic dimensions of their information use. It would foster international students' ongoing transition and learning (as shown in Table 8.2) by enabling individuals to draw on existing strengths whilst developing understandings and practices to support their academic pursuits. In this way, the proposed *inclusive informed learning approach* represents an alternative to deficit instructional models often present in information literacy education.

Research Contributions

This research makes significant contributions to knowledge about international student experiences, qualitative research methodology and information literacy theory and practice.

Contribution to knowledge about international students

The study's findings address identified research gaps about international students' online resource use and information literacy learning needs, especially within Australian higher education. This study offers a detailed, nuanced view of international students' real-life information using experiences. In addition, the study reveals significant information literacy learning needs. Confirming similar findings among the wider student population, I have identified an *information literacy imbalance* between the international students' generally well developed information skills and less developed critical and strategic approaches to using information.

Contribution to information literacy theory and practice

In this study I have reviewed information literacy research and contributed to the evidence-base for ongoing development of information literacy practice in culturally diverse environments. From a theoretical perspective, I have demonstrated the complex inter-connected nature of international students' resource-using experiences, and the need for information literacy responses to address this complexity. In addition, I have developed the concept of *information literacy imbalance* to describe a tendency that I noted, both in the literature and in the data emerging from this study (Hughes, Bruce & Edwards, 2007).

Whereas other research about online resource use tends to focus on information seeking, or searching databases and the Internet, this study considers the whole experience of *using online resources to learn.* In addition, by demonstrating the inter-connection of *information-learning environment* with other elements of the international students' experience*,* the study contributes to research about the role of context in information use (for example, Case, 2007; Kari & Savolainen, 2007; Lloyd, 2006; Wilson, 1997).

During this study I have reported research findings and conceptual developments through several refereed publications (as listed in the bibliography). In addition, I have developed a series of models to illustrate key concepts and support the development of inclusive reflective information literacy learning (Figures 8.1, 8.2, 8.3 and 8.4).

To support the ongoing development of information literacy practice, and in response to the learning needs identified by this study, I have developed a conceptual framework for an *inclusive informed learning approach* that incorporates principles of *informed learning* (Bruce, 2008). The *inclusive informed learning approach* aims to address the identified *information literacy imbalance,* by enabling students to draw on their varied strengths whilst developing critical approaches for using online resources to learn.

Contribution to qualitative research methodology

The study's quilt-like design, or *bricolage* (Denzin & Lincoln, 2005, p.6) innovatively incorporates various concepts and strategies. The *expanded critical incident approach,* which I devised and implemented for this study, builds on critical incident technique (Flanagan, 1954). With this approach I gained multiple perspectives through student narrative, factual reports, researcher observations and documentary evidence. The emergent word picture provides real-life insights about how international students use online information resources in the 'natural setting' (Lincoln & Guba, 1985) of their Australian universities.

Limitations of the study

This study is tightly focused on the experiences of 25 individuals and thus the findings are not necessarily representative of international students, either in terms of the Australian student population, or the populations of Central Queensland University Brisbane International Campus or Queensland University of Technology. While this relatively small participant group is conducive to in-depth qualitative research, it does not allow for statistical or probabilistic data analysis. The findings are intended to be descriptive and indicative, rather than predictive or generalisable. By offering personalized, contextualised insights about international students' resource-using approaches the findings alert educators to international students' varied strengths, challenges and information literacy needs as information-using learners in a culturally diverse context.

Since I intended an in-depth investigation of international students' experiences I did not interview any domestic students. Comparison of domestic and international

student experiences could both enrich and dilute the findings. Within the context of this study, a group of 25 domestic students would be no more representative of the culturally and socially diverse Australian student population, than the participant group is representative of the international student population.

The recruitment process proved challenging, and attracted a relatively limited number of international student participants, who were possibly more confident information users and learners. The general *information literacy imbalance* identified among this group raises questions about potential information literacy learning challenges of less confident international students. Cultural and linguistic uncertainties posed some communication challenges for data collection and analysis. The observed task compensated to some extent, as it enabled individuals to demonstrate rather than explain how they used online resources.

Data collection took place between 2003 and 2006. Given the rapidly changing nature of information and communication technologies and the online learning environment, the findings do not reflect recent developments and widespread use of Web 2.0 resources such as *Wikipedia* (2008), *Google Scholar* (2008), blogs, social networking sites such as *Facebook* (2008), *Youtube* (2008) and *Second Life* (2008).

Fulfilment of Research Aim and Objectives

Despite the limitations discussed above, the study successfully fulfilled its stated aim, which was:
To investigate how international students use online information resources to learn, and to identify associated information literacy learning needs.
The exploratory nature of this study produced extensive and varied findings, which enhance understanding about international students' online resource using experiences and information literacy learning needs.

As stated in Chapter 1, six research objectives guided the implementation of the study. The following Table 9.1 demonstrates how the research objectives were fulfilled.

Table 9.1 Fulfilment of research aim and objectives

Objective	Fulfilled…
(a) To gain deeper understandings about international students as information-using learners - through literature review, semi-structured interviews and observations	- Literature review: Chapter 2 outlines exiting knowledge about international students' personal and educational adjustment and information use - Data collection & analysis: Chapter 5 outlines the implementation of the expanded critical incident approach, which supported data collection via semi-structured interviews and observations - Findings: Chapter 6 introduces the 25 international student participants & their personal, educational, linguistic and cultural experiences
(b) To define the information-learning environment in which the international students are immersed - through literature review.	- Literature review: Chapter 2 describes the general internationalised online intensive higher education environment - Findings: Chapter 6 describes the participants' actual information-learning environment at one of two Australian universities
(c) To gain empirical evidence concerning the ways in which the international students use online information resources for study purposes - through semi-structured interviews and observation of an online task.	- Data collection & analysis: Chapter 5 (as above) - Findings: Chapter 6 outlines evidence about what resources the participants used and how they used them for assignments
(d) To identify international students' affective and reflective responses to using online information resources - through semi-structured interviews.	- Data collection & analysis: Chapter 5 (as above) - Findings: Chapter 7 identifies the participants' more positive and less positive affective responses to using online resources; and also their reflections on the experience of using, and learning to use, online resources
(e) To identify cultural and linguistic dimensions of international students' experiences of using online resources - through semi-structured interviews.	- Data collection & analysis: Chapter 5 (as above - Findings: (Chapter 7) identifies the cultural and linguistic dimensions (and impacts) of the participants' online resource-using experience
(f) To identify international students' resource-using strengths, challenges and information literacy learning approaches - through semi-structured interviews and observation.	- Data collection & analysis (Chapter 5) - Findings: Chapter 6 identifies aspects that participants found easy and hard about using online resources, indicating strengths and challenges. Chapter 7 outlines how the participants learned, and gained help, to use online resources.

The study's outcomes exceed the original objectives in two important ways. First, the findings create a multifaceted word picture, which not only outlines the various characteristics of the international students' online resource use, but also reveals

the complexity of the experience and the inter-relationship of its eight *elements* (*students, information-learning environment, interactions, strengths-challenges, information-learning, responses, reflections, languages-cultures*). Second, the findings support the development of an *inclusive informed learning approach* that addresses the international students' information literacy learning needs identified by the study. In this respect, the study approaches the longer-term intention associated with the research problem (p. 24), which is to support information literacy development within higher education.

As the following section indicates, the study also supports further research in several areas.

Towards Further Research

The study opens various avenues for further research, which include:

- **international student experience**, for example:
  - comparing these students' experiences with those of other international students, in different institutions, disciplines, or at later stages of their course
  - the impact of students' information literacy learning at their Australian university on their post-Australia professional practice or learning
  - aligning educator, or information professional perspectives, with international student perspectives on resource use and information literacy learning needs
- **information literacy imbalance**, for example:
  - further exploration of the nature and learning implications of *information literacy imbalance*, among international students and the wider student population
- **inclusive informed learning approach,** for example:
  - development, implementation and evaluation of *inclusive informed learning approach* in different learning contexts, or culturally diverse contexts
  - potential of *inclusive informed learning approach* to support international students' transition to and from life and study in Australia
  - *inclusive informed learning approach* as a catalyst for developing information literacy partnerships between academics, information professionals, language support specialists, researchers
- **reflective learning and research**, for example:
  - critical incidents to support reflective learning, or scaffold reflective journals

- critical incidents as a basis for reflecting on research, and/or monitoring research progress, and/or facilitating dialogue with research team

- **methodological development**, for example:
  - the potential of the *expanded critical incident approach* for other research
- **online resources and online learning environment,** for example:
  - impact of Web 2.0, changing online information-using and communication approaches, and associated information literacy learning needs
  - impacts of cultural-linguistic diversity on online information use and learning
- **conceptual development,** for example:
  - understandings about *information*, *information use* and *information literacy*
- **inter-disciplinarity**, for example:
  - conceptual cross-pollination between information literacy and information behaviour research
  - relationship between information literacy and information behaviour as kindred research disciplines

Conclusion

This study increases understanding about how international students use online information resources to learn. The findings highlight the complexity of international students' resource-using experience and identify an array of information literacy learning needs. The insights and recommendations arising from this study are of potential benefit across the whole student population. They support the development of inclusive reflective information literacy learning to enhance the experience and outcomes of international students, indeed all learners, in culturally diverse online-intensive higher education environments.

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Appendix A – Participant Information Sheet

International students' using online information resources for learning
RESEARCHER: Hilary Hughes
PhD Candidate – Faculty of Information Technology QUT
Lecturer in Teacher-Librarianship – Faculty of Education, QUT
RESEARCH SUPERVISORS:
Associate Professor Christine Bruce – Faculty of Information, QUT
Mr Michael Middleton – Faculty of Information Technology

DESCRIPTION OF PROJECT – What's it all about?

I am conducting this research project as a PhD student at QUT.
QUT has given me permission to carry out this research (ethical clearance reference – 2931H)
I am interested in learning about international students' experiences of using online resources (the internet, QUT Library catalogue and journal databases) for study purposes.
In particular I would like to find out if differences in students' linguistic or cultural backgrounds influence the ways that they search for information and use information in their learning.

POSSIBLE PROJECT OUTCOMES – What are the expected benefits?

It is expected that this research project will lead to a better understanding of the information experiences and learning needs of international students.
Project outcomes may foster:

- The development of strategies to enhance international students' use of online information resources for learning
- Improvements in the interface and usability of online information resources
- Enhanced inter-cultural awareness among students and university staff

INVITATION TO PARTICPATE IN THE PROJECT

International students (undergraduates and postgraduates) in their first year at QUT are invited to participate in the project.
Participants will have a private informal interview with me and do a simple search for information using the internet and online library resources.

- At the end of the interview you will have the opportunity to ask questions and seek advice about using online information resources for studies.

ARE YOU INTERESTED IN PARTICPATING IN THIS RESEARCH PROJECT?
Please see the next page for details……

PARTICIPANTS – Can <u>you</u> help?

8 -12 QUT international students are invited to take part in this project on a voluntary basis

- You should be an international student (undergraduate or postgraduate) in the first 12 months of study in Australia
- You must be over 18 years of age

WHAT'S REQUIRED
You will have an informal private meeting with me (Hilary Hughes) - lasting for 60 – 90 minutes.
During this meeting I would like you to tell me about how you search for information for assignments.
I shall ask you to think of an assignment you have done recently and describe how you used online information resources for it.
Then I shall ask you to carry out a simple search for information using online resources. And we'll talk about the search as you go along.

- There will be no right or wrong answers – this is not for assessment

VOLUNTARY PARTICIPATION
Your participation in the project is completely voluntary.
If you agree to participate it will not affect your relationship with QUT or your lecturers in any way. It will not affect your course grades

- You may withdraw from the project at any time, without any comment or penalty.

CONFIDENTIALITY
I assure you – and all participants - complete confidentiality.

No information that you give during the interview will be linked to your real name. You will be given a number and pseudonym (another name) to hide your identity. The interviews will be recorded and transcribed (typed up), but your name will not be included in audio tapes or written/electronic copies.

- Your name will not be published

CONSENT FORM
If you agree to participate in the project you will be asked to complete a Consent Form. This will guarantee your confidentiality and your right to withdraw at any time.

FEEDBACK
If you would like to receive a summary of the project results (after the project has been completed), please fill out the final section of the Consent Form.

CONCERNS AND COMPLAINTS
If you have any concerns or complaints - at any time - about the ethical conduct of the project, you should contact the Secretary of the QUT Human Research Ethics Committee on 3864 2902.

CONTACT DETAILS
To find out more about the project - or to volunteer for an interview – please contact:
Hilary Hughes
Email: h.hughes@qut.edu.au **Phone: 3864 3266**
QUT Kelvin Grove Campus

Thank you for your valued interest in this project
Hilary Hughes ~ October 2005

Appendix B – Participant Consent Form

RESEARCH PARTICIPANT CONSENT FORM

International students' using online information resources for learning

Researcher: Hilary Hughes

(QUT ethics clearance reference: 2931H)
Contact email: h.hughes@qut.edu.au
Phone: 3864 3266

Participant's statement of consent

- I have read and understood the information sheet about this project
- My questions about the project have been fully answered
- I understand that I can contact the researcher (Hilary Hughes) if I have any additional questions
- I understand that I am free to withdraw from the project at any time, without comment or penalty
- I understand that my confidentiality is assured.
    - My name will not be published - nor linked to any information I give
    - My personal and course details held by QUT will not be accessed for this project
- I understand that my participation in this project will not affect my relationship with QUT or my educational outcomes
- I understand that the findings of this research may be published as part of a PhD thesis, conference papers or journal articles; but participants will remain anonymous
- I understand that if I have any concerns about the ethical conduct of the project I can contact the QUT Human Research Ethics Committee on 3864 2902
- I agree to participate in the project

Name of participant
Signature **Date**

Researcher's declaration

I have explained to this participant the nature and purpose of the project. I have explained the possible benefits and risks of the project. I have answered the participant's questions.
I assure the participant's confidentiality and right to withdraw from the project at any time.
I have witnessed the above signature and I shall provide the participant with a copy of this signed consent form.

Name of researcher
Signature
Date

If you would like to receive a summary of the project findings - please fill in this section

Name
Address
Phone
Email

Appendix C – International Student Participant Details

	CQU BRISBANE INTERNATIONAL CAMPUS					
	Amy	**Ann**	**Bev**	**Cal**	**Jim**	**Kim**
Home country	Poland	Israel	Taiwan	Malaysia	Malaysia	Thailand
Principal language	Polish	Hebrew	Mandarin	Bahasa Malaysian / English/ Mandarin/		Thai
Other languages	English, some German	English, Polish, some Korean	English	Hakka (Chinese dialect)	Hakka (Chinese dialect)	English
Age **Gender**	20-30 Female	20-30 Female	20-30 Female	20-30 Male	20-30 Male	20-30 Female
Previous Higher Education	Poland - B Marketing Management; Master Market Management	None	Taiwan - B Business	Malaysia – Adv. Dip Bus Computing; Higher Dip Sys Analysis & Design	Malaysia – Dip, Adv Dip & Higher Dip in IT	Thailand - B Business Finance & Banking
Previous library use	Occasional - university	Not discussed	Occasional - public library	State, public & school lib (Malaysia); QUT	State & public lib (Malaysia); QUT	Sometimes school & university
Previous online use	Internet – used for study & personal; library catalogue - used	Not discussed	Internet – used for study	Internet – used for study	Internet – used for study	Internet - <u>not</u> used; library catalogue - used
Length of study in Australia	2nd semester at CQU	1 year at language coll; 1st sem at CQU	1 year at language coll; 1st sem at CQU	8 months at QUT; Ist sem at CQU	8 months at QUT; Ist sem at CQU	2nd semester at CQU
Current level	Postgraduate	Undergraduate	Postgraduate	Undergraduate	Undergraduate	Postgraduate
Current Course	MBA	Bachelor of Marketing	Master of HR Management	Bachelor of IT (E-commerce)	Bachelor of IT (E-commerce)	Post Grad Cert Business

	CQU BRISBANE INTERNATIONAL CAMPUS (continued)					
	Len	**Mak**	**Nik**	**Pat**	**Pete**	**Rod**
Home country	Mexico	Japan	Japan	Taiwan	England	China
Principal language	Spanish	Japanese	Japanese	Mandarin	English	Cantonese
Other languages	English	English, Spanish, Korean, Chinese	English, German	English, Taiwanese local language, Some Japanese	None	English, Mandarin
Age / Sex	20-30 Male	20-30 Male	30-40 Male	20-30 Female	40-50 Male	20-30 Male
Previous Higher Education	Undergrad Mexico - B Marketing Management; Dip TQM	Undergrad Japan - B Arts (3 yrs un-completed)	None	None	None	None
Length of study in Australia	1 year at language college & TAFE courses; 2nd sem at CQU	1 year at language college; 2nd sem at CQU	1 year TAFE; 2nd sem at CQU	2nd sem at CQU	3rd sem at CQU	2 years at high school; 1 year at TAFE; 1st sem at CQU
Previous library use	Occasional - university	Occasional -university	Not discussed	None	Occasional - school library	Not reported
Previous online use	Internet – personal use	Internet – used for study; Japanese databases – used; library catalogue – used	Internet – used for study	Internet – used for work & personal	Internet - not used	Internet – used for study & personal; Electric Library (database?) - used
Current study level	Postgraduate	Undergraduate	Undergraduate	Postgraduate	Postgraduate	Undergraduate
Current Course	Master of Information Systems	Bachelor of Tourism	Bachelor of IT	MBA	MBA	Bachelor of IT

	QUEENSLAND UNIVERSITY OF TECHNOLOGY (QUT)					
	Alf	**Ali**	**Ela**	**Han**	**Jan**	**Lia**
Home country	South China	Indonesia	China	India	Malaysia	China
Principal language	Mandarin	Indonesian	Mandarin	Punjabi	Mandarin	Mandarin
Other languages	English, Taiwanese	English	English	English, Hindi	English, Malay	English, German
Age **Gender**	20-30 Male	20-30 Female	20-30 Female	30-40 Female	Not reported Female	20-30, Female
Previous Higher Education	Bachelor of Finance	None	Bachelor (subject not reported)	BA, Master Economics	Foundation course; Diploma of Commerce	Bachelor of Finance
Prof/Life experience	Not discussed	School in Indonesia, UK & USA; worked 6 months in Canada; currently enrolled at QUT in Masters (Research)	Not discussed	Not discussed	Not discussed	1 year undergrad year in Vienna
Length of study in Australia	18 months	4 years at QUT – data relates to 1st 18 months as QUT undergrad	20 months	18 months	1 year	2 years
Previous library use	University library, limited	Not discussed	University library, limited	Limited	Not discussed	Limited
Previous online use	Internet – used for study	Internet & email – personal use	Not discussed	Internet & email – personal use	Internet – used for study	Not discussed
Current study level	Postgraduate	Undergraduate	Postgraduate	Undergraduate	Undergraduate	Postgraduate
Current Course	Master of International Business	Bachelor of International Business & Economics	Master of Accounting	Bachelor of Nursing	Bachelor of Business	Master of Commerce, Bank & Finance

	QUEENSLAND UNIVERSITY OF TECHNOLOGY (QUT) (continued)						
	Liz	**Lyn**	**Mat**	**Sam**	**Sun**	**Tom**	**Van**
Home country	Singapore	China	India	India	Palestine/Jordan	Vietnam	Sweden (Finnish parents)
Principal language	Mandarin	Mandarin	English	English / Punjabi	Arabic	Vietnamese	Swedish / Finnish
Other languages	English, Chinese dialect, French	English, Japanese	Tamil	Hindi, Maharashtrian, French	English, German	English	English, Danish Norwegian, German, Spanish
Age Gender	20-30 Female	20-30 female	30-40 Male	30-40 male	20-30 male	30-40 Male	20-30 Male
Previous Higher Education	Diploma in Mass Communications	Bachelor (subject not reported)	Commerce, Chartered Account-ant	Commerce, Accounting major	BA accounting	Not reported	College, Comput programming course
Prof/Life experience	Not discussed	Not discussed	Chartered accountant IT implementation, change Management	Export firm approx 3 yrs	Auditor with Deloitte	Academic; Manager University research & internat relations	Computer programmer, 2 yrs; 1 yr working holiday in Aus
Length of study in Aus	9 months	2 years	8 months	18 months	Approx 6 months	I year	10 weeks
Previous library	Not discussed	Limited	For work, not study	As a study place – did not use library resources	At school, twice at univ as undergraduate	University library - used a lot	High school
Previous online use	Internet – used for study; Proquest - used	Internet – for study (limited)	Email – used for work	Internet – used for study	Email, Internet – used for study	Internet – used for work & personal	Internet – used for personal
Current study level	Undergraduate	Postgraduate	Postgraduate	Postgraduate	Postgraduate	Postgraduate	Undergraduate
Current Course	Bachelor of Mass Communications	Master of International Bus	MBA	MBA	MBA	MLI	Bachelor of IT

Appendix D – Interview Schedule

International students using online information resources to learn
Research project (PhD)
Hilary Hughes, QUT
3138 3266 ~ h.hughes@qut.edu.au

Opening conversation

What is your home country?
What is your main language?
What other languages do you know?
What course are you studying at the moment at QUT?
How long have you been studying in Australia?
What other studies have you done? In Australia? Elsewhere?
Please tell me about any libraries you have used ….
Please tell me about any online information resources for study before you came to QUT?

- Internet ?
- Library catalogue?
- Journal databases?
- Other?

Recent assignment

Please think about an assignment that you have done at QUT that required you to search for information.

1. What was the assignment about?
2. What did you have to do for the assignment?

Resources checklist

3. What type(s) of information did you need for the assignment?
   (Refer to the resources checklist)

4. What types of resources did you use for this assignment?
   (Refer to the resources checklist)

Now please focus just on online resources and online tools …

5. What particular online resources and online tools did you use for this assignment?
   (Refer to the resources checklist)

Open-ended questions

Still thinking about the same assignment …

6. What did you find **hard** about using the online resources and tools?

7. What did you find **easy** about using the online resources and tools?

8. What help did you get in using online resources and tools for this assignment?
   - In person? - Print? - Online help? - Pilot online tutorial?

Looking back on the whole experience of doing this assignment …

9. Overall, would you say that using online information resources for this assignment was a positive experience – or was not a positive experience?

10. What makes you think it was a positive experience /was not a positive experience?

11. In what ways do you think being an international student affected this experience?

12. What do you think could be done to make online information searching a more positive experience for international students?

13. How would you sum up your thoughts and feelings in general about using online resources and tools?

Observed online task

Please note –

- *There is no need to hurry. Please take your time.*
- *There are no right or wrong answers.*
- *This will not affect your course grades in any way.*

Imagine that you have been set an assignment on the topic: *Prepare an annotated bibliography on effective public speaking techniques in business …*

Please show me how you would search for, and select, information on this topic – by doing the following things, and talking to me about what you are doing:

a) Identify appropriate search terms (keywords)

b) Log on to the **QUT Library** website

c) Use the **QUT Library catalogue** to select a useful book for the topic

d) Use a **journal database** to find and print a useful full-text article for the topic

e) Search the **internet** to find a useful web page for the topic

~~~ Thank you for your time, interest and cooperation ~~~

Appendix E – Resources Checklist

International students and their use of online information resources
Research project (PhD)
Hilary Hughes, QUT
3138 3266 ~ h.hughes@qut.edu.au

Resources Checklist

NEEDED INFORMATION

Please tick 1 or more boxes to show the type(s) of information you needed for your recent assignment.

TYPES OF INFORMATION	NEEDED
Definitions and meanings	
General information on a topic	
Statistics	
Current news	
Research findings	
Legal information	
Company information	
Academic articles	
Other(s) – please list: …	

TYPES OF RESOURCES USED

Please tick 1 or more boxes to show the type(s) of resources you used for your recent assignment.

TYPES OF RESOURCES	USED
Books	
Journal articles	
Newspaper articles	
Web pages	
Statistics	
Company information (annual reports etc)	
Academic articles	
Other(s) – please list:	

ONLINE RESOURCES USED

Please tick 1 or more boxes to show the particular online resources and online tools you used for your recent assignment.

ONLINE RESOURCES ***(Online materials)***	✓ **Used**		**ONLINE TOOLS** ***Indexes and search engines that help find and access online resources***	✓ **Used**
Journal articles / **e-journals**	♦ ♦		**Journal databases**, eg - ♦ Proquest ♦ Emerald ♦ Infotrac ♦ ACM digital library ♦ APAFT (Informit) ♦ Other(s) …	 ♦ ♦ ♦ ♦ ♦ ♦
Electronic books / **e-books**	♦ ♦		♦ NetLibrary ♦ CQU/QUT Library catalogue ♦ Other (s) …	♦ ♦ ♦
Web pages (general)	♦		**Search Engine**, eg – ♦ Google ♦ Yahoo ♦ Other(s) …	 ♦ ♦ ♦
Specialist information, eg ♦ Statistics ♦ Legislation, law reports ♦ Company information ♦ Other(s) …	 ♦ ♦ ♦ ♦		**Specialist databases**, eg - ♦ ABS (Australian Bureau of Statistics) ♦ AUSTLII ♦ CCH ♦ Connect 4 (Company Information) ♦ Other(s) …	 ♦ ♦ ♦ ♦ ♦
QUT course resources & guides ♦ Online reference ♦ Unit readings ♦ Subject/Information guides ♦ Other(s) …	 ♦ ♦ ♦ ♦		**QUT Library (website)** ♦ Library catalogue ♦ CMD (Course Materials ♦ Database)	 ♦ ♦

Appendix F – Research Questions and Interview Questions

		RQ1	RQ2
Research questions	*RQ 1: How do international students use online information resources for learning?* *RQ 2: What are their associated information literacy needs?*		
Interview questions	**Opening conversation**		
	What is your home country?		
	What is your main language?		
	What other languages do you know?		
	What course are you studying at the moment at QUT?		
	How long have you been studying in Australia?		
	What other studies have you done? In Australia? Elsewhere?		
	Please tell me about any libraries you use/have used….	✓	✓
	Please tell me about any online information resources you used for study before you came to QUT?	✓	✓
	Online resource checklist	✓	
	Think of a recent assignment …	✓	
	Q.1 What was the assignment about?	✓	
	Q.2 What did you have to do for the assignment?	✓	
	Q.3 What types of information did you need for the assignment?	✓	
	Q.4 What types of resources did you use for this assignment?	✓	
	Q.5 What particular online resources and search tools did you use?		
	Open-ended questions		
	Thinking of the same recent assignment …		
	Q. 6 What did you find easy about using the online resources and tools? Why?	✓	✓
	Q. 7 What did you find hard about using the online resources and tools? Why?	✓	✓
	Q. 8 What help did you get in using online resources and tools for this assignment?	✓	✓
	Q. 9 Overall, would you say that using online information resources for this assignment was a positive/not positive experience?	✓	✓
	Q. 10 What makes you think it was a positive/not positive experience?	✓	✓
	Q. 11 In what ways do you think being an international student affected this experience?	✓	✓
	Q. 12 What do you think could be done to make using online resources a more positive experience for international students?		✓
	Q. 13 How would you sum up your thoughts and feelings about using online resources and tools?	✓	
	Online task		
	Imagine that you have been set an assignment on the topic: Prepare an annotated bibliography on effective public speaking techniques in business …		
	Please show me how you would search for and select information on this topic using the library catalogue, a journal database and an internet search engine.	✓	✓

Appendix G – Focus Questions and Categories

INTERVIEW QUESTIONS	FOCUS QUESTIONS	CATEGORIES
None	What characterises the environment where students are using resources?	**Environment** • location • online domain
Opening conversation about: *Home country? Language(s)?* *What course at CQU/QUT?* *How long studying in Australia?* *Other studies? In Australia?* *Elsewhere?* *Libraries used?* *Online information resources used before CQU/ QUT?*	Who are the participants? Personal attributes? Cultural and linguistic experiences? Educational experiences? Previous online resource use?	**Students** • age • gender • home country • language(s) • education • professional exp • transition • previous resource
Think of a recent assignment … **Q.1** *What was the assignment about?*	How do they understand the assignment?	**Interactions** • assignments
Q.2 *What did you have to do for the assignment?*	How did they address the assignment topic & requirements?	
Q.3 *What type(s) of information did you need for the assignment?* **Q.4** *What types of resources did you use for this assignment?* **Q. 5** *What particular online resources and online search tools did you use?*	What online resources did they use?	**Interactions** • resources
Q. 6 & 7 *What did you find easy/ hard about using online resources and tools?*	What strengths & challenges do they experience in using online resources?	**Challenges** • strengths • challenges
Q. 8 *What help did you get in using online resources and tools for this assignment?*	How do they seek help & learn to use online resources?	**Info lit learning** • help-seeking • IL education
Q. 9 &10 *Overall, would you say that using online information resources for this assignment was a positive / not positive experience? What makes you think it was a positive / not positive experience?*	How do students view the whole experience of using online resources for learning?	**Reflections** • backwards reflections
Q. 11 *In what ways do you think being an international student affected this experience?*	What cultural and linguistic dimensions do they experience using resources?	**Dimensions** • cultural • linguistic
Q. 12 *What do you think could be done to make using online resources a more positive experience for international students?*	What information literacy learning needs do the students identify?	**Reflections** • forwards reflections
	What improvements do they suggest for online resource?	
	What improvements do they suggest for information literacy education?	
Q.13 *How would you sum up your thoughts and feelings about using online resources and tools?*	How do they think and feel about using online resources?	**Responses**
Online task: *Show how you would search for & select information* [on topic] *using the catalogue, a journal database, an internet search engine*	How do they use online resources?	**Interactions** • approaches

Appendix H – Information Needed

For a Recent Assignment, By Students

	CQU-BIC STUDENTS											
INFORMATION TYPES	**Amy**	**Ann**	**Bev**	**Cal**	**Jim**	**Kim**	**Len**	**Mak**	**Nik**	**Pat**	**Pete**	**Rod**
Definitions & meanings	✓		✓	✓	✓							not specified
General info on a topic	✓			✓	✓		✓			✓	✓	
Facts & statistics	✓	✓	✓	✓	✓		✓	✓		✓	✓	
Current news			✓	✓	✓					✓	✓	
Research findings	✓			✓	✓			✓		✓	✓	
Legal information				✓								
Academic articles	✓			✓	✓		✓		✓	✓	✓	
Company information	✓		✓	✓		✓	✓			✓		
Marketing plan		✓		✓								

	QUT STUDENTS												
INFORMATION TYPES	**Alf**	**Ali**	**Ela**	**Han**	**Jan**	**Lia**	**Liz**	**Lyn**	**Mat**	**Sam**	**Sun**	**Tom**	**Van**
Definitions & meanings		✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
General info on a topic	✓	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓
Facts & statistics	✓	✓			✓	✓	✓	✓		✓			✓
Current news	✓	✓	✓		✓			✓	✓	✓	✓	✓	✓
Research findings		✓		✓	✓		✓	✓	✓	✓		✓	✓
Legal information		✓	✓		✓			✓			✓	✓	
Academic articles	✓	✓			✓	✓		✓	✓	✓	✓	✓	✓
Company information			✓		✓	✓	✓			✓	✓		✓

Appendix J – Information Needed For a Recent Assignment, By Information Types

	CQU-BIC STUDENTS (11)		QUT STUDENTS (13)		
	Undergrad (5)[29]	**Postgrad (6)**	**Undergrad (5)**	**Postgrad (8)**	**Total**
INFORMATION TYPES	**n (%)**	**n (%)**	**n (%)**	**n (%)**	**n (%)**
Academic articles[30]	3 (60)	4 (67)	3 (60)	7 (87.5)	**17**
General information on a topic	2 (40)	4 (67)	4 (80)	7 (87.5)	**17**
Facts & statistics	4 (80)	5 (83)	4 (80)	4 (50)	**17**
Definitions & meanings	2 (40)	2 (33)	4 (80)	7 (87.5)	**15**
Current news	2 (40)	3 (50)	3 (60)	7 (87.5)	**15**
Research findings	3 (60)	3 (50)	5 (100)	4 (50)	**15**
Company information	1 (20)	5 (83)	3 (60)	4 (50)	**13**
Legal information	1 (20)	0	2 (40)	4 (50)	**7**

Note: The data shown in this table are drawn from information provided by the students on the *Resources checklist* (Appendix E) during the semi-structured interviews. The table represents the students' relative needs for particular types of information. The cells indicate the number and percentage of students within a particular group (for example, CQU-BIC postgraduates) who mentioned a need for a particular type of information. Thus, in the cell relating to *Academic articles / CQU-BIC STUDENTS - Undergrad (5):*

- 3 = the number of CQU-BIC undergraduates students who expressed a need for *academic articles*
- (60) = the percentage of the 5 CQU-BIC undergraduates who expressed a need for *academic articles*

In the above table, the data are ordered according to the overall total of students for each information type.

[29] Data not available for Rod

[30] Although *academic articles* might be categorised as *online materials*, they are included here since many students considered them to be a *type* of needed information)

Appendix K - Types of Resources Students Used For a Recent Assignment

	CQU-BIC STUDENTS												
RESOURCE TYPES	**Amy**	**Ann**	**Bev**	**Cal**	**Jim**	**Kim**	**Len**	**Mak**	**Nik**	**Pat**	**Pete**	**Rod**	
Books	✓	✓	✓				✓			✓	✓	✓	
Journal articles	✓	✓	✓	✓	✓	✓	✓		✓	✓			
Newspaper articles													
Web pages	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Statistics				✓	✓								
Company information	✓		✓			✓	✓			✓			
	QUT STUDENTS												
RESOURCE TYPES	**Alf**	**Ali**	**Ela**	**Han**	**Jan**	**Lia**	**Liz**	**Lyn**	**Mat**	**Sam**	**Sun**	**Tom**	**Van**
Books		✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	
Journal articles	✓	✓		✓				✓	✓	✓		✓	✓
Newspaper articles		✓	✓					✓		✓	✓	✓	✓
Web pages	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Statistics		✓			✓	✓	✓		✓	✓		✓	✓
Company information			✓		✓		✓			✓	✓		✓

Appendix L – Particular Online Information Resources Students Used For a Recent Assignment

ONLINE RESOURCES	CQU-BIC STUDENTS											
	Amy	Ann	Bev	Cal	Jim	Kim	Len	Mak	Nik	Pat	Pete	Rod
Journal databases												
Proquest	✓	✓		✓	✓	✓	✓		✓		✓	
Emerald	✓		✓			✓	✓			✓		
Infotrac	✓						✓					
APAIS										✓		
Internet search engines												
Google	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
Yahoo	✓			✓	✓						✓	
Infoseek							✓					
All the Web						✓						
Specialist info Resources												
ABS				✓	✓		✓	✓			✓	
Company websites				✓								
Connect 4			✓			✓						
CQU Library online resources												
CRO - Course resources online	✓			✓	✓		✓			✓	✓	
CQU Library catalogue												
Online reference												
Subject guides	✓						✓			✓	✓	
Other online resources												
Email	✓						✓					
Encyclopedia Britannica (own CD-ROM)												✓
MSN (Online chat)											✓	

ONLINE RESOURCES	QUT STUDENTS												
	Alf	Ali	Ela	Han	Jan	Lia	Liz	Lyn	Mat	Sam	Sun	Tom	Van
Journal databases													
Proquest	✓	✓				✓		✓	✓	✓	✓		
Emerald			✓							✓	✓	✓	
Infotrac													
ACM													✓
EBSCOHOST				✓		✓		✓		✓		✓	
APAIS													
Medline				✓									
ERIC												✓	
CINAHL				✓									
Blackwells		✓		✓									
Internet search engines													
Google	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓
Google Scholar													✓
Yahoo			✓			✓			✓	✓		✓	
Infoseek	✓												
Specialist info Resources													
ABS		✓				✓					✓		✓
ASX					✓								
AUSTLI I				✓	✓						✓		
CCH											✓		
Company websites							✓			✓			
delisted.com			✓										
EIU					✓		✓						
Government websites													
QUT Library online resources													
CMD – Course materials dbase		✓	✓	✓	✓		✓	✓		✓	✓	✓	
Lib catalogue		✓	✓		✓			✓	✓	✓		✓	
Online reference												✓	
QUT e-prints		✓											
Subject guides												✓	
Other online resources													
Copernic											✓		
Email											✓		
Phone											✓		
Keloggs University										✓			
Bloomberg Terminal										✓			
Online dictionary (via WWW)					✓								
Wikipedia					✓						✓		

Appendix M – Interactions Checklist

INTERACTIONS / CRITERIA[31]	YES	OTHER
1. Develop information use strategy		
♦ Develop overall strategy ♦ Define topic: *Public speaking techniques for business* ♦ Determine purpose: *Compile annotated bibliography* ♦ Understand/check terminology, eg: *annotated bibliography, public speaking* ♦ Develop information search plan		
2. Identify appropriate search terms		
♦ Break topic into 2 appropriate search terms, ie: *public speaking, business* ♦ Eliminate unnecessary words, eg: *annotated bibliography, effective*		
3. Log on to the Library website		
♦ Access CQU/QUT Library website (using links/typing URL) ♦ Access CQU/QUT Library catalogue		
4. Use the CQU/QUT Library catalogue – to identify a suitable publication		
♦ Enter search terms – must combine both elements: *public speaking, business*		
♦ Use appropriate search fields – keyword or subject		eg: author, title
♦ Modify search term(s), or search fields (if necessary)		eg: narrow from *communication* to *speaking*
♦ Select a relevant publication from the results list – must cover both elements: *public speaking* <u>and</u> *business*		
♦ Identify the: - title - author - edition - subject fields - publisher - date of publication - call number		
♦ Determine location of publication ♦ Determine the availability of the item in the catalogue record ♦ Explain process of finding the item in library with call number		
♦ Evaluate selected publication considering at least 2 criteria, eg: - type of publication - currency - relevance to topic		
5. Use a journal database - to identify a suitable **full-text** article		
♦ Access a journal database relevant to topic, eg: - *Proquest,Emerald*		eg: *ACM*

[31] In developing these criteria I drew on two information literacy tutorials: *Compass: Library help online* (CQU Library, n.d.) and *Pilot: Your information navigator* (QUT Library, 2006)

INTERACTIONS / CRITERIA[31]	YES	OTHER
♦ Enter search terms – combine both elements: *public speaking, business*		
♦ Use appropriate search fields – keyword or subject ♦ Apply appropriate search techniques: - Boolean logic (and/or/not) - full-text option (if present) - advanced search modes - limit by full-text - limit by Select scholarly/peer reviewed journals		
♦ Modify search terms/fields/techniques (if necessary)		
♦ Select a relevant full-text article from the results list - must cover both elements: *public speaking* <u>and</u> *business* - full-text		
♦ Identify the main citation elements: - article title - author - journal title - date of publication - volume and issue numbers - page numbers		
♦ Identify the abstract ♦ Explain the purpose/use of the abstract - concept of *summary* ♦ Use abstract to select item		eg: Identify / explain icons on results screen
♦ Demonstrate/explain download (print or save) selected article		
♦ Evaluate selected article considering at least 2 criteria, eg: – - Type of article (eg: academic, trade, case study, review) - Relevance to topic - Currency - Authority (eg: authors, referencing, refereed, evidence)		
6. Search the internet to find a suitable web-based publication		
♦ Access an internet search engine, eg: - Google, Yahoo		eg: *Ask Jeeves*
♦ Enter search terms – must combine both elements: *public speaking* <u>and</u> *business*		
♦ Apply appropriate search techniques: - boolean logic (and/or/not) - advanced search modes - *did you mean?* (Google) - non-English Google (eg. Chinese Google) - limit by last 3 months - limit by domain (URL) - other		*eg: near hits* (*Ask Jeeves*)
♦ Modify search terms/techniques (if necessary)		
♦ Select a relevant web-based publication from the results list - must cover both elements: *public speaking* <u>and</u> *business*		
♦ Evaluate the selected publication, considering at least 2 criteria, eg: - type of publication (eg: commercial, news, educational) - currency - depth/level of coverage - authority (eg: authors, referencing, evidence)		
7. Review overall information approach		

Appendix N – Results of the Online Task

INTERACTIONS	Strategy 20 students	Catalogue 20 students	Journal database 17 students	Search engine 20 students
PLAN				
developing information search plan	**none**			
defining topic	**a few (3)**			
understanding terminology: *annotated bibliography*	**a few (3)**			
identifying search terms: *business, (public) speaking*	**some (7)**			
eliminating unnecessary terms: *effective, techniques, annotated bibliography*	**a few (4)**			
ACT				
accessing QUT/QUT Library website	**v many (19)**			
accessing library catalogue/ journal database/ Internet search engine		**v many (17)**	**v many (15)**	**v many (20)**
Search terms				
entering combined search terms: *business, speaking/public speaking*		**some (8)**	**many (10)**	**many (12)**
modifying search terms		**some (6)**	**some (5)**	**a few (2)**
Search options				
selecting keyword search		**some (8)**	**a few (2)**	**none**
selecting subject search		**a few (3)**	**none**	**none**
selecting advanced search		**a few (1)**	**none**	**none**
limiting to full-text			**a few (4)**	
applying truncation symbol			**a few (1)**	
limiting to scholarly/reviewed journals			**a few (3)**	
limiting by campus		**a few (2)**		
following links / prompts		**none**	**a few (2)**	**a few (2)**
Search results				
selecting relevant publications: covers *business* and *public speaking*		**some (10)**	**a few (3)**	**some (5)**
identifying publication title		**many (12)**	**many (10)**	
identifying author		**some (6)**	**many (12)**	
identifying edition		**a few (2)**		
identifying publisher		**a few (1)**		
identifying date of publication		**a few (4)**	**some (8)**	
identifying volume / issue number			**some (6)**	
identifying page numbers			**some (7)**	
identifying subject headings		**a few (3)**	**a few (1)**	
identifying full-text			**a few (1)**	
identifying abstract			**some (7)**	
explaining purpose of abstract			**many (9)**	
identifying call number		**many (11)**		
identifying availability of resource item		**some (6)**		
identifying location of resource item		**a few (4)**		
locating in library by call number		**some (6)**		
RECORD				
printing/saving /downloading publication			**some (6)**	
REFLECT				
evaluating publication: applying at least 2 criteria		**a few (1)**	**many (9)**	**many (12)**
evaluating overall strategy	**none**	**none**	**none**	**none**

Different numbers of students completed different parts of the task (as shown in the table heading). Consequently this table records proportions of students who completed a particular part, as follows:
a few = less than one quarter of students who completed this part of the task
some = one quarter to one half of students who completed this part of the task
many = one half to three quarters of students who completed this part of the task
v many = more than three quarters of students who completed this part of the task
shaded = 'not applicable'

Appendix P – Information Learning and Help Seeking

	CQU-BIC STUDENTS												
	Amy	Ann	Bev	Cal	Jim	Kim	Len	Mak	Nik	Pat	Pete	Rod	
FORMAL IL LEARNING	✓			✓	✓								
Lib orientation													
Library into/ generic class	✓												
Course-related				✓	✓								
Learning Support Unit				✓									
INFORMAL HELP	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Lecturer/tutor	✓		✓				✓						
Librarian	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓		
Library guide													
Online tutorial													
Ask a librarian (online chat)													
Friend				✓	✓	✓	✓		✓		✓	✓	
INDEPENDENT LEARNING											✓	✓	
	QUT STUDENTS												
	Alf	Ali	Ela	Han	Jan	Lia	Liz	Lyn	Mat	Sam	Sun	Tom	Van
FORMAL IL LEARNING	✓	✓				✓		✓	✓			✓	
Lib orientation		✓							✓				
Lib into/ generic class	✓					✓		✓	✓				
Course-related												✓	
Learning Support Unit												✓	
INFORMAL HELP	✓	✓	✓	✓	✓	✓		✓		✓		✓	✓
Lecturer/tutor	✓	✓	✓	✓	✓								✓
Librarian	✓			✓	✓	✓		✓				✓	✓
Library guide												✓	
Online tutorial													
Ask a librarian (online chat)					✓								
Friend	✓			✓	✓					✓			
INDEPENDENT LEARNING		✓				✓							

Appendix Q – Critical Findings (Extended Version)

The following table outlines the study's *critical findings,* which respond to the two research questions:

RQ 1: *How do international students use online information resources for learning?*

RQ 2: *What are their associated information literacy needs?*

The *eight* elements of the international students' resource-using experiences are shown in the first column to the left. *Critical findings* for each research question are shown in the second and third columns. *Critical features* of the students' experience are shown in italics.

	CRITICAL FINDINGS: THE WHOLE STUDY	
	RQ 1: *How do international students use online information resources to learn?*	**RQ 2: *What are international students' information literacy learning needs?***
STUDENTS	**International students …** • Are characterised by their ***diversity:*** - personal attributes - cultural and linguistic attributes - educational experiences - professional and life experiences • Tend to experience ***unfamiliarity*** with: - academic online resources - learning and teaching approaches in Australian HE - social environment, interpersonal relationships ***Shared experience*** noted between: • international undergraduate and international postgraduate students, re: - previous information-using and learning experiences - transition challenges	**To gain:** - greater support in their transition to life and study in Australia **To develop:** - greater familiarity with varied learning and teaching approaches for Australian higher education - especially self-directed, research-based learning
INFORMATION-LEARNING ENVIRONMENT	**The international students' information-learning environment is …** ➢ Culturally diverse ➢ Online intensive **Their universities offer extensive information literacy education programs** ***Shared experience*** noted between: • international undergraduate and international postgraduate students (at CQU-BIC & QUT) • international and domestic students (at QUT)	**To develop:** - flexible information using and learning approaches for a culturally diverse, rapidly changing, online intensive information-learning environment

continued next page …

	CRITICAL FINDINGS: THE WHOLE STUDY	
	RQ 1: ***How do international students use online information resources to learn?***	**RQ 2:** ***What are international students' information literacy learning needs?***
INTERACTIONS	**In their interactions with online resources the international students tend to use …** • limited range of resources • free Internet resources • general journal databases **International students tend to experience …** • ***Imbalance*** between: - information needed ~ online resources used - successful basic information skills ~ less strategic, critical approaches • ***Unfamiliarity*** with: - the range of academic resources available ***Shared experience*** noted between: • International undergraduate and postgraduate students, re: - types of information needed and range of resources used - generally basic approaches - language-related challenges	**To build on strengths:** - Internet-using skills - Varied linguistic and cultural knowledge **To develop:** - greater familiarity with the range of academic and specialist online resources - deeper understandings about information-using principles and practices - reflective, strategic information using approaches - advanced information-using techniques - language facility: academic English, vocabulary, reading/scanning - familiarity with Australian cultural and educational context
STRENGTHS-CHALLENGES	**In their interactions with online resources the international students tend to experience …** • Strengths associated with: - Internet-using skills - Notable search strategies (language-related) • Challenges associated with: ***Unfamiliarity*** with: - academic online resources and information-using approaches - language: academic English, jargon - cultural context ***Overflow of:*** - information resources - information search results ***Limited support:*** - in learning about and using online resources	

continued next page …

	CRITICAL FINDINGS: THE WHOLE STUDY	
	RQ 1: ***How do international students use online information resources to learn?***	**RQ 2:** ***What are international students' information literacy learning needs?***
INFORMATION-LEARNING	**In learning to use and gaining help to use online resources the international students tend to experience …** • ***Imbalance*** between: - more informal help-seeking ~ less formal information literacy - education - information literacy learning needs ~ limited opportunities • ***Unfamiliarity*** with: - help available - online tutorials • ***Limited support*** in**:** - learning to use online resources ***Shared experience*** noted between: - international undergraduate and international postgraduate students - CQU-BIC & QUT - re: information literacy learning needs	**To participate in:** - more extensive, ongoing, course-related information literacy learning opportunities **To develop:** - greater familiarity with library support services, online tutorials, online help
LANGUAGES-CULTURES	**Linguistic & cultural dimensions are…** • inter-related • intrinsic to international students' experiences of using online resources Linguistic and cultural dimensions are **evident** in: • the students' personal, cultural and linguistic ***diversity*** • the students' ***culturally diverse*** information-learning environment • the students' strengths and challenges in using online resources International students **experience** linguistic dimensions in: • their interactions with online resources • educational practices • academic conventions • cultural knowledge / resource content • their interactions with lecturers, IT support staff ***Shared experience*** **noted** between: • international students - domestic students, re: - cultural knowledge/resource content	**To develop:** - linguistic and cross-cultural facility - interpersonal confidence to access support and negotiate unfamiliar information-learning environment

continued next page …

<table>
<tr><th></th><th colspan="2">CRITICAL FINDINGS: THE WHOLE STUDY</th></tr>
<tr><th></th><th>RQ 1: How do international students use online information resources to learn?</th><th>RQ 2: What are international students' information literacy learning needs?</th></tr>
<tr><td>RESPONSES</td><td>The international students' affective responses to online resources indicate …

• More positive - students are happy, satisfied because:
- online resources are convenient, useful
- online resources provide information for assignments, widen knowledge

• Less positive - Students are frustrated, annoyed because:
- online resources are unfamiliar, poorly designed, expensive to use [unfamiliarity]
- using online resources causes physical discomfort
- online resources provide too many results, unreliable results [overflow]

• Imbalance between:
- international students' more positive thoughts ~ less positive feelings</td><td rowspan="2">To gain enhanced experience and outcomes of using online resources, through information literacy learning that:
- is responsive to students' affective responses
- builds on more positive aspects identified by the students
- addresses less positive aspects identified by the students
- takes account of students' recommendations</td></tr>
<tr><td>REFLECTIONS</td><td>The international students' reflective responses to the whole experience of using online information resources to learn indicate …

• Overall, the international students consider the whole experience of using online resources to be positive

• More positive - using online resources:
- opens up new knowledge, learning
- develops cultural understandings
- develops English language
- develops personal empowerment

• Less positive – using online resources:
- is stressful, time-consuming
- leads to unsatisfactory outcomes – too much/too little information
- linguistic-culturally related challenges

• More positive – information literacy learning
- help from library and IT staff
• Less positive – learning support
- limited support for study in Australia</td></tr>
</table>

PhD Graduation Citation – Hilary Hughes – 2 June 2009

Hughes, Hilary Eva Mary

BA Combined Honours (Spanish and Romance Linguistics), University of Birmingham, UK

MA (Librarianship), University of Sheffield, UK

Thesis Title:

International students using online information resources to learn

Supervisors:

Professor Christine Bruce (Principal)

Professor Susan Danby (Associate)

Dr Michael Middleton (Associate)

Citation:

This qualitative study used an *expanded critical incident approach to* investigate international students' learning-related use of online information resources, at two Australian universities. The study identifies information literacy strengths and needs, and recommends the development of inclusive reflective approaches to information literacy learning for culturally diverse higher education.

The study reveals a complex relationship between international students' interactions with online resources, and their associated strengths and challenges, affective and reflective responses, cultural and linguistic dimensions. Whilst contributing new knowledge about international student experiences, the study advances information literacy theory and qualitative research methodology. The findings and recommendations of this study are of potential interest to university educators, researchers, information professionals and learning support specialists, as well as online learning and resource designers.