Evaluating the Usability of Library Services Accessed
Via EBSCO Host Mobile

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A minor thesis in partial fulfilment of the requirements for the Degree of
Master of Information and Library Studies

National University of Ireland
University College Dublin

School of Information and Library Studies

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August 2010
To Siobhán
ACKNOWLEDGEMENTS

I would like to thank my supervisor, Dr. Judith Wusteman, for all of her assistance throughout this project. I would also like to express my gratitude to Marie O’Neill for all of her help throughout the year and for granting permission to use students in Dublin Business School as participants in my study. Thank you also to the library staff of Dublin Business School. My thanks go to the six students who generously gave me their time in participating in the usability testing. Finally, a sincere thank you to my parents who have been so generous in their support of me throughout the year.
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ABSTRACT

Statement of the Problem: In recent years, academic libraries have started to examine the possibility of providing more of their content and services via the new platform of Web-enabled mobile devices such as iPods and smartphones. One such service is EBSCO Host Mobile which provides access to articles from EBSCO databases via Web-enabled mobile devices. Prior to this test, no usability test has been done to see if Irish students find such a service usable.

Purpose of the Study: This research sets out to examine whether the library and information services that the EBSCO Host Mobile application provides are usable by its target audience. The application was assessed using the usability attributes of learnability, navigation, efficiency, effectiveness and aesthetics.

Methodology: The methodology chosen was usability testing. This consisted of a pre-usability test questionnaire, a “think out loud” usability test and a post-usability test questionnaire.

Findings: Overall, the application is usable. However, problems exist in terms of the usability attributes efficiency and effectiveness.

Recommendations: Suggested changes to the interface are described and mockup versions of the suggested new interface are presented as screenshots. It is recommended that Irish third level libraries should try to ascertain if there is a demand for library services via Web-enabled mobile devices. Mobile-optimised versions of their library websites and other mobile services such as this application could then be provided.
Introduction

This chapter provides an introduction to the thesis. It explains the background to the research, the reasons why the research is significant, the purpose and design of the study and the research aims and objectives. Finally, some of the limitations of the thesis are outlined.

1.1 Statement of the Problem

In recent years, smartphones, such as the iPhone, have become increasingly popular. Academic libraries have started to examine the possibility of providing more of their content and services via this new platform. One of the services that libraries can provide to students is to make articles from their databases available via mobile devices. One such service is EBSCO Host Mobile which provides access to articles from EBSCO databases via Web-enabled mobile devices. However, although tested on several mobile devices by the company itself, no usability test has previously been done to see if Irish students find such a service usable.

In this study, the author attempts to determine whether the information service provided by the EBSCO Host Mobile application provides a usable experience for its target audience. To accomplish this, a usability test consisting of five tasks was designed. This was completed by a sample of the application’s target audience: third level students. Insight gained from such a study will be useful for improving this application in particular, and, more generally, for raising awareness among academic librarians that such library services exist for Web-enabled handheld device users.

1.2 Significance of the Study

Libraries are increasingly turning to the Mobile Web to offer new services to their patrons. They are using smartphones and iPods to deliver information services in a new way. Kroski (2008b) found that, in the United States, academic libraries have begun to introduce the following innovations: MOPACS (Mobile
Online Public Access Catalogues), subject guides viewable in mobile format, search functionality for e-book titles and library websites that are specifically constructed for access via Web-enabled mobile devices. Kendall et al. (2010) investigated the growth in the use of university libraries of specific iPhone apps; they predict this area will grow rapidly. It has long been accepted that usability testing is an important tool for evaluating the effectiveness and ease of use of academic library websites (Battleson et al., 2001). Kaikkonen et al. (2005) found that usability testing a mobile application in a controlled laboratory seems to be sufficient when studying user interface and navigation issues. This research is important, as it is the first usability test of an academic database system designed for mobile access using Irish students. This study will be of interest to researchers interested in how Irish academic libraries can begin to provide some of these mobile services. It will be useful for systems librarians in helping them ascertain what content students want from mobile library websites and to see what is important to end users in terms of having a usable experience on their mobile device.

1.3 Purpose and Design of the Study

The primary concern of this research is to examine whether the library and information services that the EBSCO Host Mobile application provides are usable. Where problems exist with the usability of the application, suggestions are made as to ways of improving it. The methodology employed is usability testing. This is because usability testing is important in each stage of the design process and, even when the final design has been decided on, subtle usability problems can appear during implementation (Nielsen, 2003b). The usability study is made up of three sections: a pre-usability test questionnaire, a think out usability test and a post-usability test questionnaire.

1.4 Research Aims

The chief aim of this research is to evaluate the usability of accessing library and information services via EBSCO Host Mobile.
This aim can be subdivided into the following objectives:

1) To assess whether the application meets the usability attributes of learnability, navigation, efficiency, effectiveness and aesthetics.
2) To propose possible solutions to any usability problems encountered

This is assessed by studying users performing typical tasks with the application on an iPhone and determining if the functionality is appropriate and usable for the target audience. The tasks in the usability test assess users’ ability to:

1) Retrieve articles in PDF and HTML format
2) Email articles
3) Perform advanced searches
4) Perform multi-database searching
5) Search databases by image

The other aim of this study is to determine what value library services accessed via Web-enabled mobile devices have.

This aim can be subdivided into the following objectives:

1) To investigate what mobile services are available for libraries worldwide
2) To assess what provision of mobile services is provided for by Irish academic libraries
3) To suggest ways in which Irish academic library services can be improved

1.5 Limitations

According to the EBSCO Support Website (2010), EBSCO Host Mobile was tested on several mobile devices. It has been quality certified on mobile phones such as the Android, BlackBerry, Dell Axim, Palm 750 and the iPhone. For the purposes of this limited study, the only mobile device used in the testing of EBSCO Host Mobile was the iPhone 3GS. Ideally, usability tests should take place in specifically designed usability labs. To ensure discreet observation, a
two-way mirror is used (Krug, 2005). This was not possible for this study, so a room was provided in the undergraduate and postgraduate libraries in Dublin Business School where the testing of users could take place. Another limitation of usability testing an application on a smartphone in a controlled environment is that mobile context, as well as unreliable connection of wireless networks are not tested (Zhang and Adipat, 2005). Norgaard and Hornbaek, (2006) argue that in an ideal situation, usability test evaluators should discuss with other evaluators the specific problems about which an evaluator is unsure, as well as having the data analysed by different evaluators. This was not practical for the purposes of this study. Ideally, usability testing should be repeated throughout each stage of the design and alterations to the product made accordingly (Nielsen, 2003b). This test only tested the final version of the application, and only one series of tests was carried out.
Chapter 2- Literature Review

This chapter reviews the principles and core concepts behind usability, usability testing and the Mobile Web. There is also a review of recent innovations in libraries, such as services offered through mobile technologies.

2.1 Usability

Usability is a multi-dimensional concept, having a number of definitions. The International Organization for Standardization (1998) defines usability as “the extent to which the product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use”. In the same publication, usability attributes are defined as follows:

“Effectiveness: The accuracy and completeness with which users achieve specified goals.
Efficiency: The resources expended in relation to the accuracy and completeness with which users achieve goals.
Satisfaction: Freedom from discomfort, and positive attitude to the use of the product.
Context of use: Users, tasks, equipment and the physical and social environments in which a product is used”.

Nielsen (2003b) states that usability can be boiled down to five core components:

“Learnability: How easy is it for users to accomplish basic tasks the first time they encounter the design?
Efficiency: Once users have learned the design, how quickly can they perform tasks?
Memorability: When users return to the design after a period of not using it, how easily can they reestablish proficiency?
Errors: How many errors do users make, how severe are these errors, and how easily can they recover from the errors?
Satisfaction: How pleasant is it to use the design?”

Krug (2005) outlines what usability means in simple terms. He believes that usability simply entails ensuring that something works well and that a person of average ability and experience can use the product without getting frustrated. Abran et al. (2003) have outlined effectiveness, satisfaction and learnability as ways of defining usability attributes while Tsakonas and Papatheodorou (2006) propose learnability, ease of use, navigation and aesthetic appearance as usability attributes that can aid its measurement. It was decided that, for the purpose of this limited study, five usability attributes would be selected that best exemplify what is to be tested.

The five attributes chosen are learnability, navigation, efficiency, effectiveness and aesthetics. Learnability was outlined by all major researchers in this field as being one of the chief attributes and appeared an obvious choice for inclusion. If users are able to use this application and learn how to use its interface, despite having never used it before, this would give a strong indication that the application is usable. Navigation was also chosen as a usability attribute. This is because users must be able to traverse the interface performing tasks and without fear of losing their way. This is to be measured by evaluating participants’ navigating from both task to task, as well as navigating within tasks as instructed. The International Organization for Standardization (1998), as well as Nielsen (2003b), place an emphasis on efficiency. As well as determining if participants could successfully complete the tasks, it would be useful to know how long it took them and what errors they spent time on. Nielsen (2003b) also outlines “error” as a usability attribute. By this he means how easily they can recover from their errors. The efficiency attribute for the purposes of this usability test encompasses the criteria for Nielsen’s error attribute also. Effectiveness measures the accuracy and effectiveness with which users complete tasks, so seemed a natural criteria for judging this particular usability test. Aesthetics measures how pleasant the application appears in terms of its design. Nielsen (2003b) refers to this as the “satisfaction” attribute. Users are more likely to return to a system, if the aesthetics are pleasant. These attributes are described in more detail below.
2.1.1 Five Attributes of Usability

Learnability

Nielsen (2003b) defines learnability as “How easy is it for users to accomplish basic tasks the first time they encounter the design?” This is surely the most fundamental part of usability. If the system enables users to be comfortable in using the system right away, it is considered to be strong in learnability (Seffah et al., 2006). Blandford and Buchanan (2003) believe learnability is simply how easily users can learn to use the system.

Navigation

Navigation refers to the ease with which the user can use the navigation tools to traverse the interface and how aware they are of their current location (Buchanan and Salako, 2009). Nielsen and Loranger (2006) stress that a consistent navigational structure is a fundamental concept in navigation and that good navigation should be predictable and make people feel comfortable exploring the site without fear of losing their way.

Efficiency

The International Organization for Standardization (1994) defines the efficiency attribute as “the resources expended in relation to the accuracy and completeness with which users achieve goals”. Task completion time is the primary way of measuring efficiency. However, Abran et al. (2003) argue that time spent on errors, the error percentage and number of available commands not called upon, are all relevant when taking efficiency into account.

Effectiveness

Effectiveness is concerned with task completion in relation to user goals, in particular success rates (Buchanan and Salako, 2009). Frokjaer et al. (2000)
argue that efficiency and effectiveness should be considered independent parts of usability. Efficiency is related to the effort required, while effectiveness is to do with the outcome. The International Organization for Standardization (1994) defines effectiveness as “the accuracy and completeness with which users achieve specified goals”.

**Aesthetics**

Besides performance, another design attribute that can affect usability is aesthetics. Ben Bassat *et al.* (2006) make the case that that aesthetics is “a strong determinant of the pleasure the user experiences during the interaction”. In tests they performed, users did not necessarily prefer the system that allowed them to reach the highest level of performance, but also considered aesthetics. Thuring and Mahlke (2007) found that user satisfaction is likely to be influenced by factors such as “personal experience with technology, preferred working style and the aesthetics of system design”. In their study they found an influence of aesthetics on quality perceptions on the overall appraisal of the system.

**2.2 Usability Testing**

Usability testing has been defined as “any of those techniques in which users interact systematically with a product or system under controlled conditions, to perform a goal-oriented task in an applied scenario, and some behavioural data are collected” (Wichansky, 2000). Usability testing began in the nineteen-eighties. Initially, it was a quite expensive proposition, requiring a usability lab with an observation room behind a one-way mirror and at least two video cameras (Krug, 2005). Both Krug (2005) and Nielsen (1993) acknowledge that, if funds are available to hire a usability professional, it may make sense to incur the extra cost. However, the costs of hiring usability professionals are usually prohibitive. Coupled with this, industry jargon and elaborate laboratory setups used by usability professionals can intimidate users in a test situation. Discount usability testing began to develop in the late nineteen-eighties as useful results began to be achieved without expensive usability labs (Nielsen, 1993).
2.2.1 Number of Users to be Tested

Krug (2005) argues that, in most cases, the ideal number for each round of testing is three, or at most four. This is because the first three users are likely to encounter all of the most significant problems in each stage of development. The same author outlines how usability testing with three or four users enables product developers to alter their design after problems are observed. Testing should take place after each part of the design is complete. Nielsen (2000) maintains that elaborate usability tests are a waste of time and that the best results come from testing no more than five users. In the same paper, Nielsen argues that when you ask more users you learn less and less as the same problems keep appearing.

2.2.2 Think Out Loud Usability Testing

This technique can be performed by usability specialists in a usability laboratory or in the field. A small number of users think out loud while solving tasks with the system being tested and an evaluator observes the users (Hertzum and Jacobsen, 2003). Nielsen (2003a) notes that “traditionally, thinking aloud studies are conducted with psychologists or user interface experts as experimenters who videotape the subjects and perform detailed protocol analysis”. He believes that, instead of this possibly intimidatory approach, it may be better simply to perform a few user tests while encouraging the user to think out loud as they perform them. This approach, where we can hear the user’s thoughts, allows us to know why they do what they do. Nielsen and Loranger (2006) argue it is “far more important to know why a user clicked the wrong button than just observing that they did”.

2.2.3 Other Practicalities of Usability Testing

A factor to be considered after it is determined how many users will take the test is what type of users are required. Nielsen (1993) argues that selecting participants who are representative of the targeted users improves the validity of
the study. Krug (2005) maintains that in usability testing systems, it doesn’t matter much who you test. He qualifies this by saying that if the website is to be used almost exclusively by one type of user, then a sample of this group should be tested.

In regards to where the test is to take place, Krug (2005) makes the case for any office or conference room as long as it has two chairs, a computer and a video camera. The equipment used as part of the test should be as similar as possible to what will be used in the real world in order to ensure that the tests are realistic (Nielsen and Loranger, 2006). Krug (2005) makes the point that when the website is “live”, two types of testing can take place. “Get it” testing is when the user is shown the site and asked for initial impressions and if they understand how it works, what its purpose is etc. “Key task testing” is when the user is given a series of tasks to complete and the observer sees how well they do.

2.3 The Mobile Web

The Mobile Web can be defined as the World Wide Web accessed from a mobile device. It includes the entirety of the Web and is not restricted to websites that are specifically designed for mobile viewing (Kroski, 2008b). These mobile websites are designed for the small screen of the mobile device. They are generally stripped-down versions of the main website. This is to allow for the smaller screen size (Murray, 2010). The main benefit of Web-enabled mobile devices is that it allows the user access to the internet on the move. They are also Global Positioning System (GPS) enabled and feature interactive capabilities such as allowing users to create content and share it on social networking sites (Kroski, 2008a).

The emergence of the Mobile Web offers a hitherto unprecedented level of flexibility and convenience in communicating from virtually anywhere. The unique features of mobile devices present challenges for information retrieval purposes (Zhang, 2007). Some of the challenges that mobile users face on mobile devices are that mobile connections are slow by desktop standards, and, even on spacious handhelds like the iPhone, screens are small (Wisniewski, 2010).
Perhaps what differentiates the Mobile Web from the desktop is that mobile users require information that is useful to a person in motion. Additional information needs to be pared down to essentials as the World Wide Web Consortium (2008) explains: “Mobile users … are likely to have more immediate and goal-directed intentions than desktop Web users. Their intentions are often to find out specific pieces of information that are relevant to their context”.

### 2.3.1 Smartphones

Smartphones have been described as mobile telephones “with built-in applications and internet access. Smartphones provide…any combination of text messaging, e-mail, Web browsing…In addition to their built-in functions, smartphones have become application delivery platforms, turning the once single-minded cell phone into a mobile computer” (PC Magazine, 2008). These phones supply the tools to enable users to interact with their environments (Ballagas et al., 2006). The most recent data shows that sales for the whole smartphone market are rising at the highest level since 2006, and that for the first quarter of 2010, Android, Apple and Blackberry were the leading smartphone providers (Cellan-Jones, 2010).

As the smartphone market continues to expand, Wisniewski (2010) argues it makes sense to develop mobile specific versions for library websites. He believes it is best to serve existing content from websites that are reformatted and optimised for mobile device users. Mobile phone users on older phones with smaller screens and slower connections would still get a usable experience. However, designed correctly, one site can provide a usable Web experience to all mobile phone users, but still deliver an optimised service for users of smartphones.

**The iPhone**

The iPhone is an internet-enabled smartphone developed by Apple. It was first made available in 2007. Its capabilities include the ability to play music, navigate the Web, play movies, make calls and text message, among other functionalities
(Silverman, 2007). Later versions include the iPhone 3G and iPhone 3GS with increased capability. The main method of user interaction is the touchscreen which is used as a virtual onscreen keyboard (Mossberg, 2008). According to research carried out before the launch of the iPhone by Vodafone in March 2010, the number of iPhones currently in circulation in Ireland adds up to 250,000 devices (Kennedy, 2010).

Smartphones like the iPhone have potentially enormous advantages in relation to higher education. Mobile devices have been described as the “most promising and ever-expanding method by which to deliver content” (Wagner, 2008) and having “nearly infinite possibilities for education, networking, and personal productivity on the go” (Johnson et al., 2009). The Web-enabled smartphone can help to provide a powerful and mobile experience for the contemporary classroom. Perkins and Saltzman (2010) report on the Abilene Christian University’s initiative giving each student entering the college an iPhone or iPod Touch. This initiative was to incorporate these emerging technologies into higher education. They found that 89% of students and 87% of faculty members rated the program as a success. Their research discovered that “iPhones present an attractive platform for learning and that learning activities can be successfully transitioned to mobile-device platforms”. It is likely that Web-enabled mobile devices will be used extensively in supporting higher education in years to come.

2.3.2 Usability Testing the Mobile Web

The World Wide Web Consortium (2006) defines three aspects of mobile usability: site, device and browser. Site measures the effectiveness of the mobile website; device pertains “to the capability of the equipment being used easily and effectively”, while browser defines “the ease of using a browser effectively to perform the three functions of reading, navigating and interacting”.

There are a number of problems in usability testing mobile applications where accessing the internet. It is extremely difficult to include aspects of mobile context such as location, environmental elements and wireless connectivity differences in a single usability test (Longoria, 2001). Small screen size also
creates problems in usability testing. Common to all touch screen devices, mobile devices accessing the internet share the “fat finger” problem which makes it difficult for users to accurately hit small targets in a test environment (Nielsen, 2009).

Kim et al. (2002) argue that in an ideal scenario, usability testing of mobile applications should cover all, or most possible situations of a mobile environment. This would entail field testing of mobile devices as opposed to testing in a laboratory. However, Zhang and Adipat (2005) argue that performing field tests through usability studies presents a number of problems. These include:

1) It is not easy to apply established evaluation techniques such as observation
2) It is difficult to collect data and control conditions as users are moving around
3) It can be complicated to establish realistic environments that capture the richness of the mobile context

Kaikkonen et al. (2005) found that usability testing a mobile application in the laboratory seems to be sufficient when studying user interface and navigation issues. The authors tested the usability of a mobile application in both a laboratory and in a field with a total of 40 test users. They found the same problems in both environments. The results found suggest that conducting a time-consuming field test might not be worthwhile when testers are searching for user interface problems.

2.4 Library Services Via Mobile Technology

Libraries are increasingly turning to the Mobile Web to offer new services to patrons. They are using the technology that their patrons are using, such as smartphones and iPods, to deliver services in a new way. There are a number of specific ways in which they do this. These include: mobile websites and mobile OPACs, mobile collections, library apps and databases for mobile devices. They
are described below.

2.4.1 Mobile Websites and Mobile OPACs

A growing number of libraries are now creating mobile versions of their websites for their patrons to access from their mobile devices. Information about library services, collections as well as library hours are specifically formatted for the small screen (Kroski, 2008b). Kroski investigated a number of academic libraries’ mobile websites. She found that Ball State University Libraries has made available a catalogue search, journal search and the facility to see videos about the library to its Mobile device using patrons. She also researched the University of Virginia Libraries' mobile website. This site contains directions, library hours and a text-only version of the desktop website. Murray (2010) maintains that it is important to display the most vital information on the mobile version of a library website such as library hours, OPAC, checkout services and library news or events. Krosky (2008b) explains the rise of MOPACS (Mobile Online Public Access Catalogues). Through this service, patrons can retrieve information about checked-out items, due dates and fines. They can also search the catalogue and renew items from their mobile device.

2.4.2 Mobile Collections

Libraries are increasingly offering their patrons digital media collections that enable them to benefit from library services remotely. Kroski (2008b) found that public libraries in America are offering audiobooks preloaded on lendable iPods and also loading titles on to patrons’ own iPods for the standard loan duration. Murray (2010) suggests that as a mobile version of Google books is available to smartphone users, libraries could link their OPACs to this service and allow mobile devices to access these versions which are specifically designed for small screen reading. Furthermore, she outlines how mobile collections can include reference materials specifically designed with a mobile-friendly design such as the ‘World Book’ and ‘World Almanac’ as well as dictionaries and thesauri.
2.4.3 Library Apps

Another option for libraries to make content available via mobile devices is to create their own downloadable apps. Although library-specific apps are few in number at the moment, their popularity is expected to mushroom (Kendall et al., 2010). The same authors review several apps such as the District of Columbia Public Library where users can search the catalogue, place holds, check hours, and find phone numbers. They also note how the iPhone apps for several universities such as Stanford and Duke Universities are engaging and user-friendly. Hadro (2010) notes some developments in library-specific apps such as BookMyne, an iPhone app that geolocates libraries. Once the app has located a participating library, it connects patrons to a mobile OPAC.

2.4.4 Databases for Mobile Devices.

According to Fox (2008), several library databases are making their content mobile-accessible. They include a newspaper service called ‘Pressreader’, as well as the Epocrates health and medical service which has a special interface for iPhone users. She argues that in making collection development decisions, librarians need to consider mobile accessibility as possible selection criteria. Kroski (2008b) describes further mobile innovation that is pertinent to academic libraries. She notes that academic software and database providers have begun to see the importance of portability in regard to their services. The scholarly citation management application, Endnote, has now got mobile functionality. The Westlaw legal research database can now be searched from a mobile and the National Library of Medicine can be searched via a mobile device.

**EBSCO Host Desktop Version**

EBSCO is an information service which provides e-journal, e-book and full text databases for all types of libraries. EBSCO Host provides access to more than three hundred full text and secondary databases (EBSCOhost, 2010). According to the same source, EBSCO is the most used reference source in the world. In 2008, EBSCO introduced its new search interface for its desktop version. The
basic search screen, as seen in Fig. 1, provides a simplified search interface similar to that of Google.

Fig. 1 Basic Search Screen of Desktop Version of EBSCO

This basic search screen has been praised for combining a Google like basic search interface with advanced features automatically built into the results page (Badke, 2008). Users can refine their search with limiters provided once the results page comes up. The same author comments that the new interface “encourages more sophisticated searching and makes such searching possible by putting the more advanced options right in the patron's face”. Fig. 2 illustrates a
results page in basic search mode, with the automatic option to limit results by full text, references available, peer reviewed or date on the right hand side.

Fig. 2 Results Page in Basic Search in Desktop Version of EBSCO

Innovations of the new interface of the EBSCO desktop version have been outlined by Brisco (2008). They include the following:

1) Mouse-over previews of article contents within results list
2) Ability to search for words, phrases or even complete paragraphs
3) Ability to bookmark results using Web 2.0 Bookmarking sites
4) Magnifying glass icon to provide preview of article’s citation
5) Personalised folders to store articles

Advanced search options allow users to limit searches using Boolean operators or a new service called “SmartText” which allows users to copy and paste segments of text to search for results. Users can also search by image. A screenshot of the advanced search is provided in Fig. 3.

![Advanced Search Options in Desktop Version of EBSCO][2]

Fig. 3 Advanced Search Options in Desktop Version of EBSCO
EBSCO Host Mobile

In 2009, EBSCO Host Mobile was released. This allows researchers to access EBSCO databases via smartphones and other Web-enabled handheld devices. The single search box look of the basic search is similar to that of the desktop version, and it is similar to search interfaces that users expected to be familiar with, such as Google. Fig. 4 illustrates this. Advanced search functionality is also offered. Many of the existing EBSCO Host advanced search features such as limiting to: full text, date ranges, peer-reviewed content or by publication are available. The service also allows users to read articles on their devices as HTML or PDF and to email articles as an attachment (Free, 2009). Fig. 5 illustrates the advanced search page.

Fig. 4 Basic Search with Single Search Box
This service provides a convenient way for users using Web-enabled mobile devices to perform their research. The homepage offers a number of options including choosing which database(s) to search, as well as setting search options. Fig 6 illustrates the database selection page. The result list is scrollable and available data include citations, image quick view and access to full-text articles. Users are able to email results (Library Hi Tech News, 2010). The “image quick
view” option allows pertinent thumbnail images such as charts, photos, maps and illustrations to be added to result list items. Full-sized images can be viewed by clicking on any thumbnail image in the results list without even opening the article first (EBSCO Image Quick View, 2010). Library Hi Tech News (2010) report that clicking into a result “replicates the EBSCO Host user experience, providing researchers with information including author information/affiliation, links to the source, document type, … along with the abstract, ISSN, Accession Number, persistent links, images, links to full text, etc”.

Users can search by “publication” just as in the desktop version.

Users can also email ten search results to themselves, though users cannot choose which results to send. An article retrieved provides an “envelope” icon to send the article. Fig. 7 illustrates this functionality. The desktop version provides a spell checker which automatically checks for commonly misspelled words. This facility is not provided in the mobile version (Price, 2010). The interface has been simplified from the desktop version by removing folders and some other
more advanced features for increased speed. The “text-to-speech” option, which enabled users to have text read out to them, is not available in the mobile version. Personalised folders, used to store saved material, are also not included. Another feature missing from the desktop version is when searching in the basic search mode, no automatic search limiters are provided in the results page.

In conclusion, the mobile version of EBSCO Host is a streamlined version of the desktop version. This Mobile Web optimised version is limited compared to the EBSCO Host desktop electronic journals service. It is designed for users who are on the move and who want “a quick look to see if research is available that will support their information needs” (Aldrich, 2010).

Fig. 7 Article with Email Option Highlighted in Red
Chapter 3-Methodology

The methodology chosen was usability testing. The usability test was made up of three sections: a pre-usability test questionnaire, a think out loud usability test and a post-usability test questionnaire. Kaikkonen et al. (2005) argue that usability testing a mobile application in the laboratory appears to be sufficient when studying user interface and navigation issues. For this reason, the usability test was carried out in a single location.

3.1 Research Location

The location where the usability tests were carried out was Dublin Business School Library. Dublin Business School is the largest independent third level institution in Ireland and provides a comprehensive range of undergraduate, graduate, professional and executive education programmes. The Library Service at Dublin Business School comprises the Undergraduate Library and Postgraduate Library at Aungier Street and Dame Street respectively. The combined Library collection contains over 50,000 books and 205 print journals from subjects ranging from life sciences, business, law and the arts. The Library has an e-book collection and provides access to approximately 45,000 e-journals. The Library also subscribes to an extensive portfolio of online databases, all of which are available off campus. In the academic year of 2009/2010, its library service introduced the EBSCO host mobile service for students. This enabled access to a number of databases for the college’s students and thus proved a suitable place to evaluate its usability.

3.2 Participant Selection

As already referenced, Nielsen (1993) argues that selecting participants who are representative of the targeted users improves the validity of the study while Krug (2005) believes that if a system to be used almost exclusively by one type of user, then a sample of this group should be tested. For this reason, all of the participants in this usability study were students of Dublin Business School.
In order to reflect student demographics in the college as accurately as possible, it was decided that three undergraduates, two postgraduates and one part-time student would participate in the usability tests. Students were approached at random over a period of two days and asked if they wished to participate in the usability tests. Usability tests were conducted once the quotas of undergraduate, postgraduate and part-time students had been met.

3.3 Usability Study Design

A usability test script was read by participants at the start of the usability test. This explained how the process would work (available in Appendix A). A video recording release form was read and signed by participants. This was to give permission to the facilitator to video record the tasks (available in Appendix B). The usability testing was divided into three segments. First, a pre-usability questionnaire was given to participants. This was designed to determine their methods of online academic research, prior experience with Web-enabled mobile devices and what library services they would like to see available via mobile devices. Next, a “think out loud” usability test was conducted where five tasks were allocated to participants. Participants were encouraged to say exactly what they were thinking as they attempted that task. Finally, a post-usability test was administered to find out what participants felt about the application and any potential changes they would make to it.

3.3.1 Pre-Usability Test Questionnaire
(Available in Appendix C)

**Question one** was to determine whether the participant was an undergraduate, postgraduate or a part-time student. As already described, this was to confirm the demographic split which was three undergraduate, two undergraduate and one part-time student. Questions two and three dealt with the way students conduct online academic research. **Question two** sought to find out search engine or databases students usually used to find articles pertinent to their research. **Question three** sought to specify what databases, available via the college website, participants generally used to conduct research. Questions four to six
asked participants about their use of advanced searches. **Question four** sought to ascertain whether they performed advanced searches such as limiting results by author, year etc. **Question five** asked whether they performed multi-database searches, while question six dealt with whether they ever emailed retrieved articles to themselves. **Question seven** examined awareness of this application amongst participants. **Question eight** sought to find out what other features they would like to be made accessible via mobile devices. The final questions dealt with experiences of participants with smartphones. **Question nine** asked whether participants owned, or ever used a smartphone or iPod. **Question ten** asked if they had ever used one of these devices to conduct academic research.

### 3.3.2 Think Out Loud Usability Test

Krug (2005) argues that, when the website, or application in this case, is “live”, two types of testing can be performed. “Get it” testing involves showing the user the site and asking for initial impressions. “Key task” testing involves giving the user a series of tasks to complete and assessing their success. For the “get it” testing, participants were asked to access [http://m.ebscohost.com](http://m.ebscohost.com) and log in. Their student number served as both username and password. They were then asked to comment on their initial impressions of the site. This helped the facilitator to assess the usability of the application using the aesthetics criteria.

The key-task testing involved five separate tasks that were chosen to test all of the major functionalities offered by the application. The tests started off with a relatively simple task and gradually increased in difficulty. After each task, participants were asked the question “How easy or difficult was it to complete the task?”

**Task 1**

Task 1 was to ascertain the usability of the basic search using one specific database.

**Instructions:** Go to the Business Source Complete database and do a search for “internal audit”. Download any article you find in PDF format.
Task 2
This task was to determine if the multi-database functionality was easy to use. It was also designed to see if users could retrieve an article in a format other than PDF.

Instructions: Highlight the databases PEP Archive and Psyc ARTICLES and do a search for “narcissism”. Download an article you find in HTML Full Text format.

Task 3
This task was to ascertain if the user could successfully use the interface to retrieve an article and send that article to an email address.

Instructions: Go to the Library, Information Science & Technology Abstracts with full text database and perform a search for “mobiles and libraries”. Send an article you find to your email address.

Task 4
This task was more difficult and it required the user to use the advanced search functionality. This task was designed to determine how easy it was for users to narrowly restrict their search. This task also helped to assess how usable the navigation was in the interface.

Instructions: Go to the GreenFILE database. Using the advanced search options, find a peer-reviewed, full text article from between 2009 and 2010 about “renewable energy”.

Task 5
This task was to test the feature in EBSCO Host Mobile that allows users to search for articles in a database by image.

Instructions: Go to Business Source Complete and find an article that contains an image using the search term “investing in commodities”.

3.3.3 Post-Usability Test Questionnaire
(Available in Appendix D)

The post-task questionnaire consisted of ten open-ended questions. The first
section dealt with what the participant thought of the application. **Question one** asked participants their overall impressions of the application. **Question two** asked them to grade the application from A-F. **Question three and question four** asked participants to list the features they liked best and least respectively. **Question five** sought to find out whether they believed they had successfully completed all of the tasks they had been given. The next section of the post-usability questionnaire was to give the participants a chance to provide an input into alterations they would make to the application. **Question six** asked what change to the application they would make if they could make one significant alteration. **Question seven** asked participants whether they would like to see any extra options added to the application. The final section of the post-usability questionnaire dealt with what the student planned to do with the application in the future. **Question eight** asked whether they would return to the application of their own accord in the future and asked them the reasons for their choice. **Question nine** asked participants whether they would recommend this application to a fellow student and why. Finally, **question ten** asked participants if they had any questions or queries about the application.

### 3.4 Usability Study Practicalities

Permission to involve students from Dublin Business School was sought and received from the library manager. As previously outlined, Krug (2005) makes the case for the use of any office as usability lab, as long as it has two chairs, a computer and a video camera. A group study room was booked in both the undergraduate and postgraduate libraries for the duration of the usability tests. According to Nielsen and Loranger (2006), the equipment used as part of the test should be as similar as possible to what would be used in the real world to ensure that the tests are realistic. The iPhone 3GS is one of the Web-enabled devices that can access EBSCO Host Mobile and is a hugely popular smartphone in Ireland (Kennedy, 2010). A digital camera was used to record both the “think out loud” usability tests and the post-usability test. Students in the two libraries were asked to volunteer to test the application. The breakdown of three undergraduate, two postgraduate and one part-time student was achieved. The application was explained and participants were informed that they should “think out loud”.

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Participants were told that the usability tests were going to be videoed and they were asked to sign a video recording release form.

3.5 Transcription of Notes and Analysis

The usability tests themselves were videoed and they were later transcribed. The quotations of participants and descriptions of their physical activity in attempting the tasks were differentiated by different coloured fonts: quotations in black and physical description in red. Both the quotations and physical descriptions were transcribed consecutively. This was so a link could be made between what they were thinking and the action they took.

NVivo is a qualitative data software package. It helps researchers to classify, sort and arrange data, so information can be analysed and insight can be gained (QSR International, 2008a). The transcriptions of P1-P6 were added individually to the “internal sources” folder. Once selected, it was possible to read the entire transcript of a participant’s usability test. Fig. 8 shows the early stages of Task 1 for P1.
Once transcriptions were imported, they were ready to be coded. In NVivo, data is coded by topic. Similar data can be gathered together in containers that may be easily retrieved. These containers for references to this material are called “nodes”. As data was to be classified using a hierarchical structure, “tree nodes” were used. These are nodes that “are catalogued in a hierarchical structure, moving from a general category at the top (the parent node) to more specific
categories (child nodes) “nodes”” (QSR International, 2008b). Fig. 9 illustrates this hierarchical structure.

Fig. 9 Hierarchical Structure of Tree Nodes

Three of the five usability attributes discussed earlier were used in the analysis of each test. Each of the “key task” tests were given the following nodes:

1) Problems
2) Effectiveness
3) Efficiency
4) Navigation
5) Difficulty of Task

1) **Problems:** This node grouped the problems experienced by participants in completing each task together.

2) **Effectiveness:** This node highlighted the parts of the transcription of participants’ quotations and description of their physical actions which showed how effectively they completed each task. The International Organization for Standardization (1994) define effectiveness as “the accuracy and completeness with which users achieve specified goals”. These two criteria were used when coding this node.

3) **Efficiency:** This node grouped together instances in the transcription which showed how efficient or otherwise participants were in each task. Task completion time was the chief way of measuring efficiency in the tasks. However, Abran *et al.* (2003) argue that time spent on errors, the error percentage and number of available commands not called upon, are all relevant when taking efficiency into account. These criteria were also taken into account.

4) **Navigation:** The navigation node isolated instances which showed how participants navigated around the application. This node measured the ease with which users used the navigation tools to traverse the interface.

5) **Difficulty of Task:** This node grouped together the answers given by participants to this question which followed each task: “How easy or difficult was it to complete the task?”

Once the nodes were assigned to each task, they were ready to be filled with relevant content. The transcription for each participant was located in the “sources” folder and opened. When relevant content was located for a node, it was highlighted and dragged over to that node. Fig. 10 illustrates a passage from P1 which was highlighted and copied over to the “Difficulty of Task” node, which is highlighted on the left hand side. When coding was complete for this node, it could be selected using the Tree Nodes option. Fig. 11 shows the results for participants’ opinions on how difficult Task 1 was. Coding in this manner allowed easy and convenient retrieval of data, which made the transcribed
material far easier to analyse.

Fig. 10 Selecting Text for Coding
Fig. 11 Coding for Difficulty of Task for Task 1 Using NVivo
Chapter 4: Results

The results are reported in the following order: the pre-usability test questionnaire, the think out loud usability test and the post-usability test questionnaire. As the participants are anonymous, each of them was allocated an identifier (P1-P6) so they could be referenced.

4.1 Pre-Usability Test Questionnaire Results

4.1.1 Student Type Breakdown of Participants

Question one was to find out what type of student was participating in each test. As already described, this was to confirm the demographic split which was three undergraduates, two postgraduates and one part-time student. The breakdown is illustrated in Table 1.

Table 1-Student Type Breakdown of Participants

<table>
<thead>
<tr>
<th>Student Type</th>
<th>No. of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate</td>
<td>3</td>
</tr>
<tr>
<td>Postgraduate</td>
<td>2</td>
</tr>
<tr>
<td>Part-Time</td>
<td>1</td>
</tr>
</tbody>
</table>

P1, P2 and P6 are undergraduates. P3 is a part-time student. P4 and P5 are postgraduates.

4.1.2 How Participants Conduct Online Academic Research

Questions two and three dealt with the way students conduct online academic research. For both questions, participants were free to select more than one option. They were first asked what search engine, database or other system they use in searching for academic material and given a list of options. Table 2 illustrates the results. Five out of the six participants use Google, with five of these also using WebFeat (library databases). The participant who does not use
Google uses the library catalogue. No participant uses the Yahoo search engine or Google Scholar. They were then asked which databases available from the Dublin Business School Library website they use. The results of this question are illustrated in Table 3. Business Source Complete and Academic Search Complete are the two most popular databases with four and three participants respectively using them. Two of the participants use the Emerald database, while one participant uses Regional Business News. None of the other databases offered as options are used by participants.

Table 2-Search Engines/Databases/Other Systems Used

<table>
<thead>
<tr>
<th>Search Engine/Database Used</th>
<th>No. of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Google</td>
<td>5</td>
</tr>
<tr>
<td>Yahoo</td>
<td>0</td>
</tr>
<tr>
<td>Google Scholar</td>
<td>0</td>
</tr>
<tr>
<td>WebFeat (library databases)</td>
<td>5</td>
</tr>
<tr>
<td>Library Catalogue</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
</tr>
</tbody>
</table>
Table 3-Databases Used From Library Website

<table>
<thead>
<tr>
<th>Databases Used</th>
<th>No. of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Search Complete</td>
<td>3</td>
</tr>
<tr>
<td>Business Source Complete</td>
<td>4</td>
</tr>
<tr>
<td>Computers &amp; Applied Sciences Complete</td>
<td>0</td>
</tr>
<tr>
<td>Emerald</td>
<td>2</td>
</tr>
<tr>
<td>Film and Television Literature Index</td>
<td>0</td>
</tr>
<tr>
<td>GreenFile</td>
<td>0</td>
</tr>
<tr>
<td>Hospitality &amp; Tourism Complete</td>
<td>0</td>
</tr>
<tr>
<td>Library, Information Science &amp; Technology</td>
<td>0</td>
</tr>
<tr>
<td>PEP Archive</td>
<td>0</td>
</tr>
<tr>
<td>PsycARTICLES</td>
<td>0</td>
</tr>
<tr>
<td>Regional Business News</td>
<td>1</td>
</tr>
</tbody>
</table>

4.1.3 Use of Advanced Searches

Questions four to six asked participants about their use of advanced searches. Question four sought to ascertain whether they performed advanced searches such as limiting results by author, year etc. Question five asked whether they performed multi-database searches while question six dealt with whether they ever emailed retrieved articles to themselves.

Three of the participants said they performed advanced searches, while three said they did not. Five of the participants said they never perform multi-database searches, with only one participant saying that they did. Five of the participants said they have never emailed retrieved articles to themselves. One participant
said that they had. The results are summarised in Table 4.

Table 4-Use of Advanced Searches

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perform Advanced Searches</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Perform Multi-Database Searches</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Email Articles To Yourself</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>

4.1.4 The Library and Mobile Services

The first question in this section sought to find out if participants were aware that the Dublin Business School Library provided access to this service. None of the participants were aware of the EBSCO Host Mobile application.

The next question sought to find out what other library features they would like to be made accessible via mobile devices. This data is illustrated in Table 5.

Table 5-Other Library Features That Should Be Made Accessible By Mobiles

<table>
<thead>
<tr>
<th>Catalogue</th>
<th>Timetable</th>
<th>Reading List</th>
<th>PC Bookings</th>
<th>Room Bookings</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>6</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>0</td>
</tr>
</tbody>
</table>
4.1.5 Previous Use of Smartphones

The final two questions of the pre-usability test questionnaire sought to ascertain participants’ use of smartphones. Question nine asked did they own or ever use a smartphone or Web-enabled mobile device. Question ten asked whether they ever used a mobile phone/device to conduct academic research. None of the six participants had used or owned a smartphone before but three had owned or used an iPod. Only one of the participants had used a mobile phone/device to conduct academic research.

4.2 Think Out Loud Usability Test Results

Firstly, participants had to give their initial thoughts on what they thought of the application, especially in terms of aesthetics. This was the “Get It” testing. The think out loud usability tests consisted of five separate tasks which attempted to test the major functionalities of the application. Participants were reminded to keep verbalising their thoughts throughout the tasks. Participants were read each task they had to perform. They could refer to the printed task instructions throughout the task.

4.2.1 “Get It” Testing Results

As soon as students had navigated to the EBSCO Host Mobile site and entered their student number as username and password, they were asked to comment on what their initial impressions of the site were. The initial reaction was positive. The general consensus was that the colours of the application looked well and that it was quite similar to the PC version. Comments made by the participants included:

“It seems ok yeah, I’m not used to searching databases though as am only a part-time student so we’ll see how I get on with it”. (P3)

“It looks fairly nice yeah, it’s kind of like the PC version”. (P4)

“It looks quite attractive. The colours look pretty good”. (P5)

“Yeah it looks quite nice. I like the colours. I’m used to touchscreens on my iPod, so it should be handy enough to scroll up and down and move around in it I’d say”. (P6)
These “get it” test results were transcribed for each participant and given a separate node. Fig. 12 illustrates this. The node for all six participants is available in Appendix E.

Fig. 12 “Get It” Testing Node in NVivo
4.3 “Key Task” Testing Results

4.3.1 Task 1

Task 1 was to ascertain the usability of the basic search using one specific database. Participants were asked to “go to the Business Source Complete database and do a search for ‘internal audit’. Download any article you find in PDF format”. Fig. 13 shows the part of the list of databases page where Business Source Complete was located. Participants scrolled down to this part of the page and clicked in to the database’s name. None of them used the grey box on the left to select the database.

![Fig. 13 Selecting Business Source Complete from List of Databases](image)

Fig. 13 shows how participants entered the search term, while Fig. 15 illustrates an article downloaded in PDF format.
Fig. 14 Performing a Search for “Internal Audit” in Business Source Complete

**Fig. 15 An Article Downloaded in PDF Format**
Task 1: Node Analysis

Each node is explained on P. 32.

A full transcript is available for the Task 1 nodes in Appendix F.

Problems Node: This node shows only P2 having any difficulty with this task. P2 mistakenly went into Business Source Complete Enhanced which was an option at the bottom of the screen. Fig. 16 illustrates this node.

Efficiency Node: All of the participants completed the task efficiently except for P2, who, as well as having problems entering the database, did not see the PDF icon and clicked directly into the article. P2 managed to download a PDF version of the article they selected there.

Effectiveness Node: All of the participants successfully managed to perform a search for “internal audit” in the database and open up a file in PDF format.

Navigation Node: In terms of navigation, all six of the participants went directly into Business Source Complete. They did not highlight the database individually and select continue.

Difficulty of Task Node: Participants were unanimous that this task was straightforward. Here is a selection of the comments:

“That was easy enough really”. (P1)

“That was easy enough. It downloaded quickly enough”. (P6)

“It was just a case of getting used to the interface”. (P3).
4.3.2 Task 2

This task was designed to see if the multi-database functionality was easy to perform. It was also designed to see if users could retrieve an article in a format other than PDF. Participants were told to highlight the databases PEP Archive and Psyc ARTICLES and do a search for “narcissism”. Fig. 17 shows the selection of the two databases, while Fig. 18 shows the search results with the download options. They then had to download an article that they found in HTML Full Text format. Fig. 19 shows an article downloaded in this format.
Fig. 17 Multi-Database Searching in Task 2

Fig. 18 Search Results with Download Options
Fig. 19 First Part of an Article Downloaded Using HTML Full Text Option

Task 2: Node Analysis

A full transcript is available for the Task 2 nodes in Appendix G.

Problems Node: Four out of the six participants experienced difficulties in completing this task. Their difficulties were all to do with the deselection and selection of databases. P2 selected three databases initially. P6 pressed the “new search” option, which automatically kept the database selected for the previous search.

Efficiency Node: How efficient participants were at this task was also affected by issues to do with selection of databases. Database selection errors and correcting them meant four of the participants were slower than they should have been. P2 also had an efficiency issue by clicking directly into the article and not
selecting the HTML full text option straightaway, meaning he had to go back to the previous page to complete the task. Fig. 20 shows part of this node.

**Effectiveness Node:** All of the participants except for P3 successfully completed the task.

**Navigation Node:** Four out of the six participants relied on the “back” button to get back to the list of databases page. The other two saw the “new search” option. Fig. 21 illustrates this with both options highlighted.

**Difficulty of Task Node:** Four of the participants felt the task was quite approachable. However three participants did have some reservations about the size of the icons on the touchscreen. This was a typical view:

“That was quite easy once I had got the right databases selected, but the buttons are very small, and it’s tricky to select the ones you need”. (P5)

A more negative view of the easiness of the task was provided by P6 who commented:

“It wasn’t as easy as it should be. When you press “new search”, it shouldn’t remember the previous databases selected. It should be a completely new search”.
Fig. 20 Part of the Efficiency Node for Task 2
4.3.3 Task 3

This task was to ascertain if the user could successfully use the interface to retrieve an article and send that article to an email address. Participants were directed to go to the Library, Information Science & Technology Abstracts with full text database and perform a search for “mobiles and libraries”. Fig. 22 illustrates this step. The next part of the task asked participants to send an article they found to an email address. Fig. 23 shows the envelope button highlighted on the left which, when pressed, brings the user to the “email article” page. This page is illustrated on the right hand side of Fig. 23.
Fig. 22 Performing a Search on a Single Database

Fig. 23 Steps in Emailing a Retrieved Article
Task 3: Node Analysis

A full transcript is available for the Task 3 nodes in Appendix H.

**Problems Node:** The main problem encountered in this task was emailing the retrieved article. Both P2 and P6 had trouble initially in working out what they should look for in order to email the article. P4 also had trouble in emailing the article, as they clicked into the PDF version of the article which does not contain an email option. Fig. 24 shows part of this node.

**Efficiency Node:** In terms of efficiency, P2 hit the search button without changing the original search term, forcing them to go back to the previous page. P2 and P6 scrolled around the screen for a while, before eventually seeing the envelope icon so they could send the email.

**Effectiveness Node:** Both P4 and P5 used the “New Search” option, but failed to deselect databases from a previous search and thus did not fully successfully complete the task.

**Navigation Node:** Participants did not have any significant difficulty in navigating the interface.

**Difficulty of Task Node:** Participants were again mostly in agreement that the task was fairly straightforward. Comments included:

- “That was handy enough actually. It was easy to figure out that that icon was the email one”. (P2)
- “That one was easy. I saw the email icon straight away”. (P3)
- “Slightly tricky, but once you play around with it, it’s ok”. (P4)

However, P6 claimed that it was not as easy as it should have been:

- “I didn’t see the email icon straightaway. Maybe they could have a link that says ‘email’”.


4.3.4 Task 4

Task 4 was designed to test the advanced search functionality. This task tested how easy it was for users to narrowly restrict their search. This task also helped to assess how usable navigation was in the interface. Participants were directed to go to the GreenFILE database and use the advanced search options to find a peer-reviewed, full text article from between 2009 and 2010 about “renewable
energy”. Both steps are illustrated in Fig. 25. On the left, the GreenFILE database has been selected. Once the “Search Options” button is pressed, it brings up the advanced search option, which is illustrated on the right. The search results page can be observed in Fig. 26.

Fig. 25 Advanced Search Functionality in EBSCO Host Mobile
Fig. 26 Search Results for Advanced Search

**Task 4: Node Analysis**

*A full transcript is available for the Task 4 nodes in Appendix I.*

**Problems Node:** Problems encountered in this task included typing in the publications field for the date range and search term itself (P3 and P5), as well as trouble selecting the correct database (P2).

**Efficiency Node:** In terms of efficiency, both P3 and P5 took longer than they should in completing this task, as both had issues in mistakenly using the publications field when this was not asked for. P2 found the selection of the required database difficult, as they found the icons too small. P2 commented “That’s very awkward to select the one I need”.

**Effectiveness Node:** All six participants managed to complete the advanced search and download an article.

**Navigation Node:** This time, P4 chose the “choose databases” option while the rest used the back button to return to a list of databases. All participants had no
problem in finding the “search options” option to begin their advanced searches. Fig. 27 shows these two options.

**Difficulty of Task Node:** All but one of the participants agreed that this task was straightforward. Comments included:

“Yeah that was easy enough. It downloaded quick enough”. (P1)

“It was easy enough once I knew I had to go into search options”. (P2)

“It wasn’t too bad considering I don’t normally do advanced searches”. (P5)
4.3.5 Task 5

This task was to test out the feature in EBSCO Host Mobile that allows users to search for articles in a database by image. Participants were instructed to go to Business Source Complete and find an article that contains an image using the search term “investing in commodities”. They had to press the “Images” tab on the top left of the screen which opens up the “Image Quick View Collection”. Both of these steps are illustrated in Fig. 28 and Fig. 29. Once the “search” button is pressed in Fig. 29, results can be observed in Fig. 30.

Fig. 28 Selecting Images Search Option
Fig. 29 Searching Database by Image
Task 5: Node Analysis

A full transcript is available for the Task 5 nodes in Appendix J.

Problems Node: The main problem in this task was participants not seeing the images tab and going directly into the text box to enter a search term. P5 looked for an images option in “search options” but couldn’t find it and failed to complete the task.

Efficiency Node: The efficiency node was difficult to code as three of the participants felt they completed the task as they had found an article with an image in it. P5, who had to give up on the task, initially tried to look for the images option in the “search options”. P6 looked in “search options” as well but found the images tab after this. P2 also didn’t see the images tab immediately,
but eventually found it. Fig. 31 shows part of this node.

**Effectiveness Node:** Only two of the six participants managed to search the database by image. The International Organization for Standardization (1994) defines effectiveness as “the accuracy and completeness with which users achieve specified goals”. These two criteria were used when coding this node. Only two of the participants met both these criteria.

**Navigation Node:** Participants had no problem in traversing the interface for this task but all but two of them missed the images tab.

**Difficulty of Task Node:** Three of the participants thought this task was straightforward. These were the same three participants who failed to see the images tab. The two who did successfully complete the task did not think it was too easy:

“That was difficult. It wasn’t apparent to me where I should go to search by images”. (P2)

“It wasn’t that easy, I thought images would be in “search options”. (P6)
4.4 Post-Usability Test Questionnaire Results

When the usability tests were concluded, each participant was asked to complete a post-usability test questionnaire. The questionnaire consisted of ten open-ended questions. It was designed in this way to elicit as much reaction from the participants as possible.
4.4.1 Overall Impressions of the Application

The first question asked participants to give their overall impression of EBSCO Host Mobile. The comments were almost all positive. Participants were especially impressed with the ease of use and the usefulness of the application for students. Positive comments included:

“Could be very effective in my studies, because I don’t have a laptop. It could be very useful”. (P1)

“Very good. It has the same range as you would have on a PC. It has all the articles”. (P2)

“Very Good. I wouldn’t fault it too much”. (P4)

“Very easy to use and straightforward”. (P6)

The only negative opinion was voiced by P3. She said “it is good but only if you are used to searching for articles on a mobile”.

4.4.2 Grading the Application

The next question asked participants to grade the application and explain why they chose that grade. One participant gave it an “A” grade while four participants felt it deserved a “B” grading. One participant felt it was only worthy of a “C” grading. P1 gave the application an “A” grade because it “would be very suitable for the sort of studies I would use it for”. The participants who gave it a “B” grading were a bit more reserved in their praise of the application. Comments included:

“Very good, but some of the menu items were hard to see and get used to” (P2).

“Good, but I wasn’t used to it, so I found it hard to navigate. It’s probably not that difficult when you get used to it”. (P5)

“IT is pretty good but changing databases each time was a bit of a problem”. (P6)

P3, who only gave it a “C” grade, said that they “found it difficult to find some
stuff, but I am not used to the application or searching on a mobile”.

4.4.3 Features Liked and Disliked

Questions three and four dealt with what participants liked best about the application and what they did not like about it. Participants especially liked its ease of use, effectiveness and accessibility to people on the move. Comments included:

“I liked the fact it’s basically the same service as you get on the PC. It’s not scaled down”. (P1)

“If you are on the move, or if you have no access to a computer, you can still get the info you need”. (P3)

“I liked the way it was easy to use. This is my first time using it and I thought it would be more difficult”. (P4)

“The fact it makes getting information more accessible and easier to get to. It’s good you can do it on the move and you don’t necessarily have to be in the library”. (P6)

The negative points about the application were mainly complaints about the size of the icons and that navigation wasn’t as easy as it should be. Complaints included:

“A problem was I found my finger was too big to hit some of the icons on the screen”. (P1)

“I didn’t like the menu options. The sizes of the boxes were too small. Getting used to the screen wasn’t easy. I found myself pressing the back button constantly to get around it”. (P2)

“It wasn’t easy to type letters on it. Bigger icons definitely needed”. (P5)

Other negative points were to do with completing the tasks themselves.

“Changing databases was a pain. I thought they could make the emailing bit a bit easier. The images bit wasn’t immediately obvious either”. (P6)
4.4.4 Successful Completion of Tasks

Question 5 asked participants if they felt they had been successful in completing the five tasks assigned to them. Four participants felt they did complete all the tasks successfully, while two of them felt they did not. In reality, P1 and P4 did not see the “images” tab necessary for Task 5. They merely entered the search term and then scrolled down to find an image that way. Similarly, in Task 3, P4 and P5 did not deselect one of the databases from a previous search but still felt they got the task correct. In both these tasks, they got a broadly similar result to if they had followed the instructions exactly.

Table 6-No. of Tasks Successfully Completed

<table>
<thead>
<tr>
<th>Participants</th>
<th>No. of Tasks Thought Correct</th>
<th>No. of Tasks Successfully Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>P2</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>P3</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>P4</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>P5</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>P6</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

4.4.5 Alterations to the Application

Questions six and seven of the questionnaire dealt with the issue of changes participants would make to the application and additional options they would like to see implemented respectively. Navigation and icon size were the changes spoken of by four of the six participants. One participant suggested a change to the database search interface, while one of the participants said they couldn’t think of any changes they would make. Comments on how navigation could be
improved included the following comments:

“The boxes are too small. I’d make them bigger. A homepage icon would be a good idea as well”. (P2)

“Bigger buttons are needed. At the moment it’s too hard to select the options you need”. (P4)

P6 said their alteration would be that when “the new search option is chosen, this should reset everything. It shouldn’t remember the last database you used”.

All but one of the participants couldn’t think of any other options they would like to see added to the application. P6 commented that “instead of the envelope as the email option, they could have the word “email” inside the envelope. That would make it quicker to see”.

4.4.6 Use of the Application in Future

This part of the post-usability questionnaire examines the responses to whether they would return to the application themselves in the future and whether they would recommend the application to a fellow student. Participants were unanimous that they would return to this application in the future. Accessibility and functionality were cited as reasons why they would use it again. Comments included:

“Definitely, I would use it again. I could use it while commuting to Dublin on the train” (P1).

“Yes I would. It can be hard getting PCs here so I could use it then”. (P2)

“Yes. It’s handy. The fact you can even email the articles to yourself means you can read them again later if you were stuck for time”. (P3)

All six participants said they would recommend the application to their fellow students. Comments included:

“I would. The programme gives you a lot of info and it’s very easy to use”. (P4)

“Yes, especially for my friends who are doing theses or projects”. (P3)
“Yes, it’s an easy way of getting info. It’s very usable”. (P6)

4.4.7 Other Questions/Comments

Four of the participants had no further questions or comments about the application. P1 asked whether you needed to pay anything to access it while P2 asked whether a mobile version of the library website existed, as it would be convenient if they could check things like opening hours on it while on the move.
5. Discussion

This chapter discusses the data gathered in terms of the two aims of the thesis. It analyses the application in terms of its functionalities, as well as by selected usability attributes. Suggested changes to the interface are outlined.

A section is also included on the benefits that this application and other mobile services could have for Irish academic institutions.

5.1 Functionality of EBSCO Host Mobile

5.1.1 Basic Searching

All six of the participants clicked directly into the database and did not individually select it from a group of databases. As outlined in Fig. 1 (P. 16) and Fig. 4 (P. 19), both the desktop and mobile versions have a single search box which is similar to Google’s. This task was very approachable for students and the task was completed successfully by all.

5.1.2 Multi-Database Searching

The second task was designed to test participants’ ability to successfully search more than one database at a time. In looking at the relevant pre-questionnaire data, only one participant said that they perform multi-database searches. Despite the inexperience of the participants, each one managed to navigate to the list of databases page and attempted to select the two databases requested. However, database selection errors and correcting them, meant four of the participants were slower than the participants who completed this task without any problems. Part of this problem was the “fat finger” problem in relation to touchscreens. According to Wigdor et al. (2009), “there are two elements of the fat finger problem: occlusion of the screen by the finger, and the reduction of the contact area to a single point can sometimes cause users to ‘miss’ targets they are physically touching”. According to the same authors, to minimise the risk of accidental activation of buttons, a visual feedback mechanism (changes in visual appearance to indicate that the input has been received) should be in operation. In the case of EBSCO Host Mobile, this is merely a tick icon. This is illustrated on the left side of Fig. 33. The desktop database selection page can be observed in
Fig. 32. In the desktop version, users have precision over their selection of databases, as they have the use of a mouse for selection. Users rely on a touchscreen on the mobile version, so a different visual feedback mechanism is needed.

An alternative way of giving a visual clue is outlined on the right hand side of Fig. 33. On the left is the current interface with a small button to press. On the right are the same two databases highlighted, but with alterations made by the author. Here there is a much bigger box which is highlighted once pressed. It is envisaged that once any part of the database’s name was pressed, this would select the database. The tick is retained and the entire box is highlighted in a colour that fits in well with the overall interface. Suggested alterations called for by four participants in the post-evaluation questionnaire were that button sizes should be bigger. This alteration would also address an issue that was dominant in the negative comments of question four of the same questionnaire; the fact that button sizes are too small.
Fig. 32 Database Selection Page on Desktop Version
In question six of the pre-usability test questionnaire, participants were asked if they ever emailed articles they retrieved from academic databases to themselves. All but one of them said they had not done this. The first problem was working out how to email an article. In examining the “efficiency” node (available in Appendix H), it can be observed that two of the participants scrolled around the screen for a minute, as the email option was not immediately obvious. This delayed them in completing the task. The email icon is represented by an icon of an envelope in a light grey colour. This is the same icon used in the desktop version. Once a user hovers over any of the icons featured with the mouse, the HTML title attribute of the icon is revealed. This is illustrated in Fig. 34. In the mobile version, no such obvious clue exists. In observing the current interface on the left side of Fig. 35, the HTML and PDF options are clearly labeled. There is no label for the email functionality. A suggested alternative is illustrated on the right side of Fig. 35. This carries a similar label to the HTML and PDF options.
and fits in with the aesthetics of the application. This would address the complaint of P6 who said “I didn’t see the email icon straightaway. Maybe they could have a link that says ‘email’”. According to the World Wide Web Consortium (2008), users’ intentions are to find out specific pieces of information that are relevant to their context, when using the Mobile Web. Therefore it is essential to make it as quick and as easy as possible for them to achieve these goals.

Fig. 34 Close Up of Desktop Version with Email Button Highlighted
Fig. 35 Current Email Option and Suggested Alternative Icon on the Right

This option allows users to send articles of interest to their email addresses so they can retrieve them easily in the future. This was one of the reasons given by P3 as to why the application would be worth returning to in the future: “The fact you can even email the articles to yourself means you can read them again later if you were stuck for time”.

The email option was seen as very useful by participants and this functionality should be highlighted and made as easy as possible as outlined in the suggested changes.

Another problem in the completion of this task was that P4 clicked into the PDF version of an article retrieved and scrolled around to find an option to email which did not exist. This forced them to go back and look for the icon on the previous page. To promote the email functionality, an email option should also
be provided once a user clicks into the PDF version of the document.

The next issue was that both P4 and P5 failed to deselect databases from a previous search and did not fully successfully complete the task. Both users selected the “new search” option which retains the previous database(s) automatically. Fig. 36 shows that when the “new search” option is selected, the Business Source Complete database is retained, as it was the one used for the previous query. The right side of Fig.36 illustrates that when the “choose databases” option is pressed, the previous database is retained automatically. Neither participant fully deselected the previous databases. This meant they were searching databases which had no relation to the search term they were looking to find articles on. This was similar to P2, who, in the previous task, experienced this issue. To avoid confusion, it may be better to design the application in such a way as to reset the search completely once the “new search” option is pressed. In this way, students can select the databases they feel are the correct ones for their search.
5.1.4 Advanced Searching

The pre-usability test questionnaire tells us that participants were evenly divided in their use of advanced searches with three saying they have performed searches limited by author, date, year etc., with the other three saying they have not. Task four was designed to see if participants could manage to perform a successful advanced search. Participants performed well in this task. One problem, which was consistent throughout testing of the application, was that button sizes were too small. In this task, participants had to manually enter the full four digits of the years they wanted the search limited to. Selecting the box itself, as well as selecting the digits required use of the touchscreen, with the usual problems experienced. The “fat finger” problem could be alleviated, at least in terms of selecting the years, by borrowing the slider technique of the desktop version.

Fig. 36 “New Search” Option and Retention of Database(s) Selected
This technique would work well in a touchscreen, as it would be much quicker than manually selecting digits. Fig. 37 illustrates the slider for year selection on the right.

![Fig. 37 Slider Option for Year Selection in Desktop Version](image)

The final task asked participants to search for articles in a database by image. This option is referred to by EBSCO as their “Image Quick View” functionality. Pertinent thumbnail images such as charts, photos, maps and illustrations are added to result list items. Full-sized images can be viewed by clicking on any thumbnail image in the results list, without even opening the article first (EBSCO Image Quick View, 2010). At present, even if a curious user hits the “images” tab, they go straight into the “Image Quick View” section with no introduction to its advantages. Fig. 38 shows the desktop version of Ebsco Host’s new “SmartText” service. As this is a new service, a hyperlinked “Hint” option is beside it. A summary of this functionality appears once the link is opened. Fig. 39 illustrates a suggested change to the interface. A “hint” button shows a quick summary of the added value of the “Image Quick View”. The “Hint” option is at the top left of the screen, next to the “images” tab. It is blue and underlined, so users should immediately recognize it as a hyperlink. The right hand side of Fig.
39 illustrates a summary of this functionality once the “Hint” button is pressed.

Fig. 38 Desktop Version of Ebsco Host with “SmartText” Searching Explained
The successful completion of the search database by image task was poor, as only two participants managed to complete the task fully. Four participants completely failed to see the “images” tab which was located beside the “new search” tab. This is illustrated on the top left of Fig. 40. The tab was not sufficiently highlighted to make it obvious that this was what should be pressed. Two of the participants tried to look for an images option in the advanced search menu, as it appeared logical to them that it would be there. P5 gave up at this point as they felt that they had spent too much time searching, and they could not see the option. Once P2 and P6 had successfully found the images tab, they immediately had no problem in completing the task. It would seem to be a good idea to provide such an option in the advanced search options, as well as make it more obvious in the main page interface.

It would be essential that further usability testing of any suggested changes...
5.2 Attributes of Usability for EBSCO Host Mobile

This part of the discussion section deals with evaluating the usability of EBSCO Host Mobile using the five usability attributes outlined earlier in the thesis.

5.2.1 Learnability

Nielsen (2003b) defines learnability as answering the following question: “How easy is it for users to accomplish basic tasks the first time they encounter the design?” Analysing the pre-usability test questionnaire, it can be observed that five of the six participants were already familiar with library databases, with four participants having used at least one EBSCO database in the past. However, in relation to iPhones, none of the participants had used one before. Three of them, however, had at least some experience with a Web-enabled mobile device, having used an iPod. Only one had used a mobile device to conduct academic research before. Participants were therefore prime candidates to assess the learnability of the application.

Task one proved very easy for users to complete. All six participants said that
this task was straightforward.

Task two proved a bit more difficult for participants. Both P3 and P4 didn’t select the correct databases initially while P6 noticed that the application had kept a previous database selected, despite them pressing “new search” which they assumed would reset the search completely. Participants found this task relatively easy to complete.

Task three was reasonably easy for users to learn how to perform this functionality. The main issue here was the email icon not being highlighted.

Task four could be considered to have passed the learnability test. Five out of the six participants agreed that this was an easy task.

Task five could not be considered to have been a success in relation to the learnability attribute. Only two of the participants managed to search the database by image. The tab for images did not seem to be highlighted enough, while there is real doubt as to whether students know what the “image quick view collection” actually is.

Blandford and Buchanan (2003) believe that learnability is simply how easily users can learn to use the system. Overall, it can be said that participants learned how the basics of the system worked quite quickly, but some other features such as email icons, selection of databases and searching databases by image are not as easy to learn as they should be.

5.2.2 Navigation

Nielsen and Loranger (2006) argue that a consistent navigational structure is a fundamental concept in navigation and that good navigation should be predictable and make people feel comfortable exploring the site without fear of losing their way. In examining the “navigation nodes” (available in Appendices F-J), it is clear that whatever problems participants had in completing tasks, navigation was not a significant one.

5.2.3 Efficiency

Task completion time is the primary way of measuring efficiency. The error
percentage and time spent on errors are all ways of measuring this usability attribute (Abran et al., 2003). Task one was completed quickly and efficiently by five out of six participants. Database selection problems, as well as trouble in finding the email icon were the main efficiency problems in the next two tasks. Database selection problems also affected P2’s time in completing Task 4. Task 5 could not said to be completed efficiently by any of the participants. Only two of them completed it successfully and they both took some time in finding the “images” tab. Overall, the application could be said to be reasonably usable in relation to efficiency, but needless time expended could be cut down by some alterations to the interface already outlined.

5.2.4 Effectiveness

The International Organization for Standardization (1994) defines effectiveness as “the accuracy and completeness with which users achieve specified goals”. In perusing the “effectiveness” node, it can be observed that the application has a mixed record here in terms of this usability attribute. Task one presented no problems in successful completion. Task two was also completed successfully by five of the participants. Although all participants successfully sent an email in task three, they did not meet the second criteria of the International Organization for Standardization, as they did not successfully select the databases asked of them. Task four was completed accurately by all six participants. Task five was only accurately completed by two of the six participants. The suggested changes of resetting searches to zero databases selected when the “new search” button is pressed, as well as a synopsis of what the “image view collection” would be likely to increase the successful task percentage rate.

5.2.5 Aesthetics.

The application did very well in this final usability attribute. The way of judging what participants thought of this application is by the “get it” testing part of the usability test. The initial reaction of participants was very positive and they were particularly complimentary of the colours used. In analysing the results of the test itself, the only possible negative point regarding aesthetics was that the “images” tab and email icon blended into the background too much. The greater aesthetics achieved by this was at the sacrifice of efficiency and effectiveness, as
students did not see these options as quickly as they should have.

5.3 The Value of EBSCO Host Mobile

The second aim of this study is to determine what value Web-enabled mobile devices have in providing library services.

This aim is subdivided into the following objectives:

1) To investigate what mobile services are becoming available globally for libraries
2) To assess what provision of mobile services is provided for by Irish academic libraries
3) To suggest ways in which Irish academic library services can be improved

An investigation into library mobile services becoming available was undertaken and is outlined in the literature review. Innovative libraries are increasingly turning to smartphones and iPods to deliver services in a new way. Specially designed mobile websites, mobile collections, library apps and databases for mobile devices are all appearing as options for Web-enabled handheld device users. Other mobile services for Irish students will doubtless appear in the near future.

EBSCO Host Mobile was received very positively by students in the post-usability test questionnaire. Participants were unanimous that they would return to this application in the future. It was perceived as quite easy to use and useful, as remote access to databases and articles was possible while “on the move”. All participants in the pre-usability test questionnaire said that they would like their timetable to be made available via mobile devices, while four of them wanted room bookings to be available. P2 asked whether the entire library site could be made available via a mobile device, as it would be convenient if they could check things like opening hours on it while on the move.

All participants said they would recommend the application to a friend. However, none of the participants were aware that the college library provided
this service. Any college or university that has this facility available should make strenuous efforts to market such a cutting edge technology. According to Kroski, (2008b), libraries must master the Mobile Web to bring patrons services that they are coming to expect from content providers, including mobile versions of their websites. Dublin Business School provides electronic resources accessible from handheld mobile devices such as E-Books, the library catalogue and EBSCO databases. However, having contacted the libraries of all seven of the Republic of Ireland’s universities, only the University of Limerick and University College Dublin subscribe to the EBSCO Host Mobile service. Neither university has yet promoted this service. Dublin City University is currently looking at their databases to identify which ones are available via a mobile device and planning to promote this option to their user community. The libraries at National University of Ireland, Maynooth and National University of Ireland, Galway are currently looking at redeveloping their library websites to make them smartphone compatible. Neither library had heard of the EBSCO mobile service, but both said they would now be researching it.

Universities and third level colleges must strive to ensure that library and information services being provided are made available on as wide a platform as possible. Part of this should mean making these services available via Web-enabled mobile devices. Academic librarians should investigate whether there is a demand for services like this application, as well as other services, such as optimising the library website for smartphone users. They could then implement services such as: designing specialised library websites for mobile browsers, creating mobile OPACs and making collections, e-books and databases available on a mobile-friendly format.
6 Conclusion

6.1 Recommendations

Following the analysis and discussion of the results of the usability test of EBSCO Host Mobile, the following recommendations for improving the usability of the application are recommended.

Database Selection

At present, selecting databases is difficult because of the “fat finger” problem. The buttons to select databases are too small, and the visual feedback mechanism to show selection of databases is only a tick icon. It is recommended that it would be re-designed so that once any part of the database’s name is pressed, this selects the database. This is illustrated in Fig. 14 (p 53). The tick is retained and the entire box is highlighted in a colour that fits in well with the overall interface. It would also address a feature that was dominant in the negative comments of question four of the same questionnaire: button sizes being too small.

Emailing Articles

The email icon is currently represented by a light grey icon of an envelope. It does not immediately stand out. Fig. 15 (p. 55) shows the alternative layout incorporating a box around the envelope in a distinctive colour. The word “Email” on top of the icon would draw attention to this functionality for students who didn’t know of this option. This would fit in well with the current page, as both the download formats of HTML and PDF have similar layouts. Furthermore, an email option should also be provided once a user clicks into the PDF version of the document. This option is not currently available.

“New Search” Option

At present, the default when this option is pressed is to keep previous database(s) selected automatically from the previous search. In the course of this usability test, participants did not notice this. This meant they were searching databases which had no relation to the search term they were looking to find articles on. The recommendation here is that, when the “new search” option is pressed, it
should reset all databases as de-selected and allow the user to select which ones they require.

Image Quick View

This is an innovative new service that allows users to see images such as charts, photos, maps and illustrations added to result list items. There seems to be very little user awareness of this facility. At present, no explanation is given for this option. A quick summary of the added value of this option should be provided, once a user clicks on the “images” tab as outlined in Fig. 16 (p 57). Furthermore, this option should also be included in the advanced search options.

The chief aim of this research is to evaluate the usability of accessing library and information services from EBSCO Host Mobile. More specifically, it is to assess whether the application meets the usability attributes of learnability, navigation, efficiency, effectiveness and aesthetics. Where usability problems were detected, possible solutions have been proposed. In assessing this application for appropriate functionality, users were studied performing typical tasks on the application using the iPhone.

The application can said to be usable in terms of the learnability usability attribute. Apart form learning how to use the “images” option, it can be said that participants learned how the basics of the system worked quickly. Some other features such as email icons and searching databases by image were not as easy as they should have been. The application did well in terms of navigation, with students traversing the interface quite easily. It did not fare so well in terms of efficiency, with needless time being wasted by participants due to certain options not being obvious enough. Participants’ effectiveness in completing tasks was only partially successful. Overall, the application can be said to be usable but could easily be improved. The author has suggested alterations to the interface that should greatly decrease time spent completing basic tasks and increase the success rate of tasks completed accurately.

The other aim of this study is to determine what value library services accessed via Web-enabled mobile devices have. By conducting an extensive literature
review, the author investigated best practice in providing library mobile services. Irish Academic libraries need to start adopting services to fit students’ need for information ‘on the go’. Currently, Irish academic libraries do not seem to be providing much in the way of library services via mobile technology for Web-enabled devices. Academic librarians should investigate whether there is a demand for services like this application, as well as other services, such as optimising the library website for smartphone users. Depending on each library, specifically designed mobile-friendly library websites could be designed to provide services such as the OPAC, digital collections and databases. Once enacted, this could provide a useful way of marketing the institution and mobile services should be heavily promoted.

6.2 Future Work

Should any of the recommendations be implemented, testing would have to take place to see if they have solved some of the problems participants experienced with this application. This would ensure that the usability of the application has been improved. Further study could also be made on the usability of specially designed mobile library websites that are accessed via Web-enabled handheld devices. A more extensive study could also be carried out to ascertain the level of library services available on Web-enabled mobile devices being provided to students in Irish colleges. An evaluation of user requirements would also be useful for academic libraries to determine what library services their students would like available on Web-enabled mobile devices.
APPENDICES

Appendix A

EBSCO Host Mobile Usability Test Script [Adapted from Krug (2005)]

Introduction

I am here today to test the usability of the EBSCO Host Mobile application on the iPhone. This application allows researchers to access EBSCO databases via smartphones and other Web-enabled smartphones. I will be testing a number of features of this application such as choosing databases, downloading articles in HTML and PDF format and advanced search functionalities.

I want to make it clear I am testing the application, not you. You can’t do anything wrong here so please don’t feel like you are making mistakes.

I want to hear exactly what you think, so please don’t worry that you are being too critical. The point of this process is to improve it, so I need to know how you honestly feel about it. As we go along, I will be prompting you to say exactly what you are looking at, what you are trying to do and what you are thinking. If you have any questions, just ask. I may not be able to answer them right away, since I am interested in how people do when they don’t have someone sitting next to them. I want you to try and solve any problems by yourself but I will try and answer any questions you have when we are finished.

With your permission, I’m going to video the mobile phone screen and what you have to say. The video will be used only to help me assess the usability of the application and it won’t be seen by anyone else except me. I will destroy all personal data after the study.

Would you mind signing this video recording release form to say you don’t mind me videotaping the session and using the video as I just explained?

Do you have any other questions before we begin?
Appendix B

Video Recording Release Form

I would be grateful if you could sign and date the following statement:

I understand that my test session will be recorded. I give permission to Ronan Hegarty to videotape this test session. I understand that the resulting video will be used only to evaluate the usability of EBSCO Host Mobile and won’t be seen by anyone except Ronan Hegarty. The videotape will be destroyed after the study.

Signed:………………………………

Date:………………

Thank you for your time

Ronan
Hegarty
Appendix C

Usability Test Pre-Evaluation Questionnaire

1) Student Type

- Undergraduate _______
- Postgraduate _______
- Part-Time _______

2) If you search online for academic material, what search engine/databases/other systems do you use?

- Google _____
- Yahoo _____
- Google Scholar ______
- WebFeat (Library Databases) ______
- Library catalogue ______
- Other. (Please Specify) ______

3) Which of the following databases available from the library website do you use?

- Academic Search Complete _____
- Business Source Complete _____
- Computers & Applied Sciences Complete _____
- Emerald ______
- Film & Television Literature Index _____
- GreenFILE ______
- Hospitality & Tourism Complete _____
- Library, Information Science & Technology _____
- PEP Archive ______
- PsycARTICLES ______
- Regional Business News _____
- SocINDEX ______
4) Do you ever perform advanced searches (limiting results by author, date, year, peer-reviewed etc)?

5) Do you ever perform multi-database searches?

6) Do you ever email articles you have retrieved to yourself?

7) Were you aware that the library provided this service?

8) What other features would you like to be made accessible by mobiles?

- Catalogue
- Timetable
- Reading List
- PC Bookings
- Room Bookings
- Other (Please Specify)

9) Do you own or have ever used a smartphone (iPhone, Android, BlackBerry, Palm 750) or Web-enabled mobile device (eg. iPod)?

10) Have you ever used a mobile phone/device to conduct academic research?
Appendix D

Usability Test Post-Evaluation Questionnaire

1) What are your overall impressions of the application?

2) If you had to give the application a grade, from A to F, where A was outstanding and F was failing, what grade would you give it, and why?

3) What are the features you liked best about the application?

4) What features did you not like about the application?

5) Did you feel you successfully completed all of the tasks you were given? If not, why do you think this was so?

6) If you could make one significant change to this application, what change would you make?

7) Are there options you would like to see added to the application? Which ones?

8) Would you return to this application on your own in the future? Why/why not?

9) Would you recommend this application to a fellow student? Why/why not?

10) Do you have any other questions or comments about the application or your experiences with it?
APPENDIX E

Get it Testing Node

P1 get it testing
Yeah it looks ok. I think it looks similar to the databases you get on the pc. I’m not used to the touchscreen thing though, so it might take a while for me to get used to that..

P2 get it testing
It’s quite similar to the full version you’d get on the pc.

P3 get it testing
It’s seems ok yeah, I’m not used to searching databases though as am only a part-time student so we’ll see how I get on with it

P4 get it testing
It looks fairly nice yeah, it’s kind of like the PC version.

P5 get it testing
It looks quite attractive. The colours look pretty good.

P6 get it testing
Yeah it looks quite nice. I like the colours. I’m used to touchscreens on my iPod so it should be handy enough to scroll up and down and move around in it I’d say.
APPENDIX F

Task 1 Nodes (Student quotations are in black and description of their activities are in red)

Problems (Task 1)

There’s Business Source Complete, so I’ll click that and enter it... and search.

P2 goes into business source complete enhanced which is an option at the bottom. He realises he has gone wrong and utilises the back button. He then just clicks directly into Business Source Complete and enters the search term

Efficiency (Task 1)

P2 hits search without changing the original search term

Oh no that’s the previous term, I’ll go back

Ok, so I need to put in “mobiles and libraries”.

P2 enters the term and presses search. P2 clicks into the third article found.

I’ve to send an article to an email address.

P2 doesn’t see the email icon which is at the top of the screen and scrolls down all the way to the bottom and back up to the top and sees the icon.

Effectiveness (Task 1)

I’ll type “internal audit” yeah? I can download any article...in PDF. Oh there’s PDF. So I presume this is it.

P1 clicks first PDF file. It is quite a large file and it eventually opens up.

P2 clicks the entire file and it opens up. P2 does not click directly on the PDF option. P2 sees the PDF icon and the file opens. P2 does not click on the file to open it up so it can be read.

P3 clicks the entire file and it opens up. P3 clicks on a PDF file and it downloads. P3 does not click on the file to open it up so it can be read.
P4 clicks directly into Business Source Complete and enters the search term
So I need to find a PDF file, yeah?
P4 clicks the entire file and it opens up. P4 does not click on the file to open it up so it can be read.

P5 clicks directly into Business Source Complete and enters the search term
So I just need to find a PDF article?
P5 clicks the entire file and it opens up. P5 does not click on the file to open it up so it can be read.

So I need to find a PDF file. There’s a PDF so I’ll click into that.
P6 clicks PDF file and it opens up. P6 clicks on the article to open it up so it can be read.

Navigation (Task 1)
NO NODES HERE

Difficulty of Task (Task 1)

HOW EASY OR DIFFICULT WAS IT TO COMPLETE THAT TASK?
Yeah that was easy enough really. It downloaded quick enough

It was a little tricky I had trouble getting into the database but once I opened it, it was easy enough

Yeah it’s just a case of getting used to the interface

That was easy enough really.
That was easy.

Yeah that was easy enough really. It downloaded quick enough
APPENDIX G

Task 2 Nodes

Problems (Task 2)

P2 scrolls down to ensure all of the databases are deselected and selects PEP Archive and Psyc Articles.
Oh I accidentally selected three databases, I’ll have to go back
P2 hits this option and deselects Business Source Complete and types in “narcissism “ as directed.
Ok so I’ll click into this one
P2 clicks directly into the article and not html full text format
I can probably download it without having to go into it. So I need to go back

P3 scrolls down to ensure all of the databases are deselected and selects PEP Archive and Psyc Articles.
Ok I wonder do I just click into them.
P3 hits the PEP ARCHIVE database only and types in “narcissism “as directed.
Ok so I’ll click into this one
P3 selects the HTML Full Text format and it downloads. FAILS TO COMPLETE TASK

P4 presses back button. They then see the new search option. They press this.
So I need to select PEP Archive and Psyc ARTICLES.
P4 clicks into just the PEP Archive
Ok I’ve only selected one so I’ve to go back for the other one.

So I need to select PEP Archive and Psyc ARTICLES. Oh it seems to have kept the first database
I selected, there’s three now selected, I only need two, isn’t it?
P6 presses back button and “deselect all” to deselect all of the databases chosen.
Will that take it off?
P6 scrolls down to ensure all of the databases are deselected and selects PEP Archive and Psyc Articles.
Ok, so I’m going to press continue at the top. Ok that didn’t work, I’ll press “choose databases”.
Efficiency (Task 2)

P2 scrolls down to ensure all of the databases are deselected and selects PEP Archive and Psyc Articles.
Oh I accidentally selected three databases; I’ll have to go back
P2 hits this option and deselects Business Source Complete and types in “narcissism “as directed.
Ok so I’ll click into this one
P2 clicks directly into the article and not html full text format
I can probably download it without having to go into it. So I need to go back

P4 presses back button. They then see the new search option. They press this.
So I need to select PEP Archive and Psyc ARTICLES.
P4 clicks into just PEP Archive
Ok I’ve only selected one so I’ve to go back for the other one.

So I need to select PEP Archive and Psyc ARTICLES. Oh it seems to have kept the first database
I selected, there’s three now selected, I only need two, isn’t it?
P6 presses back button and “deselect all” to deselect all of the databases chosen.
Will that take it off?
P6 scrolls down to ensure all of the databases are deselected and selects PEP Archive and Psyc Articles.
Ok, so I’m going to press continue at the top. Ok that didn’t work, I’ll press “choose databases”.

Effectiveness (Task 2)

P1 scrolls to the top and presses “continue” then enters the search term
Ok, I might pick a smaller file this time,
P1 selects the HTML Full Text format and it downloads.

I can probably download it without having to go into it. So I need to go back
P2 clicks back
P2 selects the HTML Full Text format and it downloads.
P3 scrolls down to ensure all of the databases are deselected and selects PEP Archive and Psyc Articles.
Ok I wonder do I just click into them.
P3 hits the PEP ARCHIVE database only and types in “narcissism “as directed.
Ok so I’ll click into this one
P3 selects the HTML Full Text format and it downloads. FAILS TO COMPLETE TASK

<P4>
P4 deselects Business Source Complete and types in “narcissism “as directed.
P4 selects the HTML Full Text format and it downloads.

<P5>
P5 sees the “choose database” option and then ensures all of the databases are deselected and selects PEP Archive and Psyc Articles.
P5 deselects Business Source Complete and types in “narcissism “as directed.
P5 selects the HTML Full Text format and it downloads.

<P6>
Ok, so I’m going to press continue at the top. Ok that didn’t work; I’ll press “choose databases”.
P6 hits this option and deselects Business Source Complete and types in “narcissism “as directed.
P6 selects the HTML Full Text format and it downloads.

Navigation (Task 2)

<P1>
P1 presses back button. They press back again. They get back to the page where they can deselect databases.

<P2>
So I need to select PEP Archive and Psyc ARTICLES.
P2 scrolls down to ensure all of the databases are deselected and selects PEP Archive and Psyc Articles.
Oh I accidentally selected three databases; I’ll have to go back
P2 hits this option and deselects Business Source Complete and types in “narcissism” as directed.
Ok so I’ll click into this one
P2 clicks directly into the article and not html full text format
I can probably download it without having to go into it. So I need to go back

<P3>
P3 presses back button. They then get on to the list of databases page.
So I need to select PEP Archive and Psyc ARTICLES.
P3 scrolls down to ensure all of the databases are deselected and selects PEP Archive and Psyc Articles.
Ok I wonder do I just click into them.
P3 hits the PEP ARCHIVE database only and types in “narcissism” as directed.

So I need to select PEP Archive and Psyc ARTICLES. I’m not sure how to do this. I guess I can choose this option “choose databases”

So I need to select PEP Archive and Psyc ARTICLES. Oh it seems to have kept the first database I selected, there’s three now selected, I only need two, isn’t it?
P6 presses back button and “deselect all” to deselect all of the databases chosen.
Will that take it off?
P6 scrolls down to ensure all of the databases are deselected and selects PEP Archive and Psyc Articles.
Ok, so I’m going to press continue at the top. Ok that didn’t work, I’ll press “choose databases”.

**Difficulty of Task (Task 2)**

It was straightforward enough. I see you can see the size of the file which is handy if you don’t have a fast internet connection as you know it will take a long time to download.

It was ok but the buttons are quite small so I selected 3 databases when I meant to select 2.

It’s not that self explanatory really.

I suppose it was easy enough once I had got the right databases selected

That was quite easy once I had got the right databases selected but the icons are very small and it is tricky to select the ones you need

It wasn’t as easy as it should be. When you press “new search”, it should not remember the previous databases selected. It should be a completely new search
Appendix H

Task 3 Nodes

Problems (Task 3)

P2 hits search without changing the original search term
Oh no that’s the previous term, I’ll go back
Ok, so I need to put in “mobiles and libraries”.
P2 enters the term and presses search. P2 clicks into the third article found.
I’ve to send an article to an email address.
P2 doesn’t see the email icon which is at the top of the screen and scrolls down all the way to the bottom and back up to the top and sees the icon.
Oh right, there’s an envelope icon so that should be it. So I’ll just fill in the “email to” and that should be it

P4 hits back button and presses the search databases option.
P4 selects the database required and presses continue. P2 does not go directly into the database. Mistakenly, P2 FAILS TO DESELECT PSYC Articles
P4 enters the term and presses search. P2 clicks into the third article found.
So I can send any article I like to an email address.
P4 clicks into the PDF version of an article. There is no email option here.

So I need to go back again.
P5 hits back button and presses the search databases option.
P5 selects the database required and presses continue. P5 does not go directly into the database. Mistakenly, P5 FAILS TO DESELECT PSYC Articles

P6 doesn’t see the email icon which is at the top of the screen and scrolls down all the way to the bottom and back up to the top.
I’m just trying to find out where it could be. Oh...here it is. Ok theres an “email from” field, I presume I enter my email address into the “email to” field.
Efficiency (Task 3)

P2 hits search without changing the original search term
Oh no that’s the previous term, I’ll go back
Ok, so I need to put in “mobiles and libraries”.
P2 enters the term and presses search. P2 clicks into the third article found.
I’ve to send an article to an email address.
P2 doesn’t see the email icon which is at the top of the screen and scrolls down all the way to the bottom and back up to the top and sees the icon

P4 enters the term and presses search. P2 clicks into the third article found.
So I can send any article I like to an email address.
P4 clicks into the PDF version of an article. There is no email option here.
Ok, so I’ll have to go back and click into the article
P4 sees the email icon which is at the bottom of the screen after P4 scrolls down all the way to the bottom.
The envelope icon, that should be it. So I’ll just fill in the “email to” and that should be it

P6 doesn’t see the email icon which is at the top of the screen and scrolls down all the way to the bottom.
I’m just trying to find out where it could be. Oh...here it is. Ok there’s an “email from” field, I presume I enter my email address into the “email to” field.

Effectiveness (Task 3)

I presume I enter my email address into the “email to” field.
P1 enters the email address and hits the send button
Email is sent.

P2 doesn’t see the email icon which is at the top of the screen and scrolls down all the way to the bottom and back up to the top and sees the icon.
Oh right, there’s an envelope icon so that should be it. So I’ll just fill in the “email to” and that should be it
P2 fills in this field and presses send
Email is sent.

P3 sees the email icon which is at the top of the screen immediately.
That must be it. So I just fill in the “email to” bit, yeah?
Email is sent.

P4 selects the database required and presses continue. P4 does not go directly into the database.
Mistakenly, P4 FAILS TO DESELECT PSYC Articles

P4 sees the email icon which is at the bottom of the screen after P4 scrolls down all the way to
the bottom.
The envelope icon, that should be it. So I’ll just fill in the “email to” and that should be it
P4 fills in the email address and hits the send button

P5 sees the email icon which is at the top of the screen.
The envelope icon, that should be it. So I’ll just fill in the “email to” and that should be it
Email is sent.

P6 doesn’t see the email icon which is at the top of the screen and scrolls down all the way to the
bottom and back up to the top.
I’m just trying to find out where it could be. Oh...here it is. Ok there’s an “email from” field, I
presume I enter my email address into the “email to” field.
Email is sent.

Navigation (Task 3)

P2 sees the email icon which is at the top of the screen and scrolls down all the way to the
bottom and back up to the top. So it’s an envelope icon so that should be it. So I’ll just fill in the “email to” and that
should be it

P4 hits back button and presses the search databases option.
P4 selects the database required and presses continue. P4 does not go directly into the database.

<Internals|P5>
So I need to go back again.
P5 hits back button and presses the search databases option.
P5 selects the database required and presses continue. P5 does not go directly into the database.

<Internals|P6>
P6 doesn’t see the email icon which is at the top of the screen and scrolls down all the way to the bottom and back up to the top.

**Difficulty of Task (Task 3)**

<Internals|P1>
No problem really, the email icon was fairly self explanatory.

<Internals|P2>
That was handy enough actually, it was easy to figure out that that icon was the email one.

<Internals|P3>
That one was easy. I saw the email icon straight away.

<Internals|P4>
Slightly tricky, but once you play around with it, its ok.

<Internals|P5>
That was easy, I saw the icon straight away.

<Internals|P6>
I didn’t see the email icon straight away. Maybe they could have a link that says “email”
Appendix I

Task 4 Nodes

Problems (Task 4)

Initially, P1 went into the text box where you enter the search term
Ok so that’s not right I need to go to search options.

P2 has trouble selecting the correct databases
That’s awkward enough to deselect and select the databases you want.

P3 then mistakenly enters the publication field to put in the date range
Ok so I’ll click into this field and put in the years. Ok maybe thats not right, I’ll go back.
P3 goes back to search options and enters the date
You don’t need the month do you?
P3 enters all of the search terms and clicks on the first result

So it has to be peer reviewed and full text. Ok so I may need to scroll down to find them.
P5 selects both these options and also selects the date option from 2009 to 2010.
P5 makes a mistake by initially entering the search term in the publications field.
Ok, I need to delete that and put it in at the top

Efficiency (Task 4)

Initially, P1 went into the text box where you enter the search term
Ok so that’s not right I need to go to search options.

Ok so I just want to go back again to get the list of databases. I need to go to choose databases
P2 has trouble selecting the correct databases
That’s awkward enough to deselect and select the databases you want.

P3 then mistakenly enters the publication field to put in the date range
Ok so I’ll click into this field and put in the years. Ok maybe that’s not right, I’ll go back.

P5 selects both these options and also selects the date option from 2009 to 2010.
P5 makes a mistake by initially entering the search term in the publications field.
Ok, I need to delete that and put it in at the top

**Effectiveness (Task 4)**

P1 selects “search options”
So it has to be peer reviewed and full text.
P1 selects both these options and also selects the date option from 2009 to 2010. P1 enters the search term as asked. And downloads the first article found.

P2 selects both these options and also selects the date option from 2009 to 2010. P2 enters the search term as asked. And downloads the first article found.

P3 then mistakenly enters the publication field to put in the date range
Ok so I’ll click into this field and put in the years. Ok maybe that’s not right, I’ll go back.
P3 goes back to search options and enters the date
You don’t need the month do you?
P3 enters all of the search terms and clicks on the first result

P4 selects both these options and also selects the date option from 2009 to 2010. P4 enters the search term as asked. And downloads the first article found.

P5 enters the search term as asked and downloads an article

P6 selects both these options and also selects the date option from 2009 to 2010. P6 enters the search term as asked. And downloads the first article found.
Navigation (Task 4)

P1 hits the back button twice then sees “new search” and “choose databases”, P1 deselects unwanted databases and highlights the GreenFILE database and presses “continue”
Initially, P1 went into the text box where you enter the search term
Ok so that’s not right I need to go to search options.
P1 presses done to go back to first screen

Ok so I just want to go back again to get the list of databases. I need to go to choose databases
P2 has trouble selecting the correct databases
That’s awkward enough to deselect and select the databases you want.

Ok so I just want to go back again to get the list of databases. I need to go to choose databases
P4 hits “choose databases”; P4 just goes straight into the GreenFILE database.

Difficulty of Task (Task 4)

Yeah that was easy enough really. It downloaded quick enough

It was easy enough, once I knew to go into search options. It was just making sure I highlighted the right ones.

It was tricky enough. Didn’t think it was that clear

It was easy enough, once I knew to go into search options. It was just making sure I highlighted the right ones.

It wasn’t too bad considering I don’t normally do advanced searches.
It was easy enough, once I knew to go into search options. It was just a case of highlighting options then.
Appendix J

Task 5 Nodes

Problems (Task 5)

P1 deselects unwanted databases and highlights the Business Source Complete database and presses “continue”
P1 doesn’t see the images tab and goes directly into the text box and enters the search term. He scrolls down to find an article that has an image in it.

P2 doesn’t see the images tab and goes directly into the text box and enters the search term. All right, that’s not it, so I need to go back.
P2 presses back to get back to main screen
There’s an images button here. I’ll click that I suppose

P3 doesn’t see the images tab and goes directly into the text box and enters the search term. P3 scrolls down to find an article that has an image in it.

P4 doesn’t see the images tab and goes directly into the text box and enters the search term. P4 scrolls down to find an article that has an image in it.

So I am guessing it is in search options
P5 goes into search options
Ok I don’t see it here to be honest; i don’t know how to do this
P5 fails to complete task

P6 doesn’t see the images tab and goes directly into the text box and enters the search term. Maybe its in search options
P6 goes into search options but can’t see an images options, P6 presses back to get back to main screen
...oh wait, here’s images
P6 scrolls down to find an article that has an image in it.
Efficiency (Task 5)

P2 doesn’t see the images tab and goes directly into the text box and enters the search term. All right, that’s not it so I need to go back. P2 presses back to get back to main screen. There’s an images button here. I’ll click that I suppose.

So I am guessing it is in search options. P5 goes into search options. Ok I don’t see it here to be honest, i don’t know how to do this.

P6 doesn’t see the images tab and goes directly into the text box and enters the search term. Maybe its in search options. P6 goes into search options but can’t see an images options, P6 presses back to get back to main screen. ...oh wait, heres images.

Effectiveness (Task 5)

P1 doesn’t see the images tab and goes directly into the text box and enters the search term. He scrolls down to find an article that has an image in it.

P2 clicks the images tab and enters the search term. P2 scrolls down to find an article that has an image in it.

P3 doesn’t see the images tab and goes directly into the text box and enters the search term. P3 scrolls down to find an article that has an image in it.

Right, so I’ll put in “investing in commodities” P4 doesn’t see the images tab and goes directly into the text box and enters the search term. P4 scrolls down to find an article that has an image in it.
P5 goes into search options
Ok I don’t see it here to be honest, I don’t know how to do this
P5 fails to complete task

P6 goes into search options but can’t see an images options, P6 presses back to get back to main screen
...oh wait, here’s images
P6 scrolls down to find an article that has an image in it.

Navigation (Task 5)

P1 hits the back button then sees “new search” and “choose databases”, P6 deselects unwanted databases and highlights the Business Source Complete database and presses “continue”

P2 hits the back button then sees “new search” and “choose databases”, P2 deselects unwanted databases and highlights the Business Source Complete database and presses “continue”
Right, so I’ll put in “investing in commodities”
P2 doesn’t see the images tab and goes directly into the text box and enters the search term.
All right, that’s not it so I need to go back.
P2 presses back to get back to main screen
There’s an images button here. I’ll click that I suppose
P2 clicks the images tab and enters the search term
P2 scrolls down to find an article that has an image in it.

Difficulty of Task (Task 5)

P1 hits the back button then sees “new search” and “choose databases”, P6 deselects unwanted databases and highlights the Business Source Complete database and presses “continue”
P2 hits the back button then sees “new search” and “choose databases”, P2 deselects unwanted databases and highlights the Business Source Complete database and presses “continue”
Right, so I’ll put in “investing in commodities”
P2 doesn’t see the images tab and goes directly into the text box and enters the search term.
All right, that’s not it so I need to go back.
P2 presses back to get back to main screen
There’s an images button here. I’ll click that I suppose
P2 clicks the images tab and enters the search term
P2 scrolls down to find an article that has an image in it.

P1 hits the back button then sees “new search” and “choose databases”, P6 deselects unwanted databases and highlights the Business Source Complete database and presses “continue”
P1 hits the back button then sees “new search” and “choose databases”, P6 deselects unwanted databases and highlights the Business Source Complete database and presses “continue”

P2 hits the back button then sees “new search” and “choose databases”, P2 deselects unwanted databases and highlights the Business Source Complete database and presses “continue”
Right, so I’ll put in “investing in commodities”
P2 doesn’t see the images tab and goes directly into the text box and enters the search term.
All right, that’s not it so I need to go back.
P2 presses back to get back to main screen
There’s an images button here. I’ll click that I suppose
P2 clicks the images tab and enters the search term
P2 scrolls down to find an article that has an image in it.

It was just like the first task, I just had to find a picture in one of the articles

It wasn’t that easy but once I looked around the page, I found it

I think it was easy enough

I thought it was ok
That was hard, it wasn’t apparent to me where I should go to search by images

It wasn’t that easy I thought images would be in search options
Appendix K

Human Subjects Exemption from Ethical Review Form

Part A: General Information

1. Project Details

   a) Project Title
   Evaluating the Usability of Library Services Accessed via EBSCO Host Mobile

   b) Projected start date
   May 1

   c) Projected duration of study
   Final deadline 30 September

   NOTE: In no case will approval be given if recruitment and/or data collection has already begun

2. Applicant details

   a) Name
   Ronan Hegarty  Student [✓]  Staff [ ]

   b) UCD School / Department / Institute
   School of Library and Information Studies

   c) UCD Telephone  UCD E-mail
   0863106863  ronan.hegarty@ucdconnect.ie

   d) Name of Supervisor (to be completed by students only)
   Dr. Judith Wusteman

   e) Investigator(s) and Affiliations (name all investigators on project)
   Ronan Hegarty
f) UCD Investigator(s) and Affiliations


g) Funding Source and Amount (if applicable)


h) Insurance/Indemnity arrangements approved (As a member of UCD you are obliged to seek approval from the UCD Safety Officer (safety@ucd.ie) to ascertain whether you are insured to carry out your research)

[ ] Yes [ ] No

Please note: if insurance is required you will need to include details as supporting documentation

i) Research Keywords (up to four):

Usability; User-centred design; Mobile Web; Information Services

Part B: Research Design & Methodology

3. Research Proposal

Using the following headings provide a brief description of your research

a) Aims and objectives of the study (in brief – no more than 300 words)

The chief aim of this research is to evaluate the usability of accessing library and information services from EBSCO Host Mobile.

This aim can be subdivided into the following objectives:
1) To assess whether the application meets the usability attributes of learnability, navigation, efficiency, effectiveness and aesthetics.

2) To propose possible solutions to any usability problems encountered

This will be assessed by studying users performing typical tasks with the application on an iPhone and seeing if the functionality is appropriate and usable for the target audience. The tasks in the usability test will assess users’ ability to:

1) Retrieve articles in PDF and HTML format
2) Email articles
3) Perform advanced searches
4) Perform multi-database searching
5) Search databases by image

The other aim of this study is to determine what value library services accessed via Web-enabled mobile devices have.

This aim can be subdivided into the following objectives:

1) To investigate what mobile services are available for libraries worldwide
2) To assess what provision of mobile services is provided for by Irish academic libraries
3) To suggest ways in which Irish academic library services can be improved

b) Research design

Usability testing

c) Who are the participants or informants? (size and composition)
d) Methods of data collection

<table>
<thead>
<tr>
<th>Method</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) standard educational practices</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) standard educational tests</td>
<td></td>
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<td>c) standard personality tests</td>
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<td>d) standard psychological tests</td>
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<tr>
<td>e) surveys or interviews</td>
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<td>f) public observations</td>
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<tr>
<td>g) research involving persons elected to or candidates for public office</td>
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<td>h) research which uses only existing data</td>
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<tr>
<td>i) surveys and/or questionnaires</td>
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<td>j) recorded interviews</td>
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<td>k) focus groups</td>
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<tr>
<td>l) Other: (please specify) Usability Testing</td>
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</tbody>
</table>

e) Will the collected data be anonymised or identifiable?

<table>
<thead>
<tr>
<th>Method</th>
<th>Yes</th>
<th>No</th>
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</thead>
<tbody>
<tr>
<td>(please tick the relevant box and provide detail)</td>
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<tr>
<td>identifiably: [✓] anonymised [ ] identifiable</td>
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</table>

Part C: Basis for Exemption

4. Research Participants: Risk, Harm, Selection and Consent

a) Is this research likely to involve any foreseeable risk to participants, above the level experienced in everyday life?

| [ ] Yes | [✓] No |

b) Does this research involve the following: [you are advised to read the HREC Guideline Documents – see HREC Policies & Guidelines]

- any vulnerable groups?

| [ ] Yes | [✓] |

No
- Sensitive topics that may make participants feel uncomfortable i.e. sexual behaviour, illegal activities, racial biases, etc. [ ] Yes [✓] No

- use of drugs [ ] Yes [✓] No

- invasive procedures (e.g. blood sampling) [ ] Yes [✓] No

- physical stress/distress, discomfort [ ] Yes [✓] No

- psychological/mental stress/distress [ ] Yes [✓] No

- deception of/or withholding information from subjects [ ] Yes [✓] No

- access to data by individuals or organizations other than the investigators [ ] Yes [✓] No

- conflict of interest issues [ ] Yes [✓] No

- or any other ethical dilemmas [ ] Yes [✓] No

5. Has this proposal received Ethical Approval from another body (e.g. Hospital REC)?

[ ] Yes [✓] No (if your answer is no please proceed to Section D)

6*

a) Name of the organisation that has approved the study?

b) Approval No: ________________
c) Approval Date: ____________

(provide a copy of the approval)

d) Provide a brief account of aspects of study not covered by approval.


e) Can you confirm that only those aspects of the study over which the approving body has jurisdiction and has approved are subject to this application for grant of approval?

[ ] Yes [ ] No

f) Can you confirm that you will seek full ethical approval from UCD HREC for all non-approved aspects of the study?

[ ] Yes [ ] No

7.

a) Have all aspects of the protocol received ethical approval from an approved body

[ ] Yes [ ] No

b) Does the approving body have jurisdiction over all aspects of the study?

[ ] Yes [ ] No

*Note: a grant of approval with exemption from review will only be granted by UCD HREC for those aspects of the study that have been approved and are under the jurisdiction of the approving body

Part D: Declaration

I, the undersigned researcher, have read the UCD Guidelines and Policy for Ethical Approval of Research Involving Human Subjects and Further Exploration of the Process of Seeking Ethical Approval for Research and agree to abide by them in conducting this research. I confirm that, based on my understanding of these guidelines and policy documents, I consider that this research protocol meets the requirements for exemption.
from review.

I confirm that the information provided on this form is correct and accurate.

I apply for Approval for Exemption from review of the research protocol summarised below, on the basis that: (indicate category)

a) All aspects of the protocol have received ethical approval from an approved body (e.g. Hospital REC) [ ]
b) These aspects of a larger research protocol have received ethical approval from an approved body (e.g. Hospital REC). [ ]
c) The research protocol meets the criteria for exemption from review as detailed in Section 3 of Further Exploration of the Process of Seeking Ethical Approval for Research [✓]

Signature of Principal Investigator:

Ronan Hegarty__________________________

Date: 19 / 06 / 2010

Endorsement of Supervisor / Head of School

I have read the above application, and am satisfied that the study appears to meet all requirements for a Grant of Ethical Approval with Exemption from Review from UCD HREC.

Signature of Supervisor / Head of School: __________________________

Date: / /


QSR International (2008b) **Getting Started** [Internet] Available from:
[Accessed 22 July, 2010].


