

***USE OF A CORE CONCEPT SEARCH TOOL FOR THE
INFORMATION LITERACY EDUCATION OF UNDERGRADUATE
STUDENTS***

By

Victoria Redfern

A thesis submitted in partial fulfillment of the requirements for the degree of

Master of Information Studies (Research)

University of Canberra

2012

Acknowledgements

Days, weeks, months, years, tears, fears, anguish, pain, joy and laughter are elements that accompany any major research and thesis. However, the loneliness and time passes very quickly especially with the support of supportive and superlative heroes. Friends, colleagues and especially family are the glue, the spine, the unwritten pages and the text between the lines. Thanks Will.

Olga Raskin is a beautiful woman in so many ways. She has been my best friend, cohort, stalwart and confidante for many years and it was her belief that I could achieve so much. Olga encouraged me to take flight from the high rocky outcrop, to soar and seek the sun. The sun now warms my wings as I am lifted and carried globally on life soaring thermals. Spasibo moya lublue Olechka.

I offer my great thanks to my supervisors, Professor Stuart Ferguson and Dr Peter Donnan who have contributed an enormous amount of their time and experience to assist me in my studies.

I am grateful and give thanks to Dr Auriol Weigold who was the subject convener for International Studies Foundations. Thanks Auriol.

I would especially like to thank Ron Miller for his past editorial effort, assistance and advice he provided when it came down to the wire. Thanks Ron.

Other persons who I am thankful for their support and assistance are Carol Kayrooze, Linda Li, Coralie McCormack, Linda Hort, Faiz Hassan, Bruce Maun, David Pedersen, Sumaira Qureshi, Malcolm Marshall and, the inimitable Cath Raby.

Abbreviations

ABS	Australian Bureau of Statistics
ACRL	Association of College and Research Libraries
ALIA	Australian Library and Information Association
ANU	Australian National University
CIT	Canberra Institute of Technology
GNP	Gross National Product
HCI	Human Computer Interface
HTML	Hypertext Markup Language
HTTP	Hypertext Transfer Protocol
IP	Intellectual Property
IR	Information Retrieval
LC	Library of Congress
NESB	Non-English Speaking Background
OOP	Object Oriented Programming
PHP	PHP: Hypertext Processor (formerly <u>P</u> ersonal <u>H</u> ome <u>P</u> age)
SARS	Severe Acute Respiratory Syndrome
SMS	Short Messaging Service
URL	Uniform Resource Locator
WoS	Web of Science
WWW	World Wide Web
XML	Extended Markup Language

List of Tables

Table 1: Summation of important terminology used.....	43
Table 2: Google search using the term asynchronous switching	88
Table 3: Online information seeking training and tools	96
Table 4: Five Bruce faces and five elements of Rootza alignment	132
Table 5: Bruce and Rootza information seeker alignment	136
Table 6: Example of core concept search terms on the Rootza page	158
Table 7: Countries of birth of all participants	169
Table 8: Country of primary education	170
Table 9: Country of secondary education.....	172
Table 10: Number of years living in Australia.....	173
Table 11: Participant degree enrolment.....	174
Table 12: Participant course subjects completed.....	175
Table 13: Participant spoken first language	176
Table 14: Participant spoken second language.....	177
Table 15: Comfort with computer technology	180
Table 16: Home computer hours of weekly use	181
Table 17: Home computer used for study or recreation	182
Table 18: University computers hours of weekly use	183
Table 19: Age group frequency	184
Table 20: Library electronic database use	185
Table 21: Library electronic journals use	186
Table 22: Library E-reserve collection use	187
Table 23: Netscape use	188
Table 24: Microsoft Explorer use.....	189
Table 25: Google use.....	190
Table 26: Comparison of information seeking tool use	191
Table 27: Other search engine or search tool use.....	192
Table 28: Named other search engines or information search tools	193
Table 29: Participant demographics and percentages	195
Table 30: Dominant information seeking tools and percentage.....	196
Table 31: Both groups pre-test six steps of information seeking comparison	202
Table 32: Differential presenting pairs of adjectives	221
Table 33: Participant opinion of Rootza -the online search tool	224

List of Figures

Figure 1: Information Matrix.....	44
Figure 2: Bruce and Rootza five faces interaction blend	138
Figure 3: WWW searching without using Rootza.....	141
Figure 4: WWW searching using Rootza.....	142
Figure 5: Flow process leading to the building of the tool.....	149
Figure 6: The Rootza path.	152
Figure 7: Diagrammatic structure of the database.....	161
Figure 8: Participant age groups.....	168
Figure 9: All participant pre-test named six steps of information seeking.....	200
Figure 10: Both groups pre-test named six steps of information seeking	201
Figure 11: Both groups post-test six steps of information seeking	202
Figure 12: Experimental group pre-test post-test six steps of information seeking	203
Figure 13: Question 1. Identified Search Terms	206
Figure 14: Question 1. Both groups pre-test identified search terms	207
Figure 15: Question 1. Both groups post-test identified search terms	208
Figure 16: Question 1. Both groups pre-test post-test identified search terms	209
Figure 17: Question 2. All participant identified search terms	210
Figure 18: Question 2. Both groups pre-test identified search terms	211
Figure 19: Question 2. Both groups post-test identified search terms	212
Figure 20: Question 2. Both groups pre-test post-test identified search terms	213
Figure 21: Question 3. All participants pre-test identified search terms.....	214
Figure 22: Question 3. Both groups pre-test identified search terms	216
Figure 23: Question 3. Both groups post-test identified search terms	217
Figure 24: Question 3. Both groups post-test identified search terms	218
Figure 25: Both groups criteria for academic citation comparison	219
Figure 26: Phase 2 Question 1. 'Was the online search tool helpful?'.....	233
Figure 27: Phase 2 Question 2. What was learnt from the online search tool.....	234
Figure 28: Phase 2 Question 3. Would users pay for using the online search tool	235

Table of Contents

Acknowledgements	vii
Abbreviations.....	ix
List of Tables.....	xi
List of Figures.....	xiii
Abstract.....	xxi
1 Introduction	23
1.1 Background to the Study - The Problem and its Significance.....	23
1.2 Research Problem	28
1.3 Aims and Objectives.....	29
2 Literature Review	47
2.1 Outline and Literature Review Issues Being Addressed	50
2.2 Information Literacy and IL Frameworks	51
2.3 Undergraduate student problems in finding research material.....	57
2.4 Information Seeking Behaviour	74
2.5 Studies and Evaluations of Various Solutions.....	85
2.6 Summary and Contribution to the Body of Research.....	98
3 The Research Design	105
3.1 A Two-Phase Study.....	105
3.2 Phase 2 of the Study	111
3.3 The Experiment Process	118
3.4 Phase 1 of the Study	119
3.5 Phase 2 Population, Sample and Demographics	127
4 Design of the core concept thesaural database and search tool (Rootza)	129
4.1 What is Rootza?.....	130
4.2 Theoretical Design of Rootza.....	131
4.3 Rootza™ System Overview	139

4.4	Rootza Preliminary Development	143
4.5	Rootza System Specification	150
5	Findings	164
5.1	Results	166
5.2	Demographics	166
5.3	Control and Experimental Groups - Age Statistics	184
5.4	Experiment Pre-test Results	197
5.5	Knowledge of Six Steps of Information Seeking	200
5.6	Search Terms and Questions	205
5.7	Control and Experimental Groups Pre-test Post-test Comparison	218
5.8	Experimental Group T-test – Search Term Identification Pre-test Post-test Results	219
5.9	Web page Criteria Evaluation for Academic Citation.....	219
5.10	Participant Opinion of the Online Search Tool	220
5.11	Findings from Phase 2	231
5.12	Assumptions	232
5.13	Conduct of the Evaluation	232
5.14	Question Responses.....	233
5.15	Participant Perception of Rootza	236
5.16	Evaluation Summary	245
6	Discussion and Conclusions	248
6.1	Introduction and Research Problem	248
6.2	Summary of Results	250
6.3	Undergraduate student problems in finding research material.....	253
6.4	Undergraduate student problems in recognizing authoritative research material	256
6.5	Studies and evaluations of various solutions.....	258
6.6	Implications for Teaching Information Literacy	259
6.7	Implications of the Research	261
6.8	Limitations of the Study	263
6.9	Recommendations and Future Research	264
6.10	Significance and Contribution of the Research	264
6.11	Concluding Remarks	266

REFERENCES	270
APPENDICES	239

Abstract

Through largely experimental research, this thesis addresses the problems faced by many undergraduate students in finding appropriate research materials for their academic work. Problems include identifying the best search terms to use with the various information retrieval tools and recognizing authoritative materials in the result sets. The problems are made more critical by the tendency for younger students to go straight to the Web because they have experience in using search tools such as Google and find the university-provided tools relatively difficult to use. The study also identifies at-risk groups such as those who lack digital literacies.

The study set out to establish whether an educational tool that combined information literacy instruction with a web search facility would help undergraduate students find appropriate research materials and develop the information literacy understandings and skills required for university study. A unique purpose-built tool, with embedded thesaural database, was developed and then a two-phase test was conducted. There were three sub-questions in this research; can an online search tool improve student information seeking knowledge/skills, assist students with identification of search terms and assist with evaluation of appropriate research materials?

The Phase 1 experiment was a pre-test/post-test experiment using a questionnaire. There were three pre-post research questions which participants were asked to answer providing search terms and any of the steps of information seeking and the criteria for recognizing the authority of found materials. After collecting pre-test data that helped identify existing knowledge of the six steps of information seeking and authority of research material, the pre-test post-test data was to enable comparison of the results.

The post-test result of the Phase 1 experiment showed that 21.6% could identify some basic steps of information seeking whereas the pre-test result was 8.1%, representing an increase of 13.5%. This is the level of increase in knowledge aimed for in the research design however because of the sample size the findings are not conclusive. Regarding the criteria for identifying the authority of found material, following the pre-test post-test comparison 44.4% addressed one criterion, four participants 22.2% addressed two criteria, 16.6% addressed three criteria and 22.2% addressed four criteria. This shows an increase in the knowledge of recognition of authoritative materials.

The Phase 2 group used the tool while the researcher, using talk-aloud protocols, collected information about participants' tool use and their observations. Phase 2 contributed to the study by students providing verbal input that they recognized the importance of using correct search terms.

The experiment was unique, in embedding information literacy instruction in a web search tool, at point-of-need. It provided positive responses to suggest that further research and development in this field would have important educational impacts. The small sample size indicates that the results lack statistical significance. The thesis suggests ways to overcome the study's limitations and to broaden the evaluation such as the use of a library information literacy package as a control in future evaluation and testing.