Integration of the Research Skills Development Framework and Blackboard-mediated synchronous library research skills training modules to enhance student research skills in an undergraduate program

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Strategic objectives addressed:

• Designing or redesigning sustainable programs for onshore and offshore delivery, including flexible delivery
• Improving student retention or the cohort experience.
The project is also strategically aligned with RMIT Graduate Attributes.

Internal order number: 360425

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• Loc Nguyen, RMIT Library Vietnam.

Funding scheme

<table>
<thead>
<tr>
<th>Funding scheme</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LTIF contestable</td>
<td>X</td>
</tr>
<tr>
<td>Program Development Fund</td>
<td></td>
</tr>
<tr>
<td>RMIT Vietnam Program Development Fund</td>
<td></td>
</tr>
</tbody>
</table>
1 Executive summary

The aims of this 2014 LTIF project were to measure the impact of a targeted research skill development program on students’ attitude towards, and proficiency with, library research skills.

The project aimed to align course curriculum with the Research Skills Development Framework (RSDF) and library research skills (LRS) modules to ensure that students were exposed to research skill development.

The project design was primarily an intervention study with pre- and post- analysis focusing on two undergraduate Management courses delivered across three locations: Introduction to Management at RMIT Melbourne, RMIT Vietnam and SIM, and Leading for Change at SIM and RMIT Vietnam.

Library interventions, in the form of online learning activities that supported incremental skill development, were aligned to course content and assessment across both courses. Online learning was supported by face-to-face Library training delivered at all sites.

The study involved pre-intervention focus groups, a pre- and post-intervention student survey, and the mapping of research skill development to course learning outcomes and assessment. Teaching staff were engaged with the project through a series of face-to-face workshops, and supported by teaching notes that accompanied the library interventions.

The analysis tested a number of hypotheses relating to students’ level of confidence in their research skills, their ability to undertake research at an appropriate level, and their understanding of the relevance of research skills to future employability. The project’s findings supported the proposition that direct intervention through a targeted and embedded library research skill program would enhance students’ research skills and attitudes to library research:

- Students’ confidence in their research skills increased post-intervention.
- The proportion of quality citations used by students in their submitted work increased post-intervention, as did the number of quality citations used.
- Qualitative feedback provided by academics on student essays supported the hypothesis that interventions contribute to a positive relocation of students across the Research Skill Development grid.
- Students in the post-exposure cohorts performed better in their written assessments than students in the pre-exposure cohort.
- The Research Skill Development framework afforded greater clarity in expectations of the depth of research required for assessment tasks.
- Enhanced understanding of the quality of cited literature in essays gave students and assessors a common framework within which to evaluate this aspect of submitted work.

The project delivered an effective and sustainable model for the development of students’ library research skills across an undergraduate program, with an approach that delivered equitable, just-in-time support for students regardless of their location or time zone.
2 Outcomes

The project was intended to enhance the research skills of students enrolled in two undergraduate Management courses delivered in Melbourne, Vietnam and Singapore, through the integration of Blackboard-mediated synchronous library research skills training modules with course learning outcomes and content.

The project was an intervention study delivered to students enrolled in the common core course Introduction to Management (BUSM 4176 Melbourne, BUSM 4185 Vietnam and BUSM 4192 SIM and the final year course Leading for Change (BUSM 4188 Vietnam and BUSM 4194 SIM).

The intervention study took the form of:

- pre-intervention focus groups held in all three locations
- pre- and post-intervention student surveys conducted on all three locations
- a program of online library interventions, supported by face-to-face training for librarians on all three locations.

It was supported by workshops run for academic staff in Melbourne, Vietnam and Singapore.

As a result of this intervention study, students’ academic outcomes were improved with regard to their ability to find, synthesise and reference appropriate scholarly sources for their assessments, and confidence in their ability to conduct scholarly research were increased.

The project delivered a sustainable model for teaching research skills to large classes across multiple locations, using online learning resources explicitly linked to course learning outcomes and embedded in Blackboard course shells to provide equitable, just-in-time access to learning resources.

The project also tested the Research Skill Development Framework (RSDF) as a tool for mapping incremental research skill development to course learning outcomes. While the RSDF proved a useful tool for incrementally mapping research skill development within a course, the complex program structures at RMIT University, including the absence of prerequisite requirements and the multiple pathways available to students, meant that the project was unable to effectively map research skill development across what were nominal first-year and third-year courses.

3 Project outcomes and impacts

This project aimed to improve student (and therefore graduate) capability in library research skills, directly impacting on academic outcomes. The proposed project deliverables were:

- Enhanced library research skills for students enrolled in the target courses, evidenced through improved assessment outcomes.
- Creation of reusable online learning resources relating to research skill development, aligned to curriculum and course learning outcomes.
- Development of a sustainable model for delivering research skill training to large classes across multiple locations.
- Validation of the Research Skill Development Framework as a tool for incrementally developing students’ research skills.
- Enhanced collaboration in course design and delivery between academic and library staff.
3.1 Project outcomes

3.1.1 Enhancement of students’ research skills
The project was intended to develop students' library research skills, and to have a positive impact on their academic outcomes. The outcomes and impacts of the project on students research skill development are detailed in section 3.21-3.2.6.

In general, the project interventions resulted in improved levels of student confidence in their research skills, evidence of enhanced research skills, and improved academic outcomes.

The project used the Research Skill Development Framework, developed by Willison et al at the University of Adelaide, to identify appropriate research skills and learning outcomes for students in both courses, and to develop a scaffolded training plan that would transition students’ research skill development across the Management program.

While the RSDF proved a useful tool for informing incremental skills development at the course level, the complexity of program/course structures at RMIT made it difficult to accurately scaffold research skill training plan across the life of the program. The lack of prerequisite course requirements and the multiple pathways into the program meant that many students did not undertake the nominal first-year Introduction to Management course prior to undertaking the nominal final-year Leading for Change course.

3.1.2 Collection of reusable learning resources
The project delivered a program of Library interventions, in the form of a suite of online learning resources that were aligned with course content for Introduction to Management and Leading for Change. These learning resources included instructional videos, interactive learning activities, self-test quizzes, and images, and were accompanied by teaching notes that described the purpose of each resource.

The Library interventions were embedded in Blackboard course shells, in order to be accessible to students at all locations and at any time. They were designed to be reusable and will be stored in, and made available from, the RMIT Learning Repository. They will also form part of a larger collection of online learning resources to support research skill development across the University, a Library project for 2015. A table describing the research skill interventions and learning outcomes is available at https://equella.rmit.edu.au/rmit/items/3f71c958-7b9e-403a-ab0f-478d219da6f6/1/.

Selected learning resources from the project have already been re-used in the Library’s iSearch research skills tutorial - www.rmit.edu.au/library/isearch - and in research skills training for other Business courses.

The online learning resources were supported by face-to-face training delivered by librarians in Melbourne, Vietnam and Singapore. This training was based on standard lesson plans to ensure that face-to-face training was aligned across all three locations.

3.1.3 Sustainable course delivery model
The delivery of Blackboard-mediated library training proved an effective model for supporting research skill development in large classes across multiple locations.

The model was:

- sustainable, through the use of online learning resources that can be reused and repurposed for application beyond the target courses
- equitable and consistent, providing all students with access to the same learning resources regardless of location or time zone, and with access to face-to-face training that was aligned across all three participating libraries
- global in approach, with learning resources designed with appropriate content, language, and context for students across all locations.
3.1.4 Enhanced academic-library cooperation

The project fostered closer collaboration between academic and library staff at RMIT Melbourne, RMIT Vietnam and the Singapore Institute of Management. This collaboration was both within cohorts, i.e. academic-to-academic and librarian-to-librarian, and across cohorts.

The project took a Course Management Team approach to curriculum design and delivery, with academics and librarians working in partnership to align research skill development to curriculum and assessment. The project also resulted in closer working relationships between library staff across the three libraries, with a significant increase in engagement between RMIT University Library and SIM Library.

3.2 Project impacts

The project was designed to enhance students’ library research skills through the inclusion of targeted assessment task support activities.

The project methodology generated a series of hypotheses that, if supported, would indicate a positive impact on students’ research skills.

Sections 3.2.1 - 3.2.6 describes the hypotheses and the outcomes.

3.2.1 Changes in students’ self-reported research skills confidence

Willison and his co-workers developed a survey tool that measures elements of student confidence in and attitudes towards information literacy skills.

The project team adopted the Willison survey as a primary measure of students’ confidence in their ability to find and analyse information and of their views on the centrality of information literacy to their subsequent professional careers. (The Willison survey is further described in Appendix X.)

The project considered the Willison survey elements to aggregate into five categories of ability and attitude in relation to obtaining information to support coursework and assessment tasks:

- ability to find information
- ability to analyse information
- ability to describe information
- attitude towards the importance of information literacy skills in undergraduate career
- attitude towards the importance of information literacy in future employment / career

Hypothesis 1: Intervention increases scores in the twenty statement Willison survey

The table below, detailing the percentage of students who agreed or strongly agreed with the Willison statements, split responses by exposure status to the information literacy interventions.
<table>
<thead>
<tr>
<th>Statement</th>
<th>Students agreeing or strongly agreeing</th>
<th>Mantel-Haenszel odds ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>pre-exposure</td>
<td>post-exposure</td>
</tr>
<tr>
<td>Find 1</td>
<td>85.7</td>
<td>89.6</td>
</tr>
<tr>
<td>Find 2</td>
<td>46.3</td>
<td>63.3</td>
</tr>
<tr>
<td>Find 3</td>
<td>81.0</td>
<td>77.6</td>
</tr>
<tr>
<td>Find 4 #</td>
<td>16.7</td>
<td>10.9</td>
</tr>
<tr>
<td>Analyse 1</td>
<td>73.8</td>
<td>80.7</td>
</tr>
<tr>
<td>Analyse 2</td>
<td>76.8</td>
<td>82.2</td>
</tr>
<tr>
<td>Analyse 3</td>
<td>85.7</td>
<td>87.2</td>
</tr>
<tr>
<td>Analyse 4</td>
<td>73.8</td>
<td>81.8</td>
</tr>
<tr>
<td>Describe 1</td>
<td>68.3</td>
<td>79.9</td>
</tr>
<tr>
<td>Describe 2</td>
<td>53.7</td>
<td>75.7</td>
</tr>
<tr>
<td>Describe 3</td>
<td>58.5</td>
<td>82.2</td>
</tr>
<tr>
<td>Describe 4</td>
<td>87.8</td>
<td>88.8</td>
</tr>
<tr>
<td>Feeling 1</td>
<td>53.7</td>
<td>59.9</td>
</tr>
<tr>
<td>Feeling 2</td>
<td>78.0</td>
<td>91.4</td>
</tr>
<tr>
<td>Feeling 3</td>
<td>56.1</td>
<td>61.3</td>
</tr>
<tr>
<td>Feeling 4</td>
<td>90.2</td>
<td>92.6</td>
</tr>
<tr>
<td>Future 1</td>
<td>85.7</td>
<td>93.8</td>
</tr>
<tr>
<td>Future 2</td>
<td>90.5</td>
<td>89.5</td>
</tr>
<tr>
<td>Future 3</td>
<td>66.7</td>
<td>74.4</td>
</tr>
<tr>
<td>Future 4</td>
<td>83.3</td>
<td>89.1</td>
</tr>
</tbody>
</table>

# Find 4 is a negatively worded question

* Statistical significance at 95% confidence interval

The analysis shows an improvement in 18 of the 20 Willison themes with exposure to research skill interventions.
The project team was surprised at the high level of confidence in research skills expressed by students in the pre-exposure cohort. As detailed in the table above, students’ confidence in their ability to find, analyse and describe information was very high. This seemed discordant with the comments from course team staff who, at the beginning of the project, listed students’ inability to engage with the academic literature as a major impediment to good outcomes.

Student scores across the twenty elements in the Willison survey were aggregated to generate an overall score, which might be broadly be thought to represent student confidence in information literacy / research skills.

This aggregated measure is represented in the histogram below for the two cohorts of students - pre-exposure (blue bars, semester 1) and post exposure (green bars, semester 2).

As evidenced in the histogram, students’ self-rated confidence in their research skills increased following intervention.

### 3.2.2 Student performance in online tests

Students in the course Introduction to Management complete a series of online tests as part of their formal assessment.

The online tests are designed to assess students’ understanding of the broad themes and ideas in contemporary management practice.

The second hypothesis in the project methodology is that student performance in the online tests would improve after exposure to the research skill interventions.

As the online tests are closed ended and auto-assessed in Blackboard with no moderation, the project team has assumed that an improvement in mean score in the exposure cohort might be expected.

The following table details student performance in the Introduction to Management course in Melbourne and Singapore for students not exposed to the interventions (Sem 1) and those exposed (Sem 2). Other campuses were excluded from this analysis because there was not an equivalent assessment task conducted in the same online format.
3.2.3 Students' ability to source and cite “quality” material

Implicit in the project design was a belief that many students struggle to find and cite high quality information sources in their submitted work. The project team determined “quality” to mean information sources from peer reviewed and or scholarly publications.

One of the research skill interventions focussed on source quality so there was an expectation that students exposed to this intervention would cite few sources that did not meet the quality criterion.

The Melbourne offering of the course Introduction to Management required students to write an essay on a provided management topic and specified that the information sources be scholarly.

Other course offerings were excluded from this review because they did not include an essay as part of the assessed work.

The project team developed two hypotheses to address the anticipated benefit of the interventions; that the proportion of scholarly citations would increase and that the total number of citations would increase.

### Improvement in proportion of quality citations

The following table details the mean percentage of overall citations that the project team deemed to be “scholarly” in the pre-exposure (semester 1 and post-exposure (semester 2) cohorts

<table>
<thead>
<tr>
<th>Grade achieved</th>
<th>HD</th>
<th>DI</th>
<th>CR</th>
<th>PA</th>
<th>NN</th>
<th>all grades</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUSM 4176 sem 1, 2014</td>
<td>74%</td>
<td>67%</td>
<td>67%</td>
<td>57%</td>
<td>50%</td>
<td>59%</td>
</tr>
<tr>
<td>BUSM 4176 sem 2, 2014</td>
<td>83%</td>
<td>70%</td>
<td>64%</td>
<td>64%</td>
<td>66%</td>
<td>69%</td>
</tr>
</tbody>
</table>

There was a significant improvement in the number of quality citations included in essays that was apparent in all grade bands.

### Increase in the total number of citations

The following table details the mean number of citations that students included in their submitted work in the pre-exposure (semester 1 and post-exposure (semester 2) cohorts

<table>
<thead>
<tr>
<th>Course</th>
<th>Median score</th>
<th>Mean score</th>
<th>s.d.</th>
<th>Median score</th>
<th>Mean score</th>
<th>s.d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUSM 4176 (Melbourne)</td>
<td>28 (out of 40)</td>
<td>27.8</td>
<td>5.7</td>
<td>30 (out of 40)</td>
<td>29.5</td>
<td>4.5</td>
</tr>
<tr>
<td>BUSM 4192 (Singapore)</td>
<td>24 (out of 30)</td>
<td>23.7</td>
<td>3.1</td>
<td>25 (out of 30)</td>
<td>24.3</td>
<td>3.5</td>
</tr>
</tbody>
</table>
The improvement in overall citations was most pronounced in the lower grades. The overall increase in mean number of citations (8.4 to 13.7).

### 3.2.4 Students' ability to conduct research in support of their assessment tasks

Integral to the project design was the incorporation of the Research Skills Development (RSD) framework into course planning and delivery.

Course team members were asked to map expectations of student work to the RSD framework. This resulted in clearer guidance to students on the extent to which there were expected to be “independent researchers” when planning their assessment tasks.

The RSD framework does not have an inbuilt measurement tool for determining student performance so the project team devised a qualitative approach that attempted to locate student submitted work on the RSD “grid”.

This entailed a stratified sampling of student papers from the Introduction to Management and the Leading for Change courses in Melbourne and Singapore and positioning each student’s work on the RSD grid.

The following table lists all the assessment tasks used across the two courses over the calendar year, the testing level (Bloom’s taxonomy) and whether the submitted work was evaluated with the RSD framework.

<table>
<thead>
<tr>
<th>Assessment type</th>
<th>Bloom's taxonomy</th>
<th>RSDF facets and expected levels</th>
<th>Student work evaluated against RSDF?</th>
</tr>
</thead>
</table>
| online MCQ test               | low order thinking (remembering)  | Facet A level 1  
Facets B level 1  
Facets C - F not applicable in MCQ test setting                                               | no                                  |
| leadership development report | high order thinking analysing, evaluating, creating) | Facet A level 3  
Facet B level 3  
Facet C level 3  
Facet D level 3  
facet E level 2  
Facet F level 3                                                                                         | yes                                 |
Review of student work in the Leadership Development report and the Group Essay revealed that there was a general improvement (migration to higher levels in respective facets) in the post-exposure cohorts of students.

However, the research team acknowledged that locating student work in any particular “cell” in the RSD grid was somewhat subjective and was also influenced by the extent to which high level research was expected in the assessment task.

A secondary source of “reassurance” that the improvement was real was the comments included in the assessor feedback to students.

The following excerpts from assessor feedback help to illustrate this point.

**Pre-exposure essay**

“A suggested format has been followed to clarify the essay task using an appropriate approach. The structure is logical. A range of relevant references are used to support your arguments and multiple relevant sources show different views for each key point. The essay shows a lot of research underpinning the arguments. The essay is well researched and relies on credible quality sources.”

**Post-exposure essay**

“The essay question has been refined and focused with the aid of theory and concepts. There is clear evidence of deep analysis, evaluation and interpretation of theory sources to tailor the focus and outcomes of the research. There are examples of the utilisation of relevant terminology to describe concepts and findings. The essay is structured to not only address the central question, but also, to reveal issues for further examination.”

In summary, the qualitative feedback provided by academics on student essays supports the hypothesis that interventions contribute to a positive relocation of students across the RSD grid; in this case from largely Level 2 Bounded Research to Level 3 Scaffolded Research. Higher grade students demonstrated elements of Levels 4 and 5, which appeared to be closely linked to critical thinking and analysis skills, which were in turn supported by competent research skills.
The following is an example of the assessor feedback for a distinction-level student who was
"the range of relevant references has enabled you to consider multiple aspects of the topic area. Literature sources are used to compare and contrast a wide variety of approaches and frameworks. It is a creative approach to choose a 'target audience' as a focus for your evaluation."

3.2.5 Students' overall course performance

Implicit in the project assumptions was that Improved research skills would generate better student performance.

The hypothesis generated was that research skills intervention increases students' overall course score.

Results for each course delivery location in the pre and post exposure cohorts were collated as detailed in the following tables.

BUSM 4176 Introduction to Management (Melbourne) – Semester One 2014

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Online tests</th>
<th>Essay</th>
<th>Overall score</th>
</tr>
</thead>
<tbody>
<tr>
<td>median</td>
<td>28.5</td>
<td>34</td>
<td>62</td>
</tr>
<tr>
<td>mean</td>
<td>27.85</td>
<td>33.31</td>
<td>60.26</td>
</tr>
<tr>
<td>SD</td>
<td>5.70</td>
<td>7.93</td>
<td>12.93</td>
</tr>
</tbody>
</table>

Sem 2

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Online tests</th>
<th>Essay</th>
<th>Overall score</th>
</tr>
</thead>
<tbody>
<tr>
<td>median</td>
<td>29.5</td>
<td>35</td>
<td>63.5</td>
</tr>
<tr>
<td>mean</td>
<td>29.54</td>
<td>33.85</td>
<td>62.68</td>
</tr>
<tr>
<td>SD</td>
<td>4.54</td>
<td>7.88</td>
<td>11.13</td>
</tr>
</tbody>
</table>

BUSM 4192 Introduction to Management (Singapore) – Semester One 2014

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Online tests</th>
<th>Group report</th>
<th>Exam</th>
<th>Overall score</th>
</tr>
</thead>
<tbody>
<tr>
<td>median</td>
<td>24</td>
<td>20</td>
<td>19</td>
<td>62.5</td>
</tr>
<tr>
<td>mean</td>
<td>23.71</td>
<td>19.73</td>
<td>18.57</td>
<td>62.37</td>
</tr>
<tr>
<td>SD</td>
<td>3.14</td>
<td>3.03</td>
<td>4.04</td>
<td>6.471</td>
</tr>
</tbody>
</table>
In all three courses, Introduction to Management in Melbourne, Introduction to Management in Singapore and Leading for Change in Singapore, students performed better in the post-exposure cohorts (semester 2) than students in the pre-exposure cohort (semester 1).

The magnitude of the improvement did vary however, with the most striking improvement being an increase of 7 marks in the mean overall score for students in the Singapore offering of Introduction to Management.

This course also happened to have the most “intense” support for a variety of logistical reasons. It is also typically one of the first courses that students undertake in their RMIT undergraduate career. Students unfamiliar with tertiary study, independent work and critical thinking might be expected to demonstrate a bigger improvement in performance in this course compared to Leading for Change which is typically taken in the final semester of the undergraduate degree.

### 3.2.6 Students’ evaluation of course delivery

Students who are offered support in the development of their research skills and whose assessment task rubrics incorporate the RSD framework expectations might be expected to rate their course more favourably.
The research team requested data from the Course Evaluation Survey process for the courses involved in the project. At the time of writing only the Melbourne CES data was available for both pre and post exposure semesters.

The following tables detail the shift in key CES data elements.

**BUSM 4176 Introduction to Management (Melbourne)**

<table>
<thead>
<tr>
<th>Semester</th>
<th>GTS</th>
<th>OSI</th>
<th>GTS questions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Q1</td>
<td>Q2</td>
<td>Q3</td>
</tr>
<tr>
<td>1, 2014 (pre-exposure)</td>
<td>61.3</td>
<td>60.6</td>
<td>68</td>
</tr>
<tr>
<td>2, 2014 (post-exposure)</td>
<td>72.0</td>
<td>71.1</td>
<td>76</td>
</tr>
</tbody>
</table>

**BUSM 4192 Introduction to Management (Singapore)**

<table>
<thead>
<tr>
<th>Semester</th>
<th>GTS</th>
<th>OSI</th>
<th>GTS questions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Q1</td>
<td>Q2</td>
<td>Q3</td>
</tr>
<tr>
<td>1, 2014 (pre-exposure)</td>
<td>77.3</td>
<td>79.8</td>
<td>86</td>
</tr>
<tr>
<td>2, 2014 (post-exposure)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**BUSM 4194 Leading for Change (Singapore)**

<table>
<thead>
<tr>
<th>Semester</th>
<th>GTS</th>
<th>OSI</th>
<th>GTS questions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Q1</td>
<td>Q2</td>
<td>Q3</td>
</tr>
<tr>
<td>1, 2014 (pre-exposure)</td>
<td>69.8</td>
<td>75.9</td>
<td>76</td>
</tr>
<tr>
<td>2, 2014 (post-exposure)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Both GTS and OSI increased substantially from the pre-exposure to post-exposure cohort for the course BUSM 4176 Introduction to Management (Melbourne offering).

Significantly there was a 20 point jump in Question 6 (The staff put a lot of time into commenting on my work).
Although the cause of this change is multifactorial, two observations volunteered by members of the course delivery team are thought to have been influential:

- The RSD framework afforded greater clarity in expectations of the depth of research required for assessment tasks.
- Enhanced understanding of the quality of cited literature in essays gave students and assessors a common framework within which to evaluate this aspect of submitted work.

### 3.2.7 Student uptake of offered interventions

Sections 3.2.1 to 3.2.6 above have detailed changes in performance as a result of the interventions deployed by this project at the “whole of course population” level of analysis.

Student behaviour is, however, quite varied and an averaging of response may mask some underlying differences.

The project team looked at individual student access patterns for the various interventions deployed.

This was achieved largely through Blackboard analytics, where individual students accessing a particular folder or item were counted.

Blackboard access analytics should be broadly representative of student access to learning objects and interventions but will under-represent student exposure to resources in the following circumstances:

- Blackboard resources opened by the lecturer in the classroom
- Resources accessed by students directly from other sources (e.g. Library web page).

Conversely, it cannot be assumed that when students open a folder or item in Blackboard that they follow through with an exploration of that folder / item.

To gain an appreciation of access patterns, the research team reviewed student access to the course BUSM 4192 Introduction to Management in semester 2. This course was selected because one of the research team members (IW) coordinated this course.

The following graphics and commentary address this issue. Although not included as a formal “hypothesis” in the study, the information is quite valuable in understanding how support structures offered to students are taken up.

This table details the number of times students have accessed the course folder:

<table>
<thead>
<tr>
<th>Blackboard folder</th>
<th>Overall access</th>
<th>Library sub-folder access</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intensive workshop</td>
<td>12644</td>
<td>114</td>
</tr>
<tr>
<td>Topic 1</td>
<td>4777</td>
<td>419</td>
</tr>
<tr>
<td>Topic 2</td>
<td>4677</td>
<td>417</td>
</tr>
<tr>
<td>Topic 3</td>
<td>4783</td>
<td>418</td>
</tr>
<tr>
<td>Topic 4</td>
<td>4850</td>
<td>349 *</td>
</tr>
<tr>
<td>Topic 5</td>
<td>4837</td>
<td>421</td>
</tr>
</tbody>
</table>
Integration of the Research Skills Development Framework and Blackboard-mediated synchronous library research skills training modules to enhance student research skills in an undergraduate program

<table>
<thead>
<tr>
<th>Topic</th>
<th>Hits</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topic 6</td>
<td>4789</td>
<td>408</td>
</tr>
<tr>
<td>Topic 7</td>
<td>4695</td>
<td>349 *</td>
</tr>
<tr>
<td>Topic 8</td>
<td>4654</td>
<td>282</td>
</tr>
<tr>
<td>Topic 9</td>
<td>4755</td>
<td>349 *</td>
</tr>
<tr>
<td>total</td>
<td>55461</td>
<td>3526</td>
</tr>
</tbody>
</table>

* Library folder tracking was not activated for these topics so the mean number of hits across other topics was applied.

The main message from this information is that students are accessing the library folder (and therefore the research skill interventions) at a ratio of about one in ten of overall topic information access. This may well be appropriate as one “exposure” to a research skill activity may equip students with that skill.

The following graphics offer more detail on the specific access patterns to Blackboard content using the following examples:

Intensive workshop folder (a collection of resources used by the visiting lecturers in the first three sessions of the course)

Topic 1 - delivered by the visiting lecturers
Topic 6 - delivered by the local Singapore lecturers.

![Graphs showing access patterns](image-url)
Blackboard analytics has revealed some interesting patterns in the ways students access resources. There is evidence of a “just in time” approach to retrieving information when referenced to topic and to assessment task due date.
3.3 Issues and barriers

3.3.1 Assessment tasks differ by campus
Issue: Variations in course delivery approach across campuses result in different assessment approaches. For example, the course Introduction to Management has an essay as the final major task in Melbourne but an exam as the final task in Singapore.

Strategy: Identify common tasks within course offerings and / or devise analysis tools that can accommodate comparison across differing assessment tasks.

3.3.2 Delivery approaches differed
For both Introduction to Management and Leading for Change, there is a nine hour “intensive” introduction to the courses delivered by Melbourne-based staff.
This intensive focussed heavily on assessment tasks.
Students began working on assessment tasks during the intensive and received considerable feedback on their intended approaches.
In Melbourne and Vietnam, there was a more incremental approach to assessment task exploration

Strategy: The timing of administration of the student survey was adjusted on each campus to ensure that students had reached a similar level of “assessment task support” when taking the survey.

3.3.3 Use of Blackboard varied
Issue: There are significant differences in the extent to which Blackboard is a “central hub” for resources.
In Singapore, where there are weekly 3 hour classes, no discreet tutorials and over 150 students per class, the course Blackboard became the key information sharing / resource point, whereas in Melbourne, the course tutors fulfilled that role in the weekly tutorial classes

Strategy: Varying “centrality” of Blackboard reduces the reliability of Blackboard analytics as a measure of student access to course resources
(e.g. students viewing a Blackboard folder / item opened in a tutorial class may not necessarily open the folder on their own device, reducing the number of “hits” recorded.

3.3.4 High level of (local) autonomy across delivery sites
Strategy: Introduction of Course Management Teams has assisted in the harmonisation of course delivery across locations and programs but there still remains considerable local variation.
Both courses are characterised by large enrolments and multiple simultaneous delivery by a team of deliverers.
For example, in Singapore the Introduction to Management course was delivered as five concurrent classes (four full time classes and one part time class) by four lecturers.
Each lecturer had a particular style and approach which significantly influenced class behaviour.
The relationship between Melbourne coordinators and Singapore delivery staff is similar to that of coordinator - tutor, whereas in Vietnam, the delivery staff have a much more central role in course design.

3.3.5 Differing value / perception of librarian role in course delivery
Issue: The research team noted considerable variation in attitude towards and inclusion of librarians in course delivery. There was a diversity of views on the benefit of librarian input in class delivery - ranging from “absolutely essential” to “would be good but there isn't enough free time”.

RMIT UNIVERSITY
Conversely, the RMIT Library was reluctant to commit to “servicing” every tutorial because of the huge resource implications this would entail.

**Strategy:** The project team affirmed the central role of librarians in developing students’ information literacy and the principle of equality of access to library services.

This led the team to focus the librarian interventions at Blackboard level with support structures built for lecturing staff.

Each topic in the respective Blackboard sites had a set of library resources and hyperlinks to central library services such as the “Ask a Librarian” service, the course subject guide and appropriate databases.

Library support was more “intense” around the times of assessment task due dates.

The “Ask a Librarian” service staff were supported at these times with copies of assessment task guides and a range of FAQs developed by the School’s liaison librarian.

Additionally “drop-in clinics” were established on the Melbourne campus to serve a “just in time” function for small groups of students seeking topic research and information gathering help.

### 3.3.6 Anxiety over “technology failure”

**Strategy:** The project adopted standard software platforms and a consistent Blackboard approach

### 3.3.7 Expectations of involvement of sessional staff

**Issue:** Sessional staff input beyond allocated class delivery times is unfunded. This was an issue on the Melbourne and Singapore campuses where sessional staff constitutes a very significant portion of the course delivery workforce.

**Strategy:** The project budget included resourcing sessional staff to attend a project workshop but not for any additional need that became evident during the project. Whilst sessional staff are generally very generous with their time the project team was reluctant to draw too much on unpaid time. Whereas full time staff might be expected to carry through with emerging issues, the same could not be expected of sessionals.

### 3.3.8 Introduction to Management is a large and complex course

**Issue:** The very large numbers of students enrolled in Introduction to Management (approximately 5000 per year) required multiple concurrent classes in each location complicating access to students.

For example, on the Melbourne campus there were over 50 tutorial classes in both semesters and in Singapore there were seven lecture cohorts running concurrently.

**Strategy:** For the Melbourne campus students, project communications and interventions were managed at the course Blackboard level while in Singapore the focus was at lecture cohort level because lectures were not always delivered in the same week.

### 3.3.9 Broader stakeholders difficult to engage

**Issue:** The project proposal included the involvement of the Study and Learning Centre (RMIT Melbourne) and the Learning Skills Unit (RMIT Vietnam) but it was difficult to achieve and maintain routine connection with these groups because of other issues competing for their available time.

**Strategy:** A re-scoping of the project goals resulted in a tighter focus on research skills delivery, and a reduced focus on the delivery of academic skills, with the result that active involvement from the SLC and LSU was not required.
3.3.10 The “theoretical / hypothetical nature of the early stages of the project

**Issue:** Early in the project, the team did not yet have well-defined “interventions” so some of the discussions with broader stakeholders were a little amorphous.

**Strategy:** As the interventions firmed up, these were explained to stakeholders and the developed interventions circulated to staff - with worked examples of how they might be deployed.

### 4 Dissemination strategies and outputs

- **Paper submission to HERDSA Annual Conference 2015, ‘Learning for life and work in a complex world’ under the sub-theme ‘Assessing, evidencing and evaluating graduate capabilities’.

- **Library web page -** The LTIF project will be taken up as a case study on a web page focusing on the Research Skill Development Framework, to be developed in 2015.

- **Library-created learning resources will be stored and made available on the RMIT Learning Repository - http://www1.rmit.edu.au/library/learningrepository.

- **Selected Library-created learning resources will be embedded into the Library iSearch tutorial -http://emedia.rmit.edu.au/isearch/ .

- **Presentations to relevant College and School committees and professional development activities. A World Cafe discussion about the project has already been held with School of Management staff at the School Planning Day.

- **Project participants will seek an opportunity to feature the project as part of RMIT Learning and Teaching Expo 2015, and to the CAVAL Reference Interest Group Information Literacy Forum in late-2015.

- **Liaison Librarians will use the project approach to advocate for the embedding of research skills into curriculum in discussion with learning designers and academic staff, and through the Global Learning by Design project.

- **LTIF Final Report will be available on the RMIT website.

### 5. Evaluation of project outcomes

#### 5.1 Evaluation framework

The project was evaluated using the OLT framework (http://www.olt.gov.au/evaluation).

The framework poses nine questions that interrogate project outcomes. Set out below are the nine OLT questions and the project team’s responses.
1. What processes were planned and what were actually put in place for the project?

Key processes table

<table>
<thead>
<tr>
<th>Process</th>
<th>Implemented?</th>
</tr>
</thead>
<tbody>
<tr>
<td>project information for stakeholders (academic staff, library, ADG)</td>
<td>yes</td>
</tr>
<tr>
<td>student and staff focus groups (first half year)</td>
<td>yes</td>
</tr>
<tr>
<td>online survey deployment and associated information</td>
<td>yes</td>
</tr>
<tr>
<td>project team meetings and development workshops</td>
<td>yes</td>
</tr>
<tr>
<td>planning workshops (Melbourne, Vietnam and Singapore)</td>
<td>yes</td>
</tr>
</tbody>
</table>

2. Were there any variations from the processes that were initially proposed, and if so, why?

All processes detailed in the project proposal were carried through with the exception of the involvement of the learning and teaching units in Vietnam and Melbourne. As noted elsewhere in this report, the project team was able to achieve the desired outcomes with less input from the learning and teaching units than was anticipated. Nevertheless the units were very helpful in guiding and framing the development of the interventions.

3. How might the project be improved?

Potentially stronger outcomes may have been realised if Melbourne sessional staff were resourced to play a greater role in the roll-out of the interventions.

Library staff on all campuses were actively involved in the project but we had less capacity to engage academic staff for the following reasons:

- Academic staff in Vietnam being on “pre-semester” leave and therefore not on campus at the time we launched the project
- Melbourne, Singapore and Vietnam semesters not aligned; leading to staggered timing of interventions and therefore a need to repeat the “education” component of intervention deployment
- Singapore delivery staff are sessionally employed and are not resourced to undertake developmental work of the kind this project entailed.

4. What were the observable short-term outcomes?

Greatly enhanced links between Library and Academic staff on all campuses.

Improvement in student performance in all key measures (hypotheses) formulated for the project.

A more inclusive Course Management Team engagement, where librarians were brought in to the planning and pre-delivery stages much more effectively.

5. To what extent have the intended outcomes been achieved?

The primary intended outcome of enhanced student performance has been achieved.

Monitoring over the coming semesters will be necessary to measure the extent to which the developments are retained. This is particularly critical as there are new course coordinators for both the Introduction to Management and Leading for change courses.
6. Were there any unintended outcomes?
No unintended outcomes were observed.

7. What factors helped and hindered in the achievement of the outcomes?

The key enabler for the project was strong communication and collaboration between the project team and the course teams in each location.

8. What measures, if any, have been put in place to promote sustainability of the project's focus and outcomes?

The project developed an implementation process for the interventions that included standardised Blackboard architecture, exemplar templates for incorporation of information literacy skills into the course curriculum and a structured approach to the use of the RSD framework in assessment task rubrics.

9. What lessons have been learned from this project and how might these be of assistance to other institutions?

Strong communication is needed when working across geographically and culturally separate campuses.

5.2 Future impact and value

This project has demonstrated that the explicit inclusion of library research skills in curriculum, supported by tailored learning resources and a skills framework, is a successful way of enhancing students' research skills. This approach has potential application for all students, across disciplines and locations. Future research skills programs should take a program-level rather than a course-level approach, so that research skill development can be taught incrementally, and mapped to the increasing complexity of course content and academic outcomes.

The project team recommends that future research skill development projects focus on developing clear research skills learning outcomes and rubrics, mapped to assessment rubrics. There is potential for significant improvement in the way library research skills, as well as academic and ICT skills, are linked to course learning outcomes and described in course guides.

The project team also recommends a future project that develops strategies to ensure RMIT students can self-assess their research skills against course outcomes and assessment requirements, and develop the necessary skills through a contextualised package of learning resources. This could be associated with the development of appropriate learning analytics to capture and report on students' information-seeking behaviours.
Appendix A

Annotated bibliography


**Keywords:** Information Literacy Standards; Research; Information literacy; Mapping.

This book is the result of a research study undertaken by librarians around the research needs of future undergraduate students. The result of the study was ‘A New Curriculum for Information Literacy’, or ANCIL. ANCIL comprises of ten standards. Most relevance to this project are stand two, three, four, eight and nine. Stand two Developing an independent learner, Stand three Developing academic literacies, Stand four, Mapping and evaluating the information landscape, Stand eight, Presenting and communicating knowledge and Standard nine, Synthesizing information and creating new knowledge.

Bent, M. and E. Stockdale (2009). "Integrating information literacy as a habit of learning-assessing the impact of a thread of IL through the curriculum." Journal of Information Literacy 3(1).

**Keywords:** Information literacy; Self-assessment; Embedded information literacy.

A similar study to ours LTIF project but undertaken at Newcastle University in the UK. Information literacy was embedded into the curriculum. Data, including student self-assessments of skills, discussion group transcripts, learning logs were then analyses to assess effectiveness of the process. The paper concludes that embedding information literacy into a curriculum was an effective model in which to skilling students and create general awareness of information literacy concepts.


**Keywords:** Information literacy; Embedded information literacy; Online; Student engagement; Collaboration.

The authors undertook an embedded online project similar to our LTIF project to combat large class sizes. Essentially this study compared a generic information literacy offering with a more subject specific tailored online module utilizing technology for better student engagement. The tailored version was the result of an academic / librarian collaboration. As in our project.


**Keywords:** Literature review; Student engagement; Framework; RSDF.

The author provides a deep analysis of the literature around student engagement and frameworks for student research. The relationship between teaching and research is discussed in some detail. The research skills development framework, RSD, used in our study, is also discussed in the wider context of frameworks for research and inquiry.


**Keywords:** Collaboration; Information literacy; Pedagogy; Online learning objects (OLO).
This article is interesting in that it provides an account of a librarian / faculty member collaboration around addressing information literacy deficiencies within a research methods course. As with our study, student’s skills are assessed prior to the implementation of interventions.

The article concludes that ‘…collaboration with the librarian has served to improve aspects of pedagogy to better support student’s needs.’ It also states that, ‘evaluation of student assignments has permitted …[the academic] to suggest new areas in which the librarian should develop instructional support tools.’ Thereby providing an example of a successful faculty / librarian collaboration on which to model our own.


Keywords: Online learning objects (OLO); Reusable learning objects (RLO); Information literacy.

Discusses information literacy related reusable learning objects (IL RLO’s) the creation of and the decided lack of sharing being undertaken throughout the industry. Even though such resources are generally designed with re use in mind. Discusses why and the issues involved with altering this mindset.


Keywords: Self-assessment; Information literacy.

Discusses student’s self-perceptions around their own information literacy capabilities. It concludes that students usually self-assess their own information literacy skills incorrectly and above their actual abilities. This article discusses the need for an overarching skills assessment test which is not linked to a particular course of study or to a particular educational facility. Various existing tests are discussed here.

Overall results from various studies allow authors to conclude that as a rule, students enrol in high education with no or low information literacy skills. Even those with skills tend to score on the lower end of the scale.


Keywords: Self-assessment; Information literacy.

This study compares the relationship between student confidence in their research abilities and students actual research capabilities. This article concludes that students generally over assess their abilities.


Keywords: Rubric; Information literacy; Standardized assessment; Norming.

The need to use a rubric in information literacy training is discussed but the main point of the article is the discussion around the need for and practicalities of undertaking a ‘norming’ process for standardizing application of the rubric across different markers.

**Keywords:** Collaboration; Information literacy; Literature; Framework.

Discusses aspects involved with the successful working collaboration between academic and library staff in development of an information literacy program at Wellington University. The study first established a shared understanding derived from the literature of the definition of information literacy between the two groups. A model of collaboration was also chosen again from the literature, to be used as a framework for the study. Participants in the study were interviewed using questions which covered the definitions of information literacy, the collaboration as well as perceived teaching responsibilities. The main barriers appear to have been perceived status of librarians regarding teaching responsibilities.


**Keywords:** Rubric; Information literacy; Literature; Information literacy standards.

Discusses the implementation of a rubric as an assessment tool for information literacy instruction at Carleton College in Minnesota. Further literature sourced for this study concluded that the alignment of such rubrics with IL standards such as ACRL Standards strengthens effectiveness.


**Keywords:** Information literacy standards; Information literacy; Online.

A qualitative case study reporting on the effectiveness of aligning the ACRL's Information Literacy Competency Standards for Higher Education (U.S) with various Web 2.0 tools used in an online information literacy instruction course. The article concludes that such an alignment is most effective and the choice of tool chosen is of importance to effectiveness.


**Keywords:** Information literacy; Libguides; Learning management system (LMS); Embedded.

This study concludes that library resources, in this instance Library guides, were found to be useful by students when they used them. It also questions the ease of locating such guides when embedded in a LMS.


**Keywords:** Student feedback; Self-assessment; Information literacy.

Discussion around the model for providing feedback to students and proposes a self-assessment alternative for students.


**Keywords:** Framework; Mapping; Framework; Information literacy; RSD.
Integration of the Research Skills Development Framework and Blackboard-mediated synchronous library research skills training modules to enhance student research skills in an undergraduate program

This was the actual framework utilized within the LTIF project to align the resources created and map student information literacy development throughout the semester of each course. Apart from the actual framework the website provides examples of implementation across different subject area, plus much associated support material.


**Keywords:** Self-assessment; Information literacy; RSD, Framework.

This study aligns the LTIF project as it utilizes pre and post course student self-assessment questionnaires across two institutions to ascertain student attitudes to the importance of information literacy. It also utilizes the RDS Framework as our LTIF project does.


**Keywords:** RSDF; Framework.

Discusses implementation of the RSDF on which our project is based. This article was most useful.


**Keywords:** Information literacy; Professional development; Collaboration; Literature.

The focus of this article is twofold. It’s primarily about upskilling subject librarians in pedagogical practice for more effective promotion of information literacy to academic staff at the University of Auckland. Its secondary focus, of interest to this project, was the development of a programme for subject librarians which focuses on practical aspects of promoting information literacy for integrating into the curriculum. Useful discussions around the collaborative nature of the relationship between librarian and academic staff is included. The literature review within this article was also most useful.