JIBC Student Research Skills Development Framework

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INTRODUCTION

The purpose of this work was to examine the contribution of student research to learning and student success, and outline a student Research Skills Development Framework (RSDF) for the Justice Institute of British Columbia to use to guide the research skills development of their students. Recommendations for appropriate student research projects at each of the course and diploma and baccalaureate levels are presented. These recommendations are informed by the conceptual model developed by Willison and O'Regan (2006, 2007) – the Research Skills Development Framework – that incorporates "six facets of research skills into a continuum of student autonomy in the conduct of research" (Willison, 2009, p10).

BACKGROUND

The aim of an undergraduate research experience is to develop students' understanding of, and skills and abilities to carry out, research. Yet, defining undergraduate research remains elusive, with the term being used loosely for a wide range of varying experiential learning opportunities. Childs et al. (2007) provided an inclusive definition of undergraduate research as "student engagement from induction to graduation, individually and in groups, in research and inquiry into disciplinary, professional and community-based problems and issues, including involvement in knowledge exchange activities" (Childs *et al.*, 2007). The skills developed through undergraduate research, and benefits reported in the literature are reported in the two tables. Data confirms that JIBC's commitment to a RSDF is a worthy endeavor.

Most frequently cited skills developed through research participation.

Stewart (2010)	Behar-Horenstein and Johnson (2010)
Communication (both oral and written)	communication skills
Search strategies (library, web and others)	
Critical thinking/analysis	problem solving skills and creative-thinking skills
Lab and field skills	increased technical skills,
Understanding how research is done in the discipline	
Developing a research question	
Becoming independent	independent work habits
Becoming part of a research community	
Understanding research processes and methods	
Developing teamwork skills	teamwork and collaboration
Understanding the primary literature	
Persistence and tolerance for obstacles	learning to deal with ambiguity and obstacles
	increased self confidence

Benefits of undergraduate research.

Reference	Benefits of Undergraduate Research
Reisberg (1998)	researching was more exciting and academically rewarding than lecture-based approaches to teaching and learning
Dominick et al. (2000)	students gained a deeper understanding for their subject matter through research activities'
Ishiyama (2002)	Students gained the ability to analyse and synthesise ideas and to work independently
Jonte-Pace (2003)	undergraduate student research enabled staff to move forward with their own research agenda
Bauer &Bennett, 2003	undergraduate students engaged in research reported higher motivation to study than other students
Ward, Bennett and Bauer (2003)	students perceived that engaging in research facilitated learning to a greater extent than traditional courses
Seymour et al. (2004)	skill and attitude-based benefits of undergraduate research exposure included personal/professional gains, improved thinking as a scientist, clarification or confirmation of career plans and enhanced career/graduate studies preparation
Lopatto, 2004	better understanding of how research is done, and improved laboratory and field skills
Carter, 2009	the intensity of the undergraduate research experience was correlated to the student's decision to complete a PhD
Healy & Jenkins, 2009	Improved search strategies (including, library, web, and database searching)
Behar-Horenstein & Johnson, 2010	developing responsibility for one's own learning
Willison, 2012	students clearly perceived that they developed discipline-specific research skills and that these were useful for current or projected employment as well as for subsequent studies

Willison and O'Regan (2009) promote the Research Skill Development Framework (RSDF) as a tool to help address "the lack of a conceptual framework from which to conceptualise undergraduate research across all disciplines" (Willison & O'Regan, 2009, p. 394). It was their firm belief that "a holistic, consistent, explicit approach to developing research skills" (Willison & O'Regan, 2009, p. 394, 398) would be of benefit to all those involved in the teaching and learning processes, including instructional designers, library staff, faculty and students' awareness of the process of research skill development" (Willison & O'Regan, 2009, p. 404). JIBC's adoption of a framework, while recognizing previous work, recognizes our unique educational niche, and focuses on the undergraduate experience.

> *I am neither especially clever nor especially gifted. I am only very, very curious. " Albert Einstein*

THE MODEL

The facets of research skill development can be viewed through a lens of Bloom's Taxonomy to demonstrate that students move along a continuum that includes:

"**embark** on inquiry and so determine a need for knowledge/ understanding.
 find/generate needed information/data using appropriate methodology.
 critically evaluate information/data and the process to find/generate this information/data.
 organise information collected/generated.
 synthesise and **analyse** and **apply** new knowledge.
 communicate knowledge and the processes used to generate it, with an awareness of ethical, social and cultural issues"   https://www.adelaide.edu.au/rsd

	Course-Based Assignments	Lower Level Capstone	Upper Level Capstone
	Prescribed Research Highly structured directions and modelling from educator prompt student research	Bounded Research Boundaries set by and limited directions from educator channel student research	Scaffolded Research Guided structure from the program area and the lead faculty shapes independent student research.
Embark & Clarify	Respond to questions/tasks arising explicitly from a closed inquiry. Use a provided structured approach to clarify questions, terms, requirements and expectations.	Respond to questions/tasks required by and implicit in a closed inquiry. Choose from several provided structures to clarify questions, terms, requirements and expectations.	Generate questions/aims hypothese within structured guidelines. Choose a range of provided structures or approaches to clarify questions, terms, requirements and expectations.
Find & Generate	Collect and record required information or data using a prescribed methodology from a prescribed source in which the information/data is clearly evident.	Collect and record required information/data from self-selected sources using one of several prescribed methodologies.	Collect and record required information/data from self-selected sources using one of several prescribed methodologies.
Evaluate & Reflect	Evaluate information/data and reflects on inquiry process using simple prescribed criteria.	Evaluate information/data and inquiry process using criteria related to the aims of the inquiry. Reflect insightfully to improve own processes used.	Evaluate information/data and inquiry process using criteria related to the aims of the inquiry. Reflect insightfully to improve own processes used.
Organize & Manage	Organize information/data using prescribed structure. Manage linear process provided.	Organize information/data using a choice of given structures. Manage a process which has alternative pathways.	Organize information/data using recommended structures, with some student-determined choice of structures. Manage self-determined research process with multiple possible pathways within the parameters set by the structures.
Analyze & Synthesize	Analyze and synthesize information/data to reproduce existing knowledge in prescribed formats. *Ask emergent questions of clarification/curiosity*.	Analyze and synthesize information/data to reorganize existing knowledge in standard formats. *Ask relevant, researchable questions emerging from the research*.	Analyze and synthesize information/data to construct emergent knowledge. *Ask rigorous, researchable questions based on new understandings*.
Communicate & Apply	Use mainly lay language and prescribed genre to demonstrate understanding for lecturer/ teacher as audience. Apply to a similar context the knowledge developed. Follow prompts on ESC issues.	Use some discipline-specific language and prescribed genre to demonstrate understanding from a stated perspective and for a specified audience. Apply to different contexts the knowledge developed. Specify ESC issues.	Use discipline-specific language and genres to demonstrate scholarly understanding for a specified audience. Apply the knowledge developed to diverse contexts. Specify ESC issues in initiating, conducting, and communicating the research.

KEY REFERENCES
Childs P, et al.,(2007) *Leading, promoting and supporting undergraduate research in the new university sector* (National Teaching Fellowship Project www.heacademy.ac.uk/projects/detail/ntfsproject_universityofgloucestershire)
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