



Research Immersion Program

Bonus Rank Program



Contents

| | |
|---|----|
| Introduction : The SPARQ-ed Bonus Rank Program | 3 |
| The Bonus Rank Program Portfolio | 4 |
| Pre-Program Activity 1 : Application | 5 |
| Pre-Program Activity 2 : Literature Review | 6 |
| In Program Activities | 8 |
| Post-Program Activity : Scientific Research Paper | 9 |
| Appendices : | |
| Appendix A : Application Form for Research Immersion Program | 11 |
| Appendix B : SPARQ-ed Bonus Rank Program Portfolio Checklist | 16 |
| Appendix C : SPARQ-ed Bonus Rank Program Literature Review Assessment Criteria | 18 |
| Appendix D : SPARQ-ed Bonus Rank Program In-Program Activity Checklist ... | 18 |
| Appendix E : SPARQ-ed Journal Instructions to Authors | 19 |
| Appendix F : SPARQ-ed Bonus Rank Program Research Paper Review Criteria . | 20 |

Introduction : The SPARQ-ed Bonus Rank Program

The SPARQ-ed research immersion programs are designed to provide senior school students with an immersive scientific research experience. Participants in the programs undertake an experimental project which has been designed by one of UQDI's world-ranked biomedical research groups. At their option, students may elect to complete an additional program which earns them a bonus point under the University of Queensland Bonus Rank Scheme (see <http://www.uq.edu.au/study/?page=86632> for more information on this scheme).

What is a Bonus Rank ?

Bonus ranks are entry ranks. A Queensland student's overall position (OP) is converted to the QTAC 1-99 University entry rank scale to which the bonus points are applied. The student is then considered for admission to UQ on the basis of the new rank. The OP-to-rank conversion is subject to change each year, depending on the achievement patterns of the Year 12 cohort. QTAC determines points of comparison between OPs and entry ranks each year so that equitable selection on the basis of merit for all applicants can occur. For further details visit the QTAC website at <http://www.qtac.edu.au/Applying-CurrentYr12/InterstateAdmissions.html>.

What does the Program Involve ?

SPARQ-ed research immersion programs are intensive five-day biomedical science enrichment activities. They are based around an experimental project which has the potential to contribute to the work done by UQDI's world ranked research groups in the fields of cancer, immunology and genetics. The programs also include opportunities for participants to attend cutting edge biomedical research seminars and feature tutorials aimed at developing skills in academic research and science communication. The programs culminate in a closing symposium in which participants present the results of their research to the staff and students of UQDI. More information on the research immersion programs can be found at <http://www.di.uq.edu.au/sparqed-rip>.

The elements of the Bonus Rank program reflect the authentic nature of the research immersion programs. Each element is based on important aspects and responsibilities of research scientists in their work. Evidence of participation in each of these activities is collected into a portfolio which is used to assess the participant's suitability to receive a bonus point under the bonus rank scheme.

The Bonus Rank Program Portfolio

The SPARQ-ed Bonus Rank Program consists of three stages :

- Pre-program activities :
 - Completion of application form
 - Literature Review
- In-program activities :
 - Attendance at research immersion program project sessions and maintenance of a lab journal
 - Attendance at research seminars
 - Attendance at tutorials
 - Production and delivery of the closing symposium based on project undertaken
- Post-program activities :
 - Production of a scientific research article based on the project work that they completed during the program

A portfolio checklist is provided as Appendix B.

The following pages contain detailed explanations of what participants have to do to attain a pass in each of the activities.

Pre-Program Activity 1 : Application

Summary of Activity : In order to take part in a SPARQ-ed Research Immersion Program, participants need to complete an application and submit it through their school.

Explanation of Task :

- Complete the form for nomination for a SPARQ-ed Research Immersion Program. A copy of this form can be found in Appendix A of this document.

- This form consists of a number of components :
 - Personal details section
 - Academic results – concentrate on subjects which are relevant to science.
 - Personal Statement – in assessing this section, the panel will be looking for :
 - Teamwork skills
 - Initiative and ability for self-directed learning
 - Leadership skills and aspirations
 - An interest in science
 - A desire to pursue a career in science

In each of these criteria, cases where you can give examples of how participants fulfill them will be graded more highly

- Prior experience with science engagement activities (eg. work experience, Science and Engineering Challenge, etc). Remember that some of these activities may be used as evidence for the criteria in the personal statement.

Suggested Timeframe : 2 hours

Due Date : These materials must be submitted to the SPARQ-ed Office by no later than two weeks prior to the commencement of the program. Later submission can be negotiated in extraordinary circumstances with the SPARQ-ed Coordinator. The SPARQ-ed coordinator will retain these materials in the portfolio.

Evidence of Attainment : Application completed by applicant, signed by school Principal (or delegate) and approved by SPARQ-ed Application Review Panel, consisting of the SPARQ-ed Coordinator, academic member of SPARQ-ed Reference Group and teacher member of SPARQ-ed Reference Group.

Pre-Program Activity 2 : Literature Review

Summary of Activity : Participants complete a 1000wd review of the literature relevant to the project they are undertaking.

Explanation of Task :

The literature review is a critical analysis of the published knowledge concerning the theoretical basis of the project undertaken. It is intended to introduce the reader to the background behind the project and may serve as the basis for the introduction to the final scientific paper submitted after the program. Students are encouraged to use the introduction to their project manual and the included references as a starting point to writing their literature review.

The literature review should be based on between two and five references from reputable sources. Prior to completing the program (particularly the library research tutorial) access to peer-reviewed scientific journals may be limited, however participants should endeavour to use reliable sources of information (that means no Wikipedia). These sources must be referenced in text using an appropriate bibliographic format (see the Style Guide for the scientific paper component of your portfolio, provided as Appendix E).

The literature review should include discussion of the current knowledge in the field from which the project is derived, including any debate or controversy which may exist. Ideally, the literature review should mention gaps in the published knowledge which should lead to the aim of the project undertaken and the hypothesis.

The literature review should be written in around 1000 words. Significantly less than this target means that it is unlikely that the topic has been explored in sufficient depth. Writing concisely is a scientific skill, so literature reviews significantly in excess of this word limit may be going into too much detail.

Participants should treat the literature review as a first draft of the introduction for the scientific paper. The assessors will provide useful feedback which should be incorporated into the final draft. It is expected that the references used may change after appropriate library research skills have been developed during the course of the program.

The assessment criteria for the literature review are provided as Appendix C.

The following sites contain useful information about writing literature reviews. Please note that these have been written with post-graduate students writing their theses in mind, so while the basic approach described should be followed, the standards placed on participants' work will not be as demanding.

<http://www.uq.edu.au/student-services/phdwriting/phlink18.html>

<http://www.canberra.edu.au/studyskills/writing/literature>

https://www.dlsweb.rmit.edu.au/lisu/content/2_assessmenttasks/assess_tuts/lit_review_LL/index.html

Suggested Timeframe : The amount of time required to research and write the literature review will vary according to the topic, and the availability of references, however participants should aim to spend less than 10 hours on this component.

Due Date : The literature review must be submitted in hardcopy or electronic (Microsoft Word compatible) format to the SPARQ-ed Coordinator on the first day of the program. Later submissions may be negotiated, however these may impact on the time that reviewed copies are returned.

Evidence of Attainment : Completed 1000wd review of the literature relevant to the project undertaken, reviewed by the SPARQ-ed Coordinator and the contributing researcher (or delegate).

In Program Activities

Summary of Activity : Students attend all sessions of the research immersion program and complete a log which details these activities

Explanation of Task : Over the course of the research immersion program, students will take part in a number of activities. Each of these needs to be documented by the student and recorded in a research log. This log is signed on each day by the SPARQ-ed Coordinator. The log is best documented in a hard copy form - a notebook or exercise book is suitable for this purpose, reflecting the laboratory day books that research students and staff keep. This should be separate to the laboratory manual that students are given at the commencement of the program. The components which need to be documented are listed below alongside items which should be included :

| Item | Suggested Documentation |
|---|--|
| Laboratory Sessions | <ul style="list-style-type: none">• Descriptions of any changes made to protocols followed• Observations and tables of results• Notes taken during discussions with the Coordinator, contributing researcher or tutors |
| Research Seminars (Tuesday Lunchtime and/or Friday Forum) | <ul style="list-style-type: none">• Name of the presentation and presenter• Notes taken during the course of the presentation• Questions you would like to ask the presenter about the topic• Reflections on the work presented |
| Library Research Tutorial | <ul style="list-style-type: none">• Copies of the activities performed• Bibliographic details of at least one peer-reviewed journal article relevant to your project |
| Science Communication Tutorial | <ul style="list-style-type: none">• Reflections on the topics covered in the tutorial |
| Closing Symposium | <ul style="list-style-type: none">• Detailed notes on your contribution to the presentation• An electronic copy of the presentation |

A checklist to keep track of these activities is provided as Appendix D

Suggested Timeframe : These activities are conducted over the course of the research immersion program (five consecutive days).

Due Date : The log should be submitted to the SPARQ-ed Coordinator on the final day of the program.

Evidence of Attainment : A satisfactorily completed activity log with each component signed off by the SPARQ-ed Coordinator or tutor(s). Upon request, a photocopy of the log will be made available to the student to assist in the completion of subsequent activities.

Post-Program Activity : Scientific Research Paper

Summary of Activity : Students produce a 2500wd scientific paper which details the findings of their project. After a process of peer review by an editorial board, suitable papers may be published in the online “SPARQ-ed Journal”.

Explanation of Task :

Publication in peer reviewed scientific journals is an important component of the life of a scientist. Journal articles represent the main way that the work of scientists is communicated to their peers and the wider community. The body of published research provides a valuable resource for scientists working in particular field, whether it be to provide them with the background to the area in which they are working, or procedures and protocols they can use and modify in the laboratory.

The normal process for publication involves a scientist submitting a manuscript to a relevant journal which details their research findings and the procedures followed. This manuscript is then sent to a panel of anonymous editors which are recognized as experts in the field (ie. “peers” of the scientist) who review it and suggest modifications or further experiments which need to be performed to confirm the scientist’s conclusions. Once agreement has been reached, the paper is published in the journal. This process of peer review establishes the reliability of the work and places journal articles amongst the most trusted form of scientific information.

In this task participants will prepare a scientific paper for publication in the online *SPARQ-ed Journal* according to that journal’s style guide. The paper will be reviewed by an editorial panel and then returned with suggestions for improvement. Once corrections have been made, the paper will be given a grade (suitable or not suitable for publication) and suitable papers will be published in the online journal.

The paper should consist of the following :

- Title
- List of Authors (with the participants as lead author and the other students in the group as co-authors)
- An abstract – a short (50-100wds) summary of the paper which includes a brief description of the theoretical basis of the work, the results achieved and the conclusions drawn.

- An introduction (~1000wds) which outlines the theoretical basis of the project undertaken. The literature review can be used as the basis for this introduction. The introduction should conclude with the aim of the project and hypothesis.
- Materials and Methods section – detailing the materials used and the protocols followed. These will be drawn from the protocols outlined in the manual, however any changes to the protocols which arose during the project should be included here.
- Results section – this section lists the experimental results you recorded. It should largely consist of summary tables, graphs and figures. There should be no discussion of the significance of the results.
- Discussion section (~1000wds) – this section includes the discussion of the results, including any problems with the procedures which may have had impact on them.
- Conclusion – a brief recap of the findings which refers to whether the hypothesis was proved or disproved. The conclusion may also contain suggestions for improvements to the method or to further research which should be done.
- Acknowledgements – a brief statement acknowledging anyone others not in the author list who assisted in the project or the production of the paper.
- Reference list – containing bibliographic details of all the materials used in the production of the paper.
- Appendices (if required) – containing any additional data tables, photographs or figures which contributed to the results.

Please refer to the *SPARQ-ed Journal* Guide to Authors (Appendix E) for guidelines on how to present the paper.

The assessment criteria for this component are provided as Appendix F.

Suggested Timeframe : Timeframes will vary between students and projects, however participants should not spend more than 20 hours on this component.

Due Date : The first draft of the manuscript should be submitted to the SPARQ-ed office no later than three weeks after the completion of the project. Corrections should be made within one week of receiving feedback from the editorial panel.

Evidence of Attainment : A paper approved by the editorial board published in the online *SPARQ-ed Journal*.

Appendix A : Application Form for Research Immersion Program

Section 1 – Personal Information

| | |
|---|--|
| Name : | |
| Date of Birth : | Gender : Male <input type="radio"/> Female <input type="radio"/> |
| School Attended : | Year Level : |
| School Address : | |
| School Staff Contact : Name _____ Email _____ | |
| School Phone : | School Fax : |
| State School <input type="radio"/> Non-Government School <input type="radio"/> | Metropolitan <input type="radio"/> Regional <input type="radio"/> Remote <input type="radio"/> |
| My preference would be to undertake the program in (tick as applicable) : | |
| Term 1 <input type="radio"/> Term 2 <input type="radio"/> June Vac. <input type="radio"/> Term 3 <input type="radio"/> Sep Vac. <input type="radio"/> Term 4 <input type="radio"/> Nov. Vac <input type="radio"/> | |
| Parent / Guardian Name : | |
| Home Address : | |
| I hereby give permission for my student to take part in the SPARQ-ed Research Immersion Program | |
| Signed : _____ Date : _____ | |
| Home Phone : | Parent / Guardian Email : |
| Parent / Guardian Mobile Phone : | |
| I wish to identify as : | |
| Aborigine <input type="radio"/> Torres Strait Islander <input type="radio"/> From a Non-English Speaking Background <input type="radio"/> | |

Section 2 : Student Academic Results (Science Relevant Subjects Only)

| | | |
|------------------|----------------------|--------------------|
| Subject : | Year Studied : | Semesters : |
| Grade Achieved : | Position in Cohort : | Number in Cohort : |

| | | |
|------------------|----------------------|--------------------|
| Subject : | Year Studied : | Semesters : |
| Grade Achieved : | Position in Cohort : | Number in Cohort : |

| | | |
|------------------|----------------------|--------------------|
| Subject : | Year Studied : | Semesters : |
| Grade Achieved : | Position in Cohort : | Number in Cohort : |

| | | |
|------------------|----------------------|--------------------|
| Subject : | Year Studied : | Semesters : |
| Grade Achieved : | Position in Cohort : | Number in Cohort : |

| | | |
|------------------|----------------------|--------------------|
| Subject : | Year Studied : | Semesters : |
| Grade Achieved : | Position in Cohort : | Number in Cohort : |

Section 3 : SPARQ-ed Bonus Rank Program (Optional)

The SPARQ-ed Bonus Rank Program allows participants in the research immersion programs to complete an additional component which awards them a bonus point under the University of Queensland Bonus Rank Scheme. Information about this program can be found at <http://www.di.uq.edu.au/sparqbonusrank>

I have read the information about the SPARQ-ed Bonus Rank Program and am aware of the additional activities required of me. I would like to take part in this optional activity and be considered for a bonus point under the University of Queensland Bonus Rank Scheme.

Signed : _____ Dated : _____

Section 4 : Student Interest Statement (200 wds)

Please write a short statement on what qualities you can bring to the SPARQ-ed Research Immersion Program, citing examples where possible. Explain why you want to take part in the program and detail any areas of special scientific interest you may have (Please note that while every effort will be made to find a project which matches your interests, you should be prepared to work within any project which fits into the broader category of Biomedical Science Research) :

Section 5 – Activity Log

Please detail any relevant scientific experience you may have already completed. This may include part-time work, work experience, volunteer work, other science programs (eg. Siemens Summer School, Frontiers in Science lectures, Optiminds, Science & Engineering challenge, Science Competitions etc).

| | |
|---|-------------------------|
| Name of Activity | Dates Undertaken |
| Brief Description of Activity / Summary of Results | |

| | |
|---|-------------------------|
| Name of Activity | Dates Undertaken |
| Brief Description of Activity / Summary of Results | |

| | |
|---|-------------------------|
| Name of Activity | Dates Undertaken |
| Brief Description of Activity / Summary of Results | |

| | |
|---|-------------------------|
| Name of Activity | Dates Undertaken |
| Brief Description of Activity / Summary of Results | |

Section 6 – Principal’s Approval

I have read the student’s application and can verify and confirm the accuracy of the information contained within.

I support the application of _____
for participation in a SPARQ-ed Research Immersion Program

(signed Principal or Delegate)

/ /

Appendix B : SPARQ-ed Bonus Rank Program Portfolio Checklist

Name :

Program Dates :

Program :

| Component | | Component Completed | Rating |
|------------------|-------------------|---------------------|-------------------------------|
| Pre-Program | Application | | Satisfactory / Unsatisfactory |
| | Literature Review | | Satisfactory / Unsatisfactory |
| Program Log | Day 1 | | Satisfactory / Unsatisfactory |
| | Day 2 | | Satisfactory / Unsatisfactory |
| | Day 3 | | Satisfactory / Unsatisfactory |
| | Day 4 | | Satisfactory / Unsatisfactory |
| | Day 5 | | Satisfactory / Unsatisfactory |
| Research Article | Draft | | Satisfactory / Unsatisfactory |
| | Final Copy | | Satisfactory / Unsatisfactory |
| Overall Rating | | | Satisfactory / Unsatisfactory |

Appendix C : SPARQ-ed Bonus Rank Program Literature Review Assessment Criteria

Name :

Program Dates :

Program :

| Criteria | A | B | C | D | E |
|--|--|---|---|--|---|
| Theoretical knowledge based on researched information | The student uses the researched literature to explain complex concepts and make appropriate links between the published scientific knowledge and the theoretical background of the project | The student effectively explains and describes the theoretical basis of the project by making appropriate reference to the researched information | The student effectively describes the theoretical basis of the project using the researched information | The student makes statements about the theoretical basis of the project without direct reference to the published literature | The student repeats the information presented in the project manual |
| Research Sources | The student effectively uses at least five references from reputable sources. | | | The student uses fewer than five references or uses references from non-reputable sources | |
| Writing Style | The student writes the literature review according to the provided guide to authors. | | | The student's writing deviates from the recommendations presented in the provided guide to authors. | |
| Overall | Satisfactory | | | Unsatisfactory | |

_____ / ____ / ____

Assessor Signed

Dated

Appendix D : SPARQ-ed Bonus Rank Program In-Program Activity Checklist

Name :

Program Date :

Program :

| Component | | Attendance | Log Sighted | Comments |
|--|---|--------------------------------------|-------------|----------|
| Laboratory Program | Day 1 | | | |
| | Day 2 | | | |
| | Day 3 | | | |
| | Day 4 | | | |
| | Day 5 | | | |
| Research Seminars (tick if seminars conducted) | Tuesday Lunchtime <input type="radio"/> | | | |
| | Friday Forum <input type="radio"/> | | | |
| Tutorials | Library | | | |
| | Science Communication | | | |
| Closing Symposium | | | | |
| Overall Rating | | Satisfactory / Unsatisfactory | | |

Appendix E : SPARQ-ed Journal Instructions to Authors

SPARQ-ed Journal

Instructions to Authors

Research Papers submitted to the *SPARQ-ed Journal* should be written in English using correct grammar appropriate to scientific communication.

ie. Past tense, passive voice, third person.

eg. **Incorrect**

“Add 50 μ L of reagent to the tube”

“We added 50 μ L of reagent to the tube”

Correct

“50 μ L of reagent was added to the tube”

To ensure ease of review and return of feedback, all submissions should be in Microsoft Word (.doc or .docx) format or compatible.

Submissions must include the following sections:

Abstract: A single paragraph of fewer than 100 words. The primary goal of the abstract should be to make the significance and new findings of the work clearly accessible. Results and overall conclusions should be briefly summarized. There should be no references cited in the abstract.

Introduction: A survey of the published literature relevant to the study reported in the paper. The introduction should lead logically to the aim of the investigation and the principal hypothesis.

Materials and Methods: Identify methods, apparatus and procedures in sufficient detail to allow other scientists to reproduce the results. Where methods have been published elsewhere, provide references to these alongside brief descriptions.

Results: Results should be presented in a logical sequence including tables and illustrations. The most important observations should be explained and summarized in the text. Units of measurement should be expressed in appropriate SI units.

Discussion & Conclusion: The data in the results section should not be repeated, rather new and important aspects of the study should be emphasized, with observations related to other studies. The findings should be used to discuss possible implications and conclusions. If the conclusions lead to a new conclusion, this should be clearly labeled as such.

References: References should be cited in text and recorded using the Harvard System (see : www.library.uq.edu.au/training/citation/harvard_6.pdf). References are to be arranged in alphabetical order of the principal author’s last name.

Supplementary Data Tables: All tables should be numbered consecutively with Arabic numerals and include descriptive titles and legends.

Appendix F : SPARQ-ed Bonus Rank Program Research Paper Review Criteria

Name :

Program Dates :

Program :

| Section | A | B | C | D | E |
|------------------------------------|---|---|---|--|---|
| Abstract | The abstract is concise and summarises the relevance of the research reported to a wide audience. | | | The abstract does not meet requirements | |
| Introduction | The student uses the researched literature to explain complex concepts and make appropriate links between the published scientific knowledge and the theoretical background of the project | The student effectively explains and describes the theoretical basis of the project by making appropriate reference to the researched information | The student effectively describes the theoretical basis of the project using the researched information | The student makes statements about the theoretical basis of the project without direct reference to the published literature | The student repeats the information presented in the project manual |
| Materials and Methods | The materials and methods section is concise and contains enough information for other researchers to repeat the experiment. References to published methods are used appropriately | | | The materials and methods section does not meet requirements | |
| Results | Results are recorded in a logical and easy to follow format in the form of appropriately labeled and designed tables, graphs and / or figures. | | | Results are not present in an appropriate format | |
| | The results section does not include discussion of the significance of the data obtained | | | The significance of the results are discussed in this section | |
| Discussion & Conclusion | The student effectively uses the data collected and organized to identify relevant trends and inter-relationships, which are then used to discuss the significance of the results in light of the original aim and hypothesis and draw relevant conclusions | The student effectively uses the data collected and organized to identify relevant trends, which are then used to draw conclusions about the results of the investigation | The student draws conclusions supported by the data presented | The student draws conclusions about the investigation with minimal support from the data | |
| | The student critically analyses the investigation in light of the results and makes suggestions about improvements to the method and the potential for future investigations | The student makes suggestions about improvements to the method and future directions of the research | The student makes suggestions about changes to the method and future directions of the research | The student identifies elements in the procedure which could be improved | The student makes no suggestions about improvements to the procedure or future investigations |
| Research Sources | The student effectively uses at least five references from reputable sources. | | | The student uses fewer than five references or uses references from non-reputable sources | |
| | References are recorded and cited appropriately | | | References are not recorded or cited appropriately | |
| Writing Style | The student writes the literature review according to the provided guide to authors. | | | The student's writing deviates from the recommendations presented in the guide to authors. | |
| Overall Draft Evaluation | Satisfactory | | | Unsatisfactory | |
| Final Version Review | The student has incorporated relevant changes into draft based on reviewers' comments or has presented cogent arguments as to why changes should not be made – Suitable for Publication | | | Reviewers' comments have not been taken into account – Unsuitable for Publication | |

