

## Statistics Series Project Report

1. Report Summary
2. Background
3. Aims
4. Activities
5. Future Developments

### 1. Report Summary

The Statistics Series Project was started in response to research active staff requests, expressing a growing need for support and development activities.

An expanding bank of online resources have effectively backed up the support given in the seminar sessions, providing valuable information for those unable to attend in person and research staff who continue to join the university.

The seminar series has continued beyond the pilot phase and we will be building further on the success of the project from January 2014 when research active staff will share their experience and application of statistics in their work, alongside the expert talk on a key topic.

### 2. Background

The project was set up by Sandy Sparks, Learning & Development Adviser in LDC, following requests from research active staff to:

- improve understanding of statistics in research methodology
- develop knowledge and skills in statistical analysis to enhance the preparation and completion of research projects
- benefit the university by increasing the staff skill-base and improving the quality of research outputs more broadly.

An example quote from a researcher:

*"I do have views on training needs. I am now wondering how many other ECRs and other academics would benefit from short courses or workshops on statistical testing methods, beyond that which IT services provide.*

*Specifically, I think it would be of use to hold a workshop or a series, even, on Regression-linear, logistic and multilevel modelling. Perhaps something also on conducting, interpreting and trouble shooting of repeated measures designs and the use of t-tests, GLM repeated measure tests.*

*I think workshops of this nature could help investigators with their methodological design and analysis, could reduce stress and increase confidence, and could perhaps promote co-operation between statisticians and non-statisticians by though more statistically well informed investigators. It might reduce the time burden for investigators and statisticians, and might even improve the quality and/or quantity of journal articles submitted over time."*

In determining the remit for the project we investigated the range of statistical support available at other institutions, including:

- methods@manchester (<http://www.methods.manchester.ac.uk/methods> )

- Statistical Services Centre (University of Reading - <http://www.reading.ac.uk/SSC/> )
- Mathematics Learning Support Centre (Loughborough University – <http://www.lboro.ac.uk/departments/> )

All provide statistics support across a spectrum of online resources, consultancy advice and training sessions.

### 3. Aims

We aim to encourage the development of statistical analysis in research from the inquisitive and inexperienced to those with specific, technical questions wishing to advance their studies. The programme is offered in addition to existing support offered in Faculties and Departments.

From the outset, the project included the provision of lunchtime seminars with lunch included) once a month. To select the most appropriate areas for discussion we sought suggestions in a survey open to research staff and approached RISCU (Risk Initiative & Statistical Consulting Unit), receiving expert advice and ongoing collaboration with Professor Simon French (Director of RISCU).

The seminar sessions include:

- input on specific techniques and their uses by a specialist in the field
- examples of researchers using the techniques for particular purposes
- outcomes and issues to consider the challenges involved
- top tips for experienced users

Additional ideas for support would also be explored:

- 1-1 support
- developing a network of researchers
- online support resources

### 4. Activities

**The project has been a collaboration between LDC, Professor Simon French (Director of RISCU) and Dr Andrew Mead (Life Sciences) from the outset, with Simon and Andrew providing the expert statistical advice, contacts and many of the talks in the seminar series.**

**Lisa Lavender, as project officer, was appointed to develop the provision, including the management of the ongoing series time-table and building of online resources.**

#### Seminars

**The sessions run from September 2012 to June 2013** were funded by LDC/EPSRC Enterprise & Entrepreneurship funds. A comprehensive Event Resource Page (including podcasts, presentations and bibliographies) for each session are included on the Seminar Series Programme website following each event.

A total of 8 seminars were held in the 2012/13 academic year on the following topics.

- *The Role of Statistical Analysis within a Broader Research Methodology*
- *Experimental Design*
- *Confirmatory Statistics: Identifying, Framing & Testing Hypotheses*
- *Estimation, Variation and Uncertainty*
- *Exploratory Data Analysis and Multi-variate Strategies*
- *Bayesian Modelling & Analysis*
- *Regression Modelling, Variable Selection and GLMs*
- *Qualitative & Quantitative Analysis, Survey & Questionnaire Design*

Attendance across the series ranged from 10-25 people, with many attending three or more sessions in the series. Departments represented in attendance included the Institute for Educational Research, WMG, Law, WBS, Engineering and PAIS, but with a preponderance in the sciences: WMS, Psychology, Life Sciences and Physics.

The stated reasons for attendance were often similar, as noted in the quotes below.

Quotes:

*"I used quite a complicated stats technique for my PhD (multi level modelling) that I learned from books and some advice from a statistician. However, I feel I lack a more general understanding of stats and would like to learn more about issues such as how to frame your research objectives well, research design and appropriateness of stats analysis. I currently work on a large clinical trial and I'm being given the opportunity to become more involved in some aspects of analysis. So would like more confidence to be able to do this – and hopefully take skills forward when I apply for a Post Doc Fellowship."*

*(researcher in the Clinical Trials Unit)*

*"I use statistical tests in my research all the time, but it has been all self-taught. I have never taken a course on statistics before, and I would like to get a broader overview of statistical tests and methods, rather than just learning about a specific test when I see it mentioned in papers, which is much more prone to error."*

*(researcher in Physics)*

*"I wish to understand the statistical methods used in research a little better, especially techniques used in meta analyses. I have studied stats but its been a while! Recap on practical stats methods ... would be useful. As a researcher, an outline of available stats techniques and usefulness of different tests would be great."*

*(researcher in WMS)*

Feedback was generally very positive and constructive, for example:

*"People appeared to have lots of specific questions that they always leave to the end, as the group disbands. It would seem a good idea to ask people to put forward papers, etc that have been rejected on stats issues and ask an expert to go through it publicly with the whole group. I'm sure we'd all learn a lot from seeing how a skilled statistician would address such criticism"*

However, it is also reasonable to suggest that pitching the talks to meet the needs of a cross-section of departments, experience and expertise could be difficult.

The considerations raised helped to inform further developments in the project, noted below.

## Website

A project website was set up to introduce the series and advertise seminars in advance of the 2012/13 academic year:

[http://www2.warwick.ac.uk/services/ldc/researchers/opportunities/development\\_support/mathstats/](http://www2.warwick.ac.uk/services/ldc/researchers/opportunities/development_support/mathstats/) . As the series developed, specific sections were set up to include:

- A 'Statistics Glossary' of terms
- A guidance list of statistics software packages being used at Warwick
- A case study by Simon French (Director of RISCU) reflecting on the pilot Statistics Series [http://www2.warwick.ac.uk/services/ldc/researchers/resource\\_bank/statistics\\_pilot/](http://www2.warwick.ac.uk/services/ldc/researchers/resource_bank/statistics_pilot/)
- Resources pages in the new Research Active Staff Resource Bank: [http://www2.warwick.ac.uk/services/ldc/researchers/resource\\_bank/](http://www2.warwick.ac.uk/services/ldc/researchers/resource_bank/), including videos of the speakers' talk, presentation files and additional resources.  
There have been 1,624 views of the statistics resource pages (averaging 180 hits per talk) in under 6 months, since the launch of the website in May 2013.

## Statistics Support Steering Group

The series has proved very successful but has also highlighted a number of demands we would like to explore to expand the range of support offered in this area over the next two years. The Steering Group held an initial meeting on 16 April 2013 and focused on the future development of statistical support for researchers.

### 1-1 meetings.

There was interest from the outset in the provision of 1-1 meetings to discuss specific researcher queries and a procedure was established within the first term of the project to offer support. The focus was on advice at the planning stage of a research project, to ensure (where possible) that correct provision is written into funding bids and data collection is designed appropriately.

To date, this support has been provided for six research staff in WMS, WBS, PAIS and the Centre for Education Studies.

Quote:

*"As just discussed with you at the Stats seminar – my research group would like to meet 1:1 with an expert about a large project we have starting in October on comparing the real with the virtual world. It is going to be significantly beneficial for the research to have expert statistical advice from day 1 of this project.*

*Thank you again for a very informative and extremely useful initiative!"*

## Future Developments

- Continue and develop the seminar series (and associated online resources) to include:
  - Talks on further key statistical topics at an introductory/intermediate level for researchers.
  - A short session within each seminar where researchers will be invited to present the statistical approach in their research or research proposal for discussion: the aim is to establish good practice and develop possible networks and collaborations amongst research staff.
- Continue to offer 1-1 support, possibly developing a team of experts in different fields to enhance the provision.