

## HOW STATISTICAL SOCIETIES, SUCH AS THE ROYAL STATISTICAL SOCIETY, CAN HELP STATISTICAL EDUCATION

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*Statistical Societies (SS) have been around for many years in several countries. The amount of help and support they give to statistical education varies. For example the Royal Statistical Society (RSS) is a SS which supports statistical education in a variety of ways, which will be discussed in this paper. It has its own Education Strategy Group (ESG), which has developed a vision for education and is responsible for driving forward the education strategy (Royal Statistical Society, 2002). A range of the RSS members are also actively involved in supporting the Group's programme of activities by running education workshops or giving presentations at student events. The RSS ESG has developed a strategic forward plan for its activities in this sector and keeps up to date with all new developments in the field of statistics education.*

### INTRODUCTION

The RSS has always been concerned to promote statistical education and offers a varied and innovative programme of activities and services for teachers and students of statistics in all phases of education. This is well evidenced by its support for the RSS Centre for Statistical Education (<http://www.rsscse.org.uk/>) at Nottingham Trent University and through its various meetings and publication. The aim of the RSS Centre for Statistical Education is 'to promote the improvement of statistical education, training and understanding at all ages' (<http://www.rsscse.org.uk/about/aims.asp>). Although based in the UK, the Centre has an international role.

Although this paper will mainly concentrate on how the RSS helps statistical education, other countries' SS activities will be presented. Hence the aim of this paper is fourfold namely (1) to provide an insight into what currently SS provide; (2) examples of good practice; (3) how this good practice can be embedded into the statistical education of educational institutions and (4) the possible future for SS and statistical education.

### THE ROYAL STATISTICAL SOCIETY

The Royal Statistical Society was founded in 1834. It is a learned and professional society, with some 7200 members based in the United Kingdom and overseas. About 1500 of these members are *professionally qualified* (<http://www.rss.org.uk/membership/prof.html>). The Society's purpose is set out in its *mission statement* (<http://www.rss.org.uk/about/mission.html>).

- To nurture the discipline of statistics by publishing a Journal, organising meetings, setting and maintaining professional standards, accrediting university courses and operating examinations.
- To promote the discipline of statistics by disseminating and encouraging statistical knowledge and good practice with both producers and consumers of statistics, and in society at large.
- To provide effective and efficient services to its members which will support their professional and academic interests and their endeavours to advance the other objectives of the Society.

### WHAT THE RSS DOES FOR EDUCATION

The RSS has always had education at the heart of its provision. The current strategy for education was approved by the RSS council on 16<sup>th</sup> October 2002 (Royal Statistical Society, 2002). The RSS has always been concerned and willing to promote education. An example of this is its support for the RSS Centre for Statistical Education (<http://www.rsscse.org.uk/>) at Nottingham Trent University, UK and throughout its meetings and publications programme. Recently, aware of the serious lack of suitably educated and qualified statisticians to meet the considerable demand from government, education, industry and commerce the RSS established

the Education Strategy Group (ESG). The ESG coordinates the educational activities of the RSS. Membership of this group comes from a cross section of professionals with expertise from elementary education to university education.

#### EDUCATION STRATEGY GROUP

The RSS ESG education strategy provides a wide ranging vision for statistical education which includes the development of a successor generation of qualified statisticians. The RSS ESG is at the forefront of promoting statistical education and offers a varied and innovative programme of activities and services for teachers and students of statistics in all phases of education. The RSS ESG is involved with and co-ordinates most of the educational activities, meetings and publications. Activities and events include:

- the Associate Schools and Colleges Scheme - an active network of teachers of 5-19 year olds with whom the RSS works in partnership to support, encourage and promote good practice;
- the RSS Schools Lecture - a very popular series of lectures delivered by a new 'Guy' Lecturer each year for audiences of GCSE, AS- and A-level students and teachers at host schools across the UK. As well as the new Lecturer each year, lecturers from some previous years are also available to give their talks;
- education workshops - a programme of workshops delivered in host schools which are designed and tailored to meet a range of needs. Working with often cross-curricular groups of teachers and students, they build teachers' confidence and help them to communicate the relevance of the study of statistics and how pervasive statistics are in the workplace;
- statistics in the sciences education and public awareness events across the UK during festivals such as National Science Week;
- issues-based events for secondary school and undergraduate audiences held at the RSS or at host schools. Focused on using the analysis of data to arrive at an evidence-based and proportionate view of issues, and attracting senior-level speakers, past events have included a debate entitled '*HIV-AIDS: statistical, ethical and human issues*' and more recently, '*Phoney crisis?*' - a conference considering the risks and benefits of mobile phone technology, held at Cadbury 6th Form College in Birmingham, UK.
- Working with National And Gifted Talented Youth (NAGTY)
- The promotion of careers in statistics. A recent DVD entitled 'Statisticians Count – Careers in Statistics' includes interviews with six working statisticians who each share their motivations, achievements and ambitions and give a real insight into the impact of their work and the satisfaction they derive from it.

The Society's Education Strategy Group has developed a strategic forward plan for its activities in this sector and keeps up to date with all new developments in the field of Statistics education. Its members are actively involved in a range of consultancies concerning key issues such as the *Post-14 Mathematics Inquiry* (<http://www.rss.org.uk/main.asp?page=1223>) and the establishment of the National Centre for Excellence in Mathematics Teaching *inter alia*.

#### NAGTY

In the white paper 'Schools: Achieving Success' (2001) the UK Government announced its intention to establish an Academy for Gifted and Talented Youth. This Academy's remit was to develop, implement, promote and support educational opportunities for gifted and talented children and young people up to the age of 19, as well as providing support for parents and educators. The Academy is based at Warwick University (UK) and works with its core partners namely the 'Research Centre for Able Pupils at Oxford Brookes University (UK)' and the 'Centre for Talented Youth at John Hopkins (USA)' together with a wider network of partner universities and professional organisations such as the University of Durham, the London School of Economics and Political Science, the University of York and the Royal Statistical Society to name but a few. The Academy began its provision with its pilot programme in the summer of 2002. The RSS held its first outreach event during July 2003. See the following website:

<http://www.warwick.ac.uk/gifted/outreach/02-03/reviews/simulations.htm>.

The RSS is committed to education and to supporting teachers, schools and outreach activities that promote the teaching of statistics to all. The RSS ESG already provides workshops for students and teachers, a schools lecture series, the CensusAtSchool international programme and many other outreach activities relating to statistical education. Outreach events form a major strand of NAGTY's Academy work. The aim is to provide opportunities that compliment a student's school experience and allow students to engage with specialist opportunities that are difficult to provide within the normal school context (Department for Education Skills, 2002). Statistics, as a subject in its own right, is rarely taught as a major stream in the UK so providing material outside the standard curriculum was not a real issue. The RSS ESG decision to work with the Academy was primarily to bring to the forefront statistics as a subject in its own right as well as complimenting other subject disciplines and to encourage students to consider statistics as a profession. The RSS has extensive experience of providing day school and workshops in this area.

#### RSS CENTRE FOR STATISTICAL EDUCATION

The aim of the RSS Centre for Statistical Education is 'To promote the improvement of statistical education, training and understanding at all ages' (<http://www.rss.org.uk/main.asp?page=1964>). Work to support this aim is carried out in four main areas:

- (i) school and further education;
- (ii) higher education for all courses in which statistics is taught;
- (iii) continuing professional development including all who use statistics as part of their professional life;
- (iv) society as a whole.

Although based in the UK, the Centre has a major international role; for example the Census At School <http://censusatschool.ntu.ac.uk/index.html> project has been widely adopted and used in many countries such as Canada, New Zealand and South Africa to name but a few. The centre has many resources that it shares with UK and overseas educational institutions. A popular feature of the centre's website is the news and events column. See their website for the contact details and for further information (<http://www.rsscse.org.uk/news/>).

#### ASSOCIATE SCHOOLS AND COLLEGES SCHEME

This provides support and information, including, at present, a regular newsletter about events and teaching resources, three times a year. The programme costs £45 per year which includes a discounted subscription to the journal *Teaching Statistics* (<http://science.ntu.ac.uk/rsscse/ts/>) and free copies of *RSS NEWS*.

#### TEACHING STATISTICS JOURNAL

*Teaching Statistics* is an international journal aimed at teachers of statistics. The target audience is teachers of students aged up to about 19. This deliberately includes the earlier stages of university courses, but the main focus is on teachers in schools and colleges. This includes teachers of subjects such as economics, biology and geography where a lot of statistics is used, as well as teachers of statistics (often as part of mathematics) as a specialist subject. The articles and other material in the journal are intended to be immediately useful in the classroom.

It is published three times each year by Blackwell Publishing on behalf of the Teaching Statistics Trust. *Teaching Statistics* has its own website on which you can see full information and you can also subscribe to it (<http://www.blackwellpublishing.com/journal.asp?ref=0141-982X>).

## POLICY ISSUES AND GOVERNMENT INQUIRIES

The RSS regularly responds to education policies, government inquiries and issues concerning the statistical education in various syllabuses. Examples are:

- Responding to Qualifications and Curriculum Authority consultation on examination board A/AS Mathematics criteria;
- Response to the Post-14 Mathematics Inquiry;
- Post-14 Mathematics Inquiry: National Centre for Excellence in Mathematics Education.

## TALKS, CONFERENCES AND OPEN DAYS

Talks for example PISA Study and Continued Professional Development (CPD) for teachers and educationalists on pedagogic issues for statistical education are at the forefront on the RSS's agenda. A conference on assessment of statistics at GCSE and A/AS level is one held recently. The RSS regularly opens its doors to the public. Teachers and students are invited to attend these days when various taster sessions/activities are run to encourage students to take up statistics. A, recently held, half-day meeting entitled 'Statistics at Work' was aimed at teachers with an interest in how statistical skills acquired at school/college and university are applied in the workplace. This is a further example of the type of talks that the RSS hosts.

## ARTICLES OF INTEREST AND RESOURCES

The RSS has a comprehensive and up and running website which has links with Professional Associations. This site contains articles of interest and resources. These are accessible and freely available.

## SCHOOL WORKSHOPS

The Society's Education Strategy Group has been holding regular one-day statistical workshops for teachers or pupils and it is intended to continue and enhance these. The workshops carry a minimal charge but all the facilities such as rooms, refreshments and resources are free. The RSS has found this to be the optimal mechanism for providing workshops in schools.

## THE INTERNATIONAL ARENA

The UK is not the only country to provide activities of this type to teachers and students. Other countries such as Australia, Canada, New Zealand and the USA, to name but a few, have mechanisms to support and enrich student's learning. For example Purdue University, USA under the 'Gifted Education Resource Institute' advertises super summer programmes where "Classes are fast-paced and interactive, and you'll find friends who share your interests and love of learning. You'll also enjoy a wide variety of fun summer activities" (<http://www.geri.soe.purdue.edu/main/default.html>), New Zealand has many on line resources to use for students and teachers (<http://www2.auckland.ac.nz/lbr/edu/Maths.htm>), Canada has an Open Mathematics Challenge (<http://www.cms.math.ca/CMS/Competitions/COMC/>) "to motivated younger students who have done some enrichment study beyond their school year" and Australia (<http://www.vsg.edu.au/>) has a 'Virtual School for the Gifted,' which is an online school that specialises in providing enrichment courses to complement and extend able students learning from Australia and overseas.

## EMBEDDING INTO THE CURRICULUM

The above examples of how the RSS tries to help education can be embedded into the curriculum. Other SS can and do offer help to schools and colleges. If your country has a SS then contact them to find out what is on offer or possibly make a suggestion to them on how they can help you, as in most cases they are more than willing to help. Planning is a key objective in this case. Arranging for professionals to come into the educational institution is a lengthy process and so the earlier the planning starts the better. The workshops can then be tailored to suit the institutions curriculum so that the most can be made of the day or session. The web is a resource that teachers from all over the world can use and in most cases provides free resources to use in the classroom. Try to include SS into the CPD of educationalists as this provides a mutual sharing forum. There are many ways to involve SS and they are more than willing to help.

## CONCLUSION

This paper has looked at and elucidated the following areas:

- (i) provision in relation to statistics education;
- (ii) examples of good practice, and where these could be adopted;
- (iii) how this good practice could be embedded into the statistical education of educational institutions and
- (iv) the way forward for SS and statistical education.

The RSS plans to continue to do more of this type of work and to add it to its education portfolio of provision for students. In addition the ESG aims to develop yet stronger outreach to students at all levels, building on existing activities such as education workshops, RSS school lectures and the associate schools and college scheme.

## REFERENCES

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