

SPOC – STATISTICS POSTER CHALLENGE FOR SCHOOLS

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The analysis and interpretation of data are important skills in everyday life. They help us understand and explain what is happening. From the age of 5 upwards children are expected to learn various graphical and descriptive measures to summarize data. A poster challenge provides an innovative outlet for these skills as well as demonstrating their relevance in general life. The Statistics Poster Challenge (SPoC) is based on the successful Statistics poster competition run in Michigan since 2000 and presented at ICOTS7. We discuss SPoC and the lessons learned by the SPoC team.

INTRODUCTION

Initiatives at the school-university interface are becoming increasingly common. Some aim to address specific skills gaps, provide higher level tuition than routinely available in schools, recruit potential university students; some are aimed more at increasing awareness of university life amongst school children, raising aspirations, and more generally increasing engagement with particular subjects through a range of ‘fun’, and often extra-curricular, activities. There are incentives for both school and university staff in fostering such links, through increased recognition in career development, potential inclusion of the impact of such work in external institutional assessments, as well as rewards in terms of personal satisfaction.

In this paper we discuss one such initiative, the Statistics Poster Challenge (SPoC). SPoC was born after one of us (BP), together with another co-founder, saw a presentation on the successful statistics poster competition run in Michigan since 2000 at ICOTS7 (Gabrosek, 2006). The Michigan poster competition, supported by the American Statistical Association (ASA) and the National Council of Teachers of Mathematics (NCTM) is one of many regions/states with a yearly poster competition.

SPoC originally represented a collaboration between the University of Sheffield, Sheffield Hallam University, The Royal Statistical Society Centre for Statistical Education and the University of Leicester. It has now been successfully running for three years in South Yorkshire, Leicestershire and more recently the South West.

LINK WITH THE CURRICULUM

Common to both the US and the UK, the use of a statistics poster competition is encouraged at all school levels to enable student involvement in statistical activities. In many cases the work demonstrated in performing the statistical activity and producing the poster will meet set curriculum standards and provide evidence of specific skills. For example, it is possible that all areas of the handling data curriculum within Key Stage 2 (Ages 7 to 11), namely problem solving, communicating, reasoning, processing, representing, and interpretation, can be covered in the process of creating a statistical poster. Similarly the data handling cycle taught at Key Stage 3 (Ages 11 to 14) can be the motivation for performing suitable statistical investigations and provide the structure for summarizing them as a poster. With appropriate guidance, there is scope for students to apply their knowledge, skills and understanding to investigate real-world situations which may be motivated by other subject areas.

SPOC: THE RUNNING OF THE STATISTICS POSTER CHALLENGE

The SPoC website (SPoC, 2007) is key to the efficient administration of the challenge. All necessary information for entry, including entry forms, poster guidelines, rules, poster examples, hints, prizes and the rationale of the SPoC challenge can be found at www.schoolspoc.org.uk. Since 2007 the annual challenge has been run by a minimum of 3 academics, with an interest in improving the statistical skills of students within schools. Currently, entries are welcome from Year 3 to Year 13 students studying in schools within Yorkshire and the South West of England.

The closing date for entries is early June, in order that judging can be performed and prizes and certificates awarded prior to the end of the school term in July. Judging is performed by the SPoC team together with an invited expert in the teaching and learning of mathematics within schools. Judging is performed at all year levels and prizes of £20, £10 and £5 are awarded for 1st, 2nd and 3rd respectively for each level. All student entries receive a personalized certificate.

The entries come in all shapes and sizes and are typically very creative and colourful. A selection of winning entries from 2010 are shown in Figure 1. Photographs of winning posters from all years can be found on the SPoC website.



Figure 1. A selection of winning entries from 2010

CRITICAL APPRAISAL

Our overall objective is to motivate the positive experience of students in performing statistical investigations with real data from an early age. In doing so we expect an improvement in the statistical skills of school leavers and undergraduates.

To date approximately 1120 pupils from 28 schools have participated in SPoC. Initially our expectations of a good statistics poster were not met by many of the entries in 2007. In 2008 we provided further guidance by providing hints of what *we like* and what *we do not like*. In summary,

We like:

- Topics that were clearly introduced;
- Methods for collecting data were clearly described;
- Posters which told a story;
- Results that were clearly presented in sensible, relevant tables, graphs and charts;
- Conclusions clearly stated and sensible;
- Posters with an interesting idea.

We do not like:

- Poorly labelled graphs and histograms;
- Inappropriate line graphs;
- 3D graphs;
- Untidiness;
- Lack of a decent introduction;
- Methods not clearly explained;
- Lack of conclusions;
- Poor spelling and grammar.

The quality of the posters has also varied amongst the age groups. To our surprise the standard of the poster entries is typically higher at primary school level, with well performed investigations creatively presented. Our explanation is that teachers at primary school provide more guidance and allocate more time to the poster competition.

Teacher feedback

Feedback from participating schools was obtained in 2009 with a SPoC feedback survey. Analysis of the data collected from eight participating schools revealed the following:

- SPoC is accessible to all pupil abilities.
- “SPoC has helped to engage our students in maths and statistics.” Teachers either *strongly agreed* or *agreed* with this statement.
- Boys and girls were equally engaged, apart from one teacher who indicated boys were more engaged.
- SPoC enabled students to apply/reinforce their knowledge in maths, statistics and other themed projects, such as healthy school week.
- All teachers strongly agreed that their students had fun creating their poster.
- Overall the prize amounts were considered just right with interest for a SPoC representative to award the prizes to the students.

Views from the SPoC team

SPoC has provided an effective outlet for students to work as a team in applying their data investigation skills, whilst encouraging ownership of work and practising useful presentation skills. There is greater scope to use SPoC for cross-curricular investigations. Promoting this type of initiative is a difficult and slow process, particularly when there are many competing initiatives within schools.

THE FUTURE

By building on the relationship with current schools and with regional NCETM (National Centre for Excellence in the Teaching of Mathematics) contacts we plan to extend the availability of SPoC to further regions in the UK and to promote SPoC for cross-curricular investigations. Funding is also being sought to secure the project for a minimum of 3 years.

The overall value of the initiative is summarised in this quote from the 2009 feedback: “*All the children enjoyed the experience. It was a new experience for them – it’s not very often that maths is ‘pretty’ and ‘creative’.*” We hope that responses like this will allow us to demonstrate the effectiveness of the competition and promote its wider adoption.

REFERENCES

- Gabrosek, J. (2006). *Designing, promoting, and implementing a Statistics Poster Competition for pre-college students*. ICOTS 7.
- SPoC (2007). *Statistics Poster Challenge for school children of all ages Y3 to Y13*. Online: www.schoolspoc.org.uk.