SPSS Statistics for Data Analysis in Academia

The Perfect Match

Wimbledon High School is an independent day school based in London. Established in 1880, they offer a holistic education of cross-curricular study alongside consistently excellent teaching to over 1,000 girls, aged 4 to 18.

The school has embraced a 'STEAM' approach, combining the Arts with STEM subjects in enriching interdisciplinary study that fosters creativity and problem solving and prepares students for university and beyond. They run over 140 co-curricular clubs, ranging from music, sports and drama to robotics and data science. The Racket Research Club was formed when teachers and students brought together their love of STEM subjects and interest in data science with an interest in sport. It promised an environment where students could learn, explore and gain from the experience of working with specialists in the field.

Background

The Racket Research Club at Wimbledon High School was given license to use a dataset from All England Lawn Tennis Club (The Championships, Wimbledon) for the purposes of educational analysis and interpretation.

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Members of the club were tasked to understand whether there were any patterns or trends within the dataset, testing their own hypothesis within the tennis game and whether there were any statistical factors that impacted the outcomes.

Given the scale and size of the dataset, the school was very keen for the girls at Racket Research Club to work with the data to support class and project work and gain valuable data analytics experience.

The Racket Research Club

The Racket Research Club is just one of the groups that Wimbledon High School operates as part of their numerous STEM activities. This club has been running in the school since 2018 and there are, on average 8 to 10 regulars in the club.

The students in the club are in key stages 4 and 5 (ages 15-18) and they were fortunate enough to continue during Lockdown as project work could be presented and delivered remotely.

Historically the Racket Research Club had not been using any tool or specific data analysis application to support their research and had been working mainly with MS Excel to analyse the data and produce graphs.

Dr Clare Roper, Director of Science Technology & Engineering who oversees the Departments of Biology, Chemistry, Physics & Computer Science, runs the numerous groups within the Big Data Science Club, including the Racket Research Club, and was keen for the students to publish their tennis data research.

Given the size of the data set, Dr Roper realised that supporting the club's findings with credible statistics could only be achieved with the help from a trusted data analysis tool. The results were not going to be of any value to the scientific community if they were not backed up with statistics.

Exposing the students to this type of project work and experience in their school years was an unmissable opportunity, particularly for those students who were showing an interest in STEM subjects and occupations. The school is dedicated to inspiring and guiding the girls within a supported environment, to experiment and get involved in projects that deliver real life experiences and a unique perspective into today's working life.

Next Steps

Having historically used the statistical analysis tool SPSS from IBM, Dr Roper contacted them to understand what software options may be available to the school, and IBM referred the school to IBM SPSS Partner Version 1 and their dedicated SPSS team to assist.

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The club initially made use of a trial version of the software and within that **short space of time, were able to sort the data and produce their results**. One student involved in the research project created her research paper which was subsequently published on the International Journal of Performance Analysis in Sport. She initially performed some descriptive statistical tests to check the data for normality and then ran a series of ANOVAs (analyses of variance) and ANCOVA (analyses of covariances), to evidence the statistical differences between serve speed in various categories (1st versus 2nd serves in female and male players).

After the success of the Racket Research Club research publication, Dr Roper was keen to deploy SPSS to a larger group of school users. This would create an opportunity for the following:

- Eliminate where possible, any coding groundwork. The users could confidently enter their data and trust that SPSS would deliver the right results without any complicated coding or programming
- As some of the Maths and Biology modules included an element of statistical analysis, pupils and staff would benefit from gaining access to SPSS to support their class work
- Any of the Big Data Research Club members would gain access to the software

The longer-term solution for SPSS was to allow a larger group of staff and students access to the software. The school sought the advice of Version 1's SPSS team to understand the various options available to them.

Version 1 Academic Solution

Version 1 are the sole supplier of the SPSS Academic License in the UK and Ireland, providing IBM SPSS to over 250 Universities and Colleges. Version 1's aim is to increase the ability of students and academics to both learn and teach statistics using IBM SPSS.

SPSS is an advanced statistical analysis tool used in all industries throughout the world to understand complex data, gain statistically significant insights and predict future outcomes. From an academic point of view, **SPSS is heavily used by students and staff for all types of statistical analysis, survey research, and for administrative purposes**. By using SPSS, both students and staff can gain statistically significant insights from data and **produce intuitive reports to convey the results.**

Used across all departments from Geography to Sports Science, the experience that students gain from using SPSS enables them to enter the workforce already practised in statistical procedures. It helps to support coursework, as well as enabling them to develop the advanced analytical skills that they will need in their post Academic life.

Version 1's SPSS Academic team engaged with the school's stakeholders to understand the license requirement across pupils and staff, and were able to tailor a bespoke license solution that catered for both sets of users within the school's commercial budget allowing for use both on and off site.

Once the SPSS trial had expired Version 1 provided temporary licenses to ensure students stayed up and running with SPSS while the contract was put in place. Once the purchase was complete the school was able to quickly install the software on the school's hardware and any specific pupil's laptop.

Benefits of using SPSS

The benefits to the school staff and in particular, the students when using SPSS, has been considerable:

- The students benefit from the unique experience of working with real-world datasets, running tests and analysing results in a supported academic environment, enriching their understanding and knowledge of organising datasets and testing.

- Some of the science subjects within the school curriculum have a statistical element (Biology, Maths) and those students that have had exposure to statistical analysis within the science clubs have benefited greatly from this experience within their curriculum course work.
- **Organising and running the tests on very large data sets has been much quicker and easier with SPSS.**
- **SPSS has an easy-to-use user interface. Students can explore and analyse data using code or a visual user interface.**
- **SPSS also provides help at every step. Students can get help from the Help menu or help to understand statistical tests and techniques as they work.**

Looking ahead

As a result of The Championships, Wimbledon data and subsequent publication of the results, the opportunities for taking advantage of SPSS's usability and features have been realised with access broadened across the school. This will give the school the opportunity to expand the scope of their Big Data Research Clubs and include their students in more real-life data science projects offering an unrivalled level of insight and experience.

For those girls with a particular interest in STEM subjects, this early life exposure to data science methodologies and research provides an invaluable foundation of learning that **underpins their academic studies and introduces the opportunity for exciting careers in science and technology.**

About Version 1 – IBM SPSS Analytics Partner for Academia

Version 1 are the sole supplier of the SPSS Academic License in the UK and Ireland, providing IBM SPSS to over 250 Universities and Colleges to increase the ability of students and academics to both learn and teach statistics using IBM SPSS. We also provide solutions to improve student retention rates, deliver the best student experience and create a smarter student recruitment strategy.

Version 1 offers a variety of options for integrating statistical and data mining instruction into the classroom ranging from individual user licenses to smaller school or college licenses and ultimately unlimited user University site licenses.

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