A Pilot for a Shared On-line Statistics Advisory Service

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A Pilot for a Shared On-line Statistics Advisory Service

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1. Executive Summary

Statistics Advisory Services (SASs) have recently been established at several UK HE institutions (Patel et al., 2010), offering statistics help and advice to students undertaking a final year undergraduate or masters project or engaged in postgraduate research. A SAS is appointments based and is normally provided in addition to drop-in support offered via a mathematics support centre. Typically it offers statistics advice in relation to aspects of study design, questionnaire design, data analysis, use of statistics software, and the interpretation and reporting of results. However, not all UK HE institutions currently offer this type of SAS, possibly due to a lack of suitably experienced personnel or financial resources. In response to this, this report investigates the outcomes and experiences gained from a HE STEM-funded pilot project for an on-line SAS shared between several HE institutions.

The objectives of the project were to identify the practical and pedagogical issues associated with sharing an on-line SAS resource, and to elicit the opinions of students using the service in order to understand their expectations and experience of using this type of on-line support. Students' opinions were sought via a follow up on-line questionnaire, the results of which are discussed in this report. In addition, more in depth opinions were gathered from three students via follow up case study interviews which are also summarised in this report.

The project facilitated a total of 68 appointments taken up by 46 students from the three partner institutions. These partner institutions were Birmingham City University, De Montfort University and the University of Sunderland. A statistics advisor was employed as part of the project, working remotely from her home. The students met with the statistics advisor using an Elluminate[1] on-line learning space/web meeting tool. The Elluminate learning space was provided by Loughborough University which has recently adopted Elluminate as its primary on-line learning space. For the last two years his tool has been used to provide on-line access to the SAS for Loughborough University students who are studying or researching part-time or via distance learning.

The over-riding picture that emerged from the study was that the students found Elluminate easy to use and both the students and the statistics advisor felt that this tool has many advantages for use in the provision of this type of on-line support. However, many students did experience some technological issues during their appointments. These were reported across all institutions and related mainly to either difficulties with the audio or to connectivity problems. The occurrence of both of these problems does, however, depend very much on the computer hardware and type of connection being used by the student. These problems could be removed to a large extent if the student had access to a PC at their host institution, which was known to have a good wired internet connection and a headset that functioned correctly using Elluminate.

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[1] Note that Elluminate is now known as Blackboard Collaborate (see www.elluminate.com)

Some students also displayed a lack of confidence with using this type of on-line tool. This may be partly due to a lack of previous experience with the technology. Where the student's first language was not English, communication difficulties may also have been a contributory factor to this lack of confidence. Some of these problems with lack of confidence can be overcome to some extent by giving one-to-one instruction on using Elluminate before their on-line appointment. Note that all students were given written instructions on using Elluminate prior to their appointment and also pointed to a video providing further instruction if required. Some of these students did also receive one-to-one instruction in the use of Elluminate by a local contact at the host institution.

If such a shared SAS resource is being considered in the future then it seems clear from this pilot that a local contact at each partner institution forms a vital component of the success of the service. This same person could also provide a screening function, similar to that undertaken at some of the host institutions during this pilot, to ensure that their needs could be satisfied via the on-line SAS.

In terms of the pedagogical value of the service to the students, 85% of the students completing the survey reported that they were able to obtain help with "Most" or "All" of their statistics problems and the remaining 15% reported that they were able to obtain help with "Some" of their statistics problems. Furthermore, all but one student in the survey considered their overall experience of the service to be "Good" or "Very Good" and these same students said that they would use this service in the future if there was no alternative source of support and would also recommend this service to a friend.

This pilot study has therefore demonstrated that an on-line SAS is able to offer a practical alternative to an institution specific face-to-face SAS if suitably experienced staff are not available locally. In addition, it has shown that is feasible for this type of service to be shared by a number of institutions and that this might offer a viable option in order to share the financial costs of providing such a service.

Elluminate was also shown to be a suitable tool for the provision of an on-line SAS, particularly in view of its easy to use application sharing facility. This means that statistical software such as SPSS or Minitab, or indeed? Excel, can be shared simultaneously by both the student and the statistics advisor. This allows the statistics advisor to see the student's data during the appointment.

We believe that this type of shared service would offer universities a viable alternative means of providing a SAS without incurring the financial costs of resourcing a SAS solely dedicated to their own institution. Given the new climate of student access to information relating to learning support and the proposals set out in the UK Government's Higher Education White Paper on "Students at the heart of the System" (2011), it would seem sensible to further consider this type of support provision and we look forward to being able to take this idea forward.

2. Background and Aims and Objectives

Experience suggests that the statistics teaching which some undergraduate students receive across a wide range of subject disciplines including STEM subjects, is not always sufficient for them to effectively apply suitable statistical methods in their final project or research. For example the report by Roberts (2002) highlighted a shortage of these types of skills in the UK graduate employment market. To improve on this skills shortfall, some HE institutions now offer a Statistics Advisory (SAS), which is targeted at students undertaking a final year undergraduate or master's project, or those engaged in postgraduate research.

For example, Loughborough University and Coventry University provide an appointments based SAS for students undertaking a final year or master's project or engaged in postgraduate research (see **http://www.sigma-cetl.ac.uk/index.php?section=18** and Smith & Gadsden, 2006). This service offers statistics advice in relation to subjects such as aspects of study design, questionnaire design, data analysis, use of statistics software and interpretation and reporting of results.

The provision of this type of advice and support for students is becoming increasingly important as we move towards the new era of fully student-funded education in the UK. Indeed, in June of this year the UK government published a Higher Education White Paper ("Students at the heart of the System"), which sets out a number of ways in which universities will in future be judged by potential students in terms of the provision of this type of learning support.

However, many HE institutions do not currently provide a SAS, possibly due to a lack of suitably experienced personnel or financial resources, or perhaps a lack of direct evidence of demand for such a service at their institution. Where a lack of suitably experienced personnel or financial resources are the main barriers to providing a SAS, an alternative that institutions could consider is a scheme which involves a shared SAS service being provided via an on-line learning space, such as Elluminate[2] (see **www.elluminate.com**). Elluminate has recently been adopted across Loughborough University as its primary on-line learning space, and for the last two years this has been used to provide on-line access to the SAS at Loughborough University, for students who are studying or researching part-time or via distance learning.

The primary aim of this project was therefore to pilot a shared on-line SAS based using the Elluminate. The objectives were to identify the practical and pedagogical issues associated with sharing an on-line SAS resource, and to elicit the opinions of students using the service in order to understand their expectations and experience of using this type of on-line support. It was also hoped that the project would allow for an assessment of the potential demand for this type of service.

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[2] Note that Elluminate is now known as Blackboard Collaborate

3. Project Organisation

The project was led by Dr Alun Owen who for the last two years has offered SAS support on-line to Loughborough University students via Elluminate. Three partner HE institutions took part in this pilot scheme. These institutions and the staff contacts that formed part of the team for this project were as follows:

- Birmingham City University (Dr Peter Samuels)
- De Montfort University (Mrs Michèle Wrightham)
- University of Sunderland (Dr Bernadette Leckenby)

Dr Peter Samuels, Mrs Michèle Wrightham and Dr Bernadette Leckenby all currently provide mathematics and statistics support their respective institutions. Some statistics support is currently offered at all three institutions, but this is limited mainly to drop-in support and none of them currently offer an appointments-based SAS. None of these three staff had any significant previous knowledge of the use of Elluminate and so the project also provided for their expertise in this area to be developed using the experience brought to the project by the project leader.

The fifth, and perhaps most important, member of the project team was the statistics advisor, Ms Mollie Gilchrist, who had previous experience of providing a SAS at Coventry University and also had some previous experience with using Elluminate.

From November 2010 onwards, the proposed shared on-line SAS was advertised by the respective team members at each of the three partner institutions. This advertising took the form of web based notices and emails, posters, leaflets and staff communication. The actual service itself was then made available at those institutions, via on-line appointments with the statistics advisor between January 2011 and May 2011. This period was chosen since experience of the provision of the (face-to-face) SAS at Loughborough and Coventry Universities over the last five years suggested that this was likely to be when demand would start to be at its greatest, particularly amongst final year undergraduate project students.

The aim was to provide this service only to the students from the three partner institutions. The intention was for the service not to be made available to students at Loughborough University since an established SAS already existed there. Students at each of the three partner institutions interested in obtaining statistics advice through this pilot scheme were provided with both written (see Appendix A) and video based instructions on how to log-on and use Elluminate. Students at Birmingham City University and the University of Sunderland also received an initial screening appointment to establish that they required an appointment with the statistics advisor. This was also used to provide additional instruction on how to use Elluminate. Screening appointments were also provided where possible at De Montfort University but not in every case, due to the staff member not always having sufficient time to undertake this.

The instructions given to students asked them to email the statistics advisor in advance with a short summary of their problem and what they were hoping to

achieve from the appointment. In addition, students were advised to use a headset with a dedicated microphone and suitable headsets were made available for loan to the students for this purpose. However, not all students made use of this facility, preferring instead to use their own equipment.

The booking of appointments for students across the three different institutions was managed by maintaining a Google calendar displaying the statistics advisor's availability. Appointments were then entered into this calendar by the team members at each partner institution when requested and agreed with the students. Provision was originally made during the pilot to allow for a total of 90 appointments (i.e. an average of 30 per institution) each of 30 minutes duration. It was also anticipated that each appointment would require some preparation and follow-up work on the part of the statistics advisor. Students accessing the service were asked to complete an on-line questionnaire after the session in order to gather information relating to the student's experience of the on-line service, as well as their views on the need for this type of support.

A summary of the information derived from this questionnaire is provided in this report, along with a commentary discussing the views of the project team in relation to both practical and pedagogical issues associated with running this type of shared on-line service. All the students who completed the questionnaire were asked about their willingness to volunteer to provide a case study for this report. Three of these case studies are summarised later in this report.

The provision of the statistics advisor's time was funded by the National HE STEM Programme (see www.hestem.ac.uk), which also included a small contribution to part of the time spent on the project by the project leader. The remainder of the project leader's time on the project and the cost of providing the Elluminate virtual learning space were provided in-kind by Loughborough University. The time dedicated to the project by the remaining team members from the three partner institutions was provided completely in-kind by their respective institutions.

4. Summary of Project Outcomes

4.1. Numbers of Appointments and Students

A total of 68 appointments were taken up by 46 different students during the project, with several students accessing the service on a number of different occasions. An additional 14 appointments were made but not kept by the students concerned, either because they cancelled or forgot about the appointment or because they had problems connecting. This brings the total number of appointments initially made to 82.

The breakdown of the 68 appointments that were kept as well as the number of students involved, by institution, is shown in Table 1 below[3]. Of the 46 students seen in the pilot, 26 of these students completed the follow-up questionnaire. The numbers of students completing the questionnaire are shown in parentheses in Table 1. A complete set of tables summarising the results of this questionnaire can be found in Appendix B. The key observations to be made from those results are discussed in the remainder of this report, which also includes additional comments derived from the experience gained by the project team.

Table 1: Appointments Utilised and Student Numbers by Institution

Institution	No. of Appointments	No. of Students*
Birmingham City University	24	19 (9)
De Montfort University	24	14 (12)
University of Sunderland	17	11 (4)
Loughborough University	3	2 (1)
Total	68	46 (26)

*Students completing the follow up questionnaire shown in parentheses.

Whilst the number of appointments made was below the target of 90, some problems with cancelled appointments clearly accounted for most of this shortfall. However, despite advertising via web and email, along with posters and leaflets at each of the partner institutions, the results from the questionnaire suggested that 80% of students were actually made aware of the service through a member of staff or a friend. This appears to be consistent with the experience gained over the last five years at Loughborough and Coventry Universities, such that word-of-mouth and referrals by staff are the most effective forms of advertising this type of service. Unfortunately, this meant that creating a heightened awareness of this service in the

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[3] Note that these numbers include two students from Loughborough University that were seen during the project, since demand for the service had been lower than expected at that time and all available appointments offered by the normal SAS at Loughborough were fully booked at that time.

partner institutions over what was a relatively short period of time was always going to be a challenging undertaking.

A plot of the numbers of appointments that were kept each month during the project is shown in Figure 1 below. The increase in appointments between January and March may have been due to an increasing awareness of the service amongst the student population, or to an increased need to seek help as final year project deadlines approached, or perhaps a combination of both. The reduction in appointments observed in April is probably due to this being out of term time, whilst the decrease in May is partly due to the fact that appointments were closed by the middle of May, and perhaps also due to the fact that there would be fewer final year undergraduate project students still seeking help at that time.
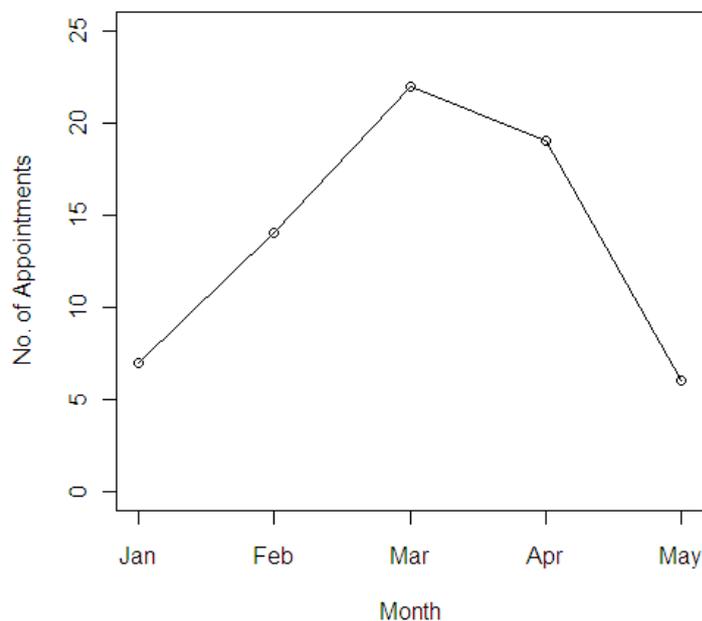

Figure 1: Appointments Utilised by Month

The students who did make use of this pilot service were predominantly final year undergraduate students seeking help with statistical analysis relating to their project (65% in the survey). The remaining students were postgraduate students either undertaking PhD research or master's? students working on a dissertation. These numbers are fairly representative of the proportions seen as part of the face-to-face SAS appointments offered at Loughborough University over this period.

4.2. Practical Issues

Approximately 75% of students in the survey reported that logging on to Elluminate, going through the audio set-up procedures and using Elluminate during the appointment, was either "Easy" or "Very Easy". However, over 60% of the students (16 out of 26) in the survey reported some technological issues during their session.

These technological issues were also reported by students at each institution as shown in Table 2 below, and therefore this appears to be a generic problem and not institution specific.

Table 2: Technological Issues Using Elluminate by Institution

Institution	Yes	No	Total
Birmingham City University (n=9)	66.7%	33.3%	100.0%
De Montfort University (n=12)	50.0%	50.0%	100.0%
University of Sunderland (n=4)	75.0%	25.0%	100.0%
Loughborough University (n=1)	100%	0.0%	100.0%
Overall (=26)	61.5%	38.5%	100.0%

These technological issues mainly related to audio or connection problems. The audio problems included issues such as the student's headset speakers and/or microphone not working correctly and a "swishy sound" on the line which may have been due to the quality of the connection or the quality of the headset. In addition, a feedback echo was often experienced by the statistics advisor when a student was using their in-built PC speakers rather than a headset. A pragmatic, if not completely satisfactory, approach to temporarily dealing with this problem was to ask the student to turn their microphone off whenever they did not wish to speak. This in turn, however, could cause problems with the flow of communication if they forgot to turn it back on again when required.

A time-delay in the speech being transferred over the network was also observed to present some problems with the flow of communication. There were occasions when the sound was reported to "drop" or disappear altogether, which again may be hardware and/or network issues rather than Elluminate specific. Finally, some students found that going through the audio set-up procedure in Elluminate was not always completely straight forward for them. Some connection problems and difficulties logging in to Elluminate were also reported. Lost connections appeared to be the main difficulty, particularly where a wireless connection was being used by the student. One issue the statistics advisor encountered when dealing with these problems remotely was in understanding what hardware the student was using and how they had this set-up.

It therefore seems apparent that not all students are comfortable with managing this type of hardware and software, even when written and video based instructions are provided and, in some cases, having also been taken through the process in advance during a screening interview. Language issues may have played some part in this problem, as a number of students experiencing this type of problem were overseas students.

A further problem can occur when a student is attempting to use a PC for which they do not have the rights as an administrator to make any changes that might be required when first logging in to Elluminate. These changes usually only relate to the installation of a short JAVA update, which occurs automatically when first logging in to Elluminate, but this can be prevented if these have been blocked by the owner of the PC.

One of the partner institutions reported several students cancelling their appointments after realizing that this was to be undertaken on-line. Confidence in using this type of service was given as the reason for cancelling. Given that some students may already be experiencing anxiety and stress in relationto their statistics query, the added issues relating to the use of unfamiliar technologies may be exacerbating their anxiety and perhaps should not be under-estimated in this context. It was clear, however, from those students who used the service, that their anxieties were often significantly reduced after completing their first appointment. This could perhaps be due to having both made progress with dealing with their statistics query and also having had the experience of successfully completing the on-line appointment.

These issues were often resolved during this pilot for second and subsequent appointments. However, these problems could be removed to a much larger extent if the student had access to a PC at their host institution, preferably in a quiet space. This would be further helped by having a dedicated headset for this PC with microphone that was known to function correctly with Elluminate and had previously been set-up correctly. The issue of confidence could also to some extent be overcome if the student was given prior instruction on using Elluminate with this PC before their on-line appointment. The instruction in the use of Elluminate would perhaps be best provided by a central contact at each host institution. This same person could also provide a screening function similar to that undertaken at some of the host institutions during this pilot, to ensure that the student's needs could be met via the on-line SAS. In the context of such an on-line service being shared across several institutions, its success would appear to be very much dependent on there being such a central contact at the host institution to manage some of the above problems locally as these are much more difficult for the statistics advisor to deal with remotely.

In terms of improving this type of shared on-line SAS beyond how it was organised in the pilot, just 27% of students in the survey indicated that improvements could be made. These improvements usually referred to either solving some of the technical issues reported earlier or allocating more time to the appointments. The earlier suggestion made with regard to an institution PC being available with instruction could potentially improve on the first of these two issues.

With regard to time allocation, the length of the appointments in the pilot was notionally set at 30 minutes. This is the length of time allowed for face-to-face appointments with the SAS at Loughborough University. Although 77% of the students completing the survey reported that this was about the right length of time, in practice the appointment was often allowed to over-run, particularly if there had been any technological issues with getting started such as those described above.

The remaining 23% of students felt that the appointments were too short. This experience would indicate that 30 minutes is insufficient and perhaps an hour is a more reasonable period to allow for each appointment when conducting these appointments on-line in this manner.

4.3. Pedagogical Issues

Amongst the students in the survey, 85% reported that they were able to obtain help with "Most" or "All" of their statistics problems and the remaining 15% reporting that they were able to obtain help with "Some" of their statistics problems. In addition, the statistics advisor also received a number of complimentary emails thanking her for allowing them to progress their understanding and their work. Furthermore, all but one student in the survey considered their overall experience of the service to be "Good" or "Very Good", and said that they would use this service in the future if there was no alternative source of support and would also recommend this service to a friend. This pilot would therefore appear to have clearly demonstrated that a shared on-line SAS is able to improve the learning experience for the students and provides a suitable support mechanism to enable their statistics advice needs to be met. This was the case for both final year undergraduate project students and postgraduate students.

The statistics advisor reported that during the appointments it made a huge difference to her ability to assist the student if the student had prepared for the appointment by emailing her in advance (as they were requested to in the instructions) with a short summary of their problem and what they were hoping to achieve from the appointment. However, Elluminate has an excellent facility to share applications, which means that statistical software such as SPSS or Minitab, or indeed Excel, can be shared simultaneously by both the student and the statistics advisor. Therefore, this does allow the statistics advisor to see the student's data during the appointment even if this hasn't been provided in advance of the appointment. In addition, both parties can also assume control of the application to manipulate and/or analyse the data.

The ability to share applications in this way was seen during this pilot study as one of the key strengths of the Elluminate environment for use in providing an on-line SAS. Furthermore, the fact that only one party need have the relevant software installed on their computer is also a significant strength, since this allows the statistics advisor for example to help the student with whatever software and particular version of that software the student is using.

The statistics advisor also reported that the types of questions asked by the students and the nature of the help and support they sought were similar across all three partner institutions. These requests typically related to the scenario of having collected data as part of a study or survey, perhaps via a questionnaire, but then being unsure how to begin analysing their data. Alternatively, it was common for students to have been asked by their supervisor to undertake a particular analysis, for example using SPSS, but not being sure how to do this. This often related to

undertaking a simple analysis such as a Chi-Squared test of independence, but the students may not have met this sort of technique during their earlier studies. Entering data into a package such as SPSS and organising their data was also another common theme. Another issue in that emerged was that students often leave seeking help until quite late into their work. These are, however, issues not specific to the provision of an on-line service, as these are also typical of the issues that arise during the face-to-face SAS appointments offered at Loughborough University.

5. Case Studies

This section contains three case studies, one from each partner institution, which are presented as answers to a series of common questions which were asked during interviews with these three students. The reason for presenting these case studies here in this way is to provide some illustrations of the overall experience of just some of these students in the pilot. These students were not selected randomly but were selected by their willingness to take part in these subsequent interviews.

Five students did take part in these interviews. However, the three selected for inclusion here provide anecdotal accounts of the experience of a broad range of students; one from each institution, one a final year undergraduate student, one following a taught master's programme and the other pursuing PhD research. The questions asked are included in the case studies below, along with the students' responses.

5.1. Birmingham City University

The student interviewed was following a part-time MA in Human Resource Management, and needed statistics help in relation to their dissertation which was to investigate the cultures affecting two different sales groups.

- What was the nature of your query?

  General stats advice throughout the process of doing my dissertation - from constructing the original questionnaire to analysing the answers using SPSS.

- Can you describe what you expected from the service?

  Not entirely sure - referred to the service by another member of staff who said we were the people to give stats advice.

- What was your overall experience of using Elluminate?

  Pretty good once you've got the instructions. The conversations with Mollie were all pretty good. Logging on was OK. There were a couple of short issues to do with bandwidth. Shared some files and the desktop a couple of times.

- To what extent did the stats expert end up advising/helping you with your original query?

  Very, very helpful! Had 3 appointments in the end. Mollie went out of her way to go over things, looking at different stages. Without her I would have been in a bit of a pickle.

- What are the features about the service that you found the most helpful/unhelpful?

  The actual demonstrations of using SPSS from Mollie - it can be a bit of a minefield if you don't know what you are doing.

- What improvements could be made to the service?

  A little more awareness would be good.

- Were there any issues with the booking system?

  Used a screening appointment - had problems booking it for some reason using the on-line booking system.

- If you first had a screening appointment, how effective was it?

  Screening appointment made sense and was effective. Got some information from Peter which helped me to think along the right lines by the time I spoke to Mollie.

- How do you think the on-line service compares with a face-to-face meeting?

  Both as useful as each other. You have to expect some services will be provided on-line in a modern world. In fact, the ability to swap files made it slightly more useful.

- If this support had not been available how would you have tried to solve your problem?

  Not sure - it would have been harder for me to find the time to come to the University to locate the right person. All my stats aware friends were busy.

- Are you aware of a demand for statistics support from other students on your course or research area that is not currently being met?

  Another student on my course made use of the service. Not sure apart from this.

- Do you have any other comments?

  Thanks to Mollie and Peter - big appreciation for helping me.

5.2. De Montfort University

The student interviewed was following a full-time BSc in Human Psychology, and needed statistics help in relation to their final year project.

- What was the nature of your query?

  I've collected a large quantity of data and wanted to know what to do with it. In total I had 63 variables.

- Can you describe what you expected from the service?

  I expected to get someone who would listen to my problem.

- What was your overall experience of using Elluminate?

  The first time it took over 30 mins to hear Mollie otherwise felt it was easy to use. Logging on was fine but the audio was the problem area as it took 30 mins to work out that my microphone was not on. Using Elluminate was fine and being able to share documents was very good.

- To what extent did the stats expert end up advising/helping you with your original query?

  Felt my query had been answered. I would not have managed on my own. Mollie got me to a position where I was able to do the statistics independently.

- What are the features about the service that you found the most helpful/unhelpful?

  The most helpful thing was being able to have the data set in front of both Mollie and myself so I could see where the problem was. Unhelpful was not being able to save what I? did with Mollie so we had to do it all over again.

- What improvements could be made to the service?

  Look at the instructions to students and highlight that you have to turn the microphone on.

- Were there any issues with the booking system?

  No issues.

- If you first had a screening appointment, how effective was it?

  Not done at DMU.

- How do you think the on-line service compares with a face-to-face meeting?

  No difference.

- If this support had not been available how would you have tried to solve your problem?

  Not sure I would have been able to solve the problem and felt I may otherwise have had to pay to get statistics lessons.

- Are you aware of a demand for statistics support from other students on your course or research area that is not currently being met?

  No.

- Do you have any other comments?

  None.

5.3. University of Sunderland

The student interviewed was in their first year of a research towards a PhD in Pharmacy Practice.

- What was the nature of your query?

  What kind of stats to use to analyse data from a questionnaire.

- Can you describe what you expected from the service?

  Someone to guide me on what kinds of statistics are applicable, and to give advice on improving my questionnaire.

- What was your overall experience of using Elluminate?

  OK. It's just like Skype. I would have preferred to have been able to see Mollie. No problems with logging on as Bernadette was there for first session. The audio was fine as was the overall experience of Elluminate.

- To what extent did the stats expert end up advising/helping you with your original query?

  It was a great help to get feedback from an expert in questionnaires - she gave me ideas which was really helpful in building confidence and improving my questionnaire.

- What are the features about the service that you found the most helpful/unhelpful?

  Mollie's positive feedback - she really helped build confidence. She made it a positive experience. I could not identify any unhelpful features.

- What improvements could be made to the service?

  A longer trial or a more permanent service. Better advertising to PhD students e.g. weekly email reminder of service. Basic reference guides from an expert on how to conduct interviews, how to write proper interview questions, how to do probing questions.

- Were there any issues with the booking system?

  None.

- If you first had a screening appointment, how effective was it?

  A screening appointment was not necessary. Initial communication was via email with Bernadette - it was clearly a query for Mollie.

- How do you think the on-line service compares with a face-to-face meeting?

  I prefer face to face. It's Important to be able to see the other person's expressions to build up trust. If this is not possible then I would prefer on-line with a web cam.

- If this support had not been available how would you have tried to solve your problem?

  Probably go to a statistician or resort to asking friends/peer group.

- Are you aware of a demand for statistics support from other students on your course or research area that is not currently being met?

  Yes, but this service wasn't advertised well enough.

- Do you have any other comments?

  I would like this to be long term so that I could refer to Mollie as my research progresses. It is useful for students to be able to arrange an appointment at "any time" from anywhere in the world. For master's students the summer is the time they need statistics support.

6. Discussion and Recommendations

This pilot study has demonstrated that an on-line SAS is able to offer a practical alternative to an institution specific face-to-face SAS if suitably experienced staff are not available locally. In addition, the pilot study has shown that it is feasible for this type of service to be shared by a number of institutions. This might be an option that institutions wish to consider in order to share the financial costs of providing such a service.

This pilot study has also illustrated that Elluminate is a suitable tool for the provision of an on-line SAS, particularly in view of its very easy to use application sharing facility. This allows for easy sharing of statistical software that only needs to be owned either by the student or the advisor, and allows the student to also obtain help with the specific version of the software that they own.

However, Elluminate is not without its problems, which mainly relate to difficulties some students experience with setting up their audio devices so that they can hear and speak during the on-line session. In addition, some connection problems were experienced, although these are likely to be related more to the type of internet connection being used by the student, rather than being related to the use of Elluminate per se. One solution to overcoming most of these problems, in the context of a shared on-line SAS, is through the provision of a dedicated PC at each partner institution that the student can use for this purpose, preferably located in a quiet location, with a suitable headset and cable internet connection which is known to function correctly.

The provision of a member of staff at each partner institution to act as a local contact for the student is vital in order to offer practical support if the student does experience any technical problems. In addition, it is recommended that where possible, consideration be given to providing access to a PC at the local institution which uses the university's wired internet connection, and which also had a dedicated headset. Assuming that this system had been previously tested with Elluminate, this would allow some of the technical problems that were experienced in this pilot, particularly in relation to audio and connection problems, to be avoided to a reasonable degree.

The provision of local staff support, and if possible a local PC resource, may also alleviate some of the anxiety that some students clearly have with using this type of technology when they are perhaps already experiencing anxiety relating to their need for statistics advice and support.

Furthermore, this same member of staff could also provide a screening process to ensure that the student's needs are suitable for an on-line appointment with the statistics advisor, and to provide initial instruction in the use of Elluminate. This would also provide an opportunity to guide the student to prepare for the on-line appointment by emailing the statistics advisor in advance with a short summary of their problem and what they were hoping to achieve from the appointment. This member of staff could also serve as the local focal point for this service so that they

could liaise with staff across the university to raise awareness amongst the students at that institution.

The appointments themselves should be notionally one hour in length, to allow for technical problems that may be encountered when first logging on and also to allow for the fact that the flow of communication between the student and the advisor is slower on-line compared to face to face. The advisor will also require additional resourcing time to prepare for the appointment and to undertake follow up work. This follow up work, for example, may involve keeping a record of the appointment and also engaging in some email correspondence following the appointment, if the student has any subsequent questions that can be answered easily by this means.

We believe that this type of shared service would offer universities a viable alternative means of providing a SAS without incurring the financial costs of resourcing a SAS solely dedicated to their own institution. Given the new climate of student access to information relating to learning support and the proposals set out in the UK Government's Higher Education White Paper on "Students at the heart of the System" (2011), it would seem sensible to further consider this type of support provision and so we look forward to being able to take this idea forward.

Appendix A: Elluminate Instructions Provided to Students

Thank you for booking an appointment to speak on-line with a statistics advisor as part of our pilot project to provide a shared on-line statistics advisory service.
This sheet contains:

- Summary details of the project
- Instructions for how to prepare for the appointment
- Instructions for how to log-in to the on-line meeting room and how to obtain and set up a headset with speakers and microphone.

Once you have completed your appointment it would help us greatly if you could complete the short on-line follow up questionnaire that is available at https://www.survey.lboro.ac.uk/hestem (takes just 2 minutes to complete). This will help us improve the service and also to make a case for further funding to extend this service to other universities to potentially benefit many other students.

Summary of the Project

The aim of this pilot project is to assess the feasibility of several universities sharing a common on-line statistics advisory service where face-to-face help and advice is not available directly on campus.

This pilot involves a single statistics advisor (Mollie Gilchrist) providing on-line support to students from Birmingham City University, De Montfort University and the University of Sunderland. Mollie has many years experience in teaching and providing statistical help to students and funded research projects. She has recently retired from Coventry University, teaching statistics and research methods, with a quantitative focus. She has particular experience in using MS Excel and SPSS for quantitative data analysis, and, last year, helped with over 100 enquiries for statistical support at Coventry University.

This pilot on-line service uses an Elluminate web-meeting room which is provided by Loughborough University as part of this project. Your appointment with Mollie will take place on-line in this Elluminate room. Logging into the Elluminate room is easy and requires no software installation on your PC. All you require is a USB headset with a microphone to plug into your PC to enable you to talk on-line with Mollie. If you do not have your own USB headset then this can be borrowed from *contact details of the relevant staff member was provided here.*

Preparing for the Appointment

Also prior to the appointment please email Mollie with a short summary of what statistics advice or help you hope to obtain from the appointment. If you require this help as part of a project or research then please add some brief details of the project you are working on. Please email this information to: *Statistics Advisor's email address was provided here*. It is also suggested that prior to the appointment you test that you can log-in to the Elluminate room and try the set-up procedure for your headset.

Logging in to the Elluminate Room

To log-in to the Elluminate room, simply type the following url into your usual web browser:

url to log into the Elluminate room was provided here.

Or if you are viewing these instructions electronically you should be able to simply click the above link.

This will take you to the screen shown below:
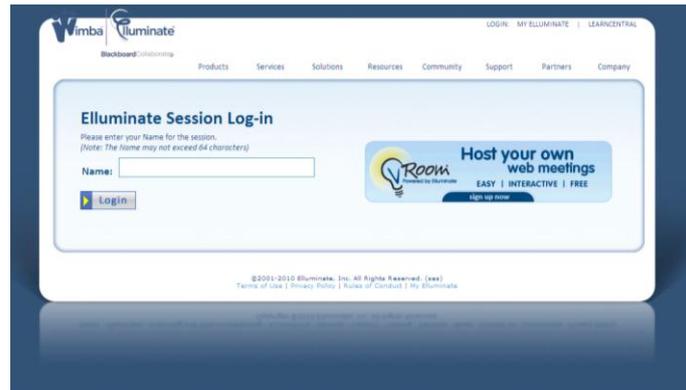
Simply type in a name you wish to be known as in the Elluminate room and click the Login button. You may be asked to agree to a JAVA update being installed on your PC, which usually only takes a few moments but you will need to agree to this to access the service.

Once in the room you will see the following Screen
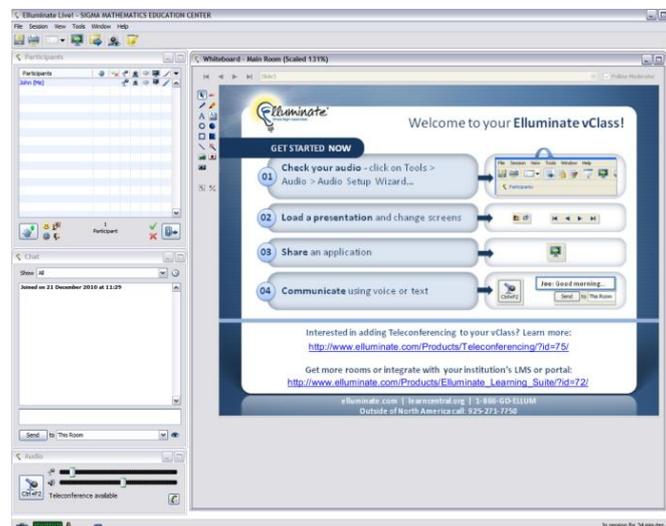
The first thing to do once you are in the room is to check that your headset is functioning correctly. To do this click on the TOOLS menu at the top of the Elluminate screen and select AUDIO followed by AUDIO SETUP WIZARD.

This brings up a dialogue screen to allow you to select your audio output device (Note that if you are using a MAC instead of a PC It may look slightly different):
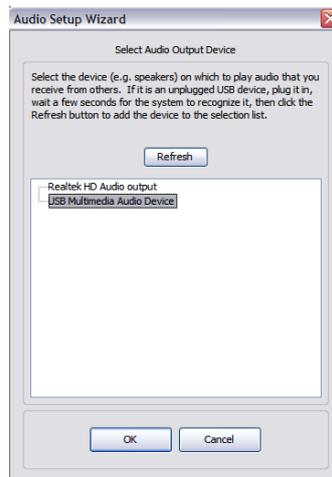

Essentially you need to make sure that the USB headset device is selected (as illustrated above) for use as the output device. Then click on OK and follow the instructions to test and set up your headphone speakers and microphone.

On the day of your appointment, you will need to click on the microphone button to ensure that your microphone is turned on so that Mollie can hear you when you speak. This button will turn yellow once you have clicked on this to indicate that your microphone is on. Clicking on the same button again turns it off.

If prior to the appointment, you wish to learn more about the functions and facilities available using Elluminate, then this can be found via the HELP menu and following the links to participant help for Version 10.
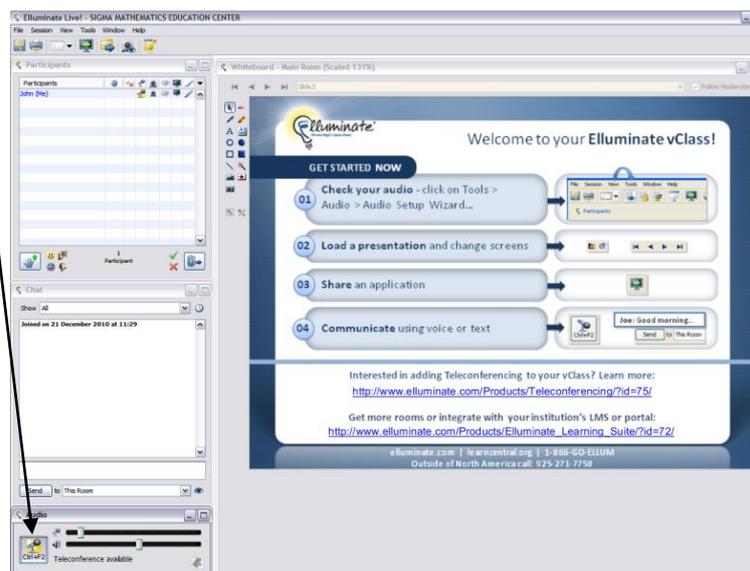
To leave the session, click on the SESSION menu and select LEAVE SESSION.

Finally please then remember to complete the short on-line follow-up questionnaire at https://www.survey.lboro.ac.uk/hestem.

If you require any further help with the details contained in these instructions, please contact *details of the relevant staff member was provided here.*

Appendix B: Summary of Survey Results

(n=26 unless stated)

Question 1	Very Difficult	Difficult	Undecided	Easy	Very Easy	Total
a) Logging in to Elluminate was:	0.0%	19.2%	3.8%	26.9%	50.0%	100.0%
b) Going through the audio set-up in Elluminate was:	0.0%	11.5%	3.8%	46.2%	38.5%	100.0%
c) Using Elluminate was:	0.0%	11.5%	7.7%	34.6%	46.2%	100.0%

Question 2	Yes	No	Total
Where there any technological issues using Elluminate?	61.5%	38.5%	100.0%

Question 3	None	Some	Most	All	Total
To what extent were you able to obtain help with your statistics problem(s)?	0.0%	15.4%	65.4%	19.2%	100.0%

Question 4	Too Short	About Right	Too Long	Total
The length of the appointment (30 minutes) was:	23.1%	76.9%.	0.0%	100.0%

Question 5	Inconvenient	Undecided	Convenient	Total
The scheduled day/.time of the appointment was:	0.0%	0.0%.	100.0%	100.0%

Question 6	Very Poor	Poor	Undecided	Good	Very Good	Total
How would you rate your overall experience of obtaining statistics help via this on-line service using Elluminate?	0.0%	3.8%	0.0%	30.8%	65.4%	100.0%

Questions 7 to 10	Yes	Undecided	No	Total
7. Would you use this type of on-line service in the future if there was no alternative source of support?	96.2%	0.0%	3.8%	100.0%
8. Would you recommend this service to a friend?	96.2%	0.0%	3.8%	100.0%
9. Could the service have been improved?	26.9%	38.5%	34.6%	100.0%
10. Do you think there is a need for a physical face-to-face provision of a statistics advisory service at your university?	42.3%	19.2%	38.5%	100.0%

Question 11	BCU	DMU	UofS	LU	Total
Which university are you from?	34.6%	46.2%	15.4%	3.8%	100.0%

Question 12	Undergraduate	Postgraduate	Total
What type of student are you?	65.4%	34.6%	100.0%

Question 13	Business	Health and Life Sciences	Applied Sciences	Not Stated	Total
Please state the name of your faculty or subject area	34.6%	30.8%	26.9%	7.7%	100.0%

Note that 5 students stating their subject area as pharmacy have been included in the Applied Sciences, whilst 2 students indicating their subject area as psychology have been included in the Health and Life Sciences.

Question 14 (n=25)	Web	Poster	Leaflet	Staff	Friend	Other	Total
How did you find out about this pilot on-line statistics advisory service?	8.0%	0.0%	0.0%	72.0%	8.0%	12.0%	100.0%

References

Department for Business, Innovation and Skills (2011) *Higher Education: Students at the Heart of the System*, Cm 8122, London: The Stationery Office.

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