STUDENT SURVEY SECOND SEMESTER CS1022B 2003-2004

Conducted & Prepared by

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Perceived overall quality of the module in the second semester
Students were invited between 14 May and 23 June 2004 to fill out a WebCT questionnaire regarding the second semester of CS1022B. Students had just received their grade and feedback on the Statistical Report coursework. Of 176 students on this module 54 took the opportunity to provide us with feedback. These students were on average modestly positive about the overall quality of the module in the second semester (Figure 1).

Answer	Frequency Distribution	
poor	4	█████
fair	19	████████████████████████
good	24	██████████████████████████████
very good	7	████████
not applicable	0	

Figure 1: Response on the question "All things considered, how would you rate the quality of the second semester of this module?"

Students' comments regarding the second semester were mixed. Some regarded it as too boring where others regarded it as an interesting challenge (see box on the right).

The questionnaire was set up according to the elements of the Model of Student Learning (Cannon and Newble, 2003), and also included 20 questions of the Revised Study Process Questionnaire (R-SPQ-2F) (Biggs, Kember & Leung, 2001) to study the students' learning approach.

A factor analysis was conducted on the results[1], because of the high number of questions and the many correlations between the answers. The factor analysis identified 7 factors, which can be described as follows:

1. *Perceived usefulness of Material Support* (usefulness lecture handout, discussion board, example exam questions, study guide, lab session notes, usability WebCT)

> **Students' comment related to second semester on a whole**
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> Student 2: *parts of the statistics work too easy.* (sic)
>
> Student 11: *Found the module boring and not very interesting and not very well organised in contract to Module CS1020B & CS1021B.* (sic)
>
> Student 17: *Top module. It was very interesting and challenging.* (sic)
>
> Student 26: *The second semester was very boring, maybe that's because I did Stats at maths A Level.* (sic)
>
> Student 31: *I find statistics one of the most practical subjects in day to day life. … and over i found this module very usefull.* (sic)
>
> Student 50: *this module was a challenge for me which i think was good and challenging.* (sic)
>
> Student 51: *stats is rubbish remove it from CS1022b put something else, waste of time n money, peace.* (sic)
>
> Student 52: *I struggle with maths and found this unit the hardest to get my head round* (sic)

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[1] The factor analysis did not include the following questions:
- The individual R-SPQ-2F questions, instead the four subscales were taken (Deep Motive: Intrinsic Interest, Deep Strategy: Maximise Meaning, Surface Strategy: Fear of Failure, Surface Strategy: Narrow Target, Rote Learn)
- The overall module quality
- Grade for coursework
- Educational background
- Access to PC
- Student's interest in the module

2. *Lecturer directions* (interest in subject, usefulness lecture, usefulness feedback coursework, usefulness Problem Sheets)
3. *Perceived usefulness practical part of the module* (labs, seminars, self-tests)
4. *Attendances* (lectures, labs, and seminar)
5. *Surface Approach*
6. *Deep Approach*
7. *Ease of the subject matter* (usefulness template Stat Report, familiarity with the subject, level of difficulty)

These 7 factors were stepwise entered in a regression analysis to predict the rating of the overall quality of the second semester of the module. The results shows a model ($F_{(4,25)}=9.95$; p. <0.01; Adj $R^2 = 0.55$, Std. Error 0.548) which includes 4 factors: Perceived usefulness of material support ($\beta = 0.51$), Lecturer direction ($\beta = 0.41$), Ease of subject matter ($\beta = -0.34$), and Deep approach ($\beta = 0.28$). This suggests that students look at the module's material, the lectures and the feedback they received. But also, the quality of the module is rated higher for students that are more inclined to apply a deep learning approach, and for whom this semester subject was new.

Teacher's approach
The teacher's approach in the second seminar can be described as a series of weekly lectures supported by lab and seminar sessions. An MANOVA on the students rating of the usefulness of these meeting reveal a significant difference ($F_{(2,49)}= 13.16$; p. < 0.01) between them. On a scale from useless (1) to very useful (4), students rated the usefulness of the lectures on average 2.46, the labs 2.48, and the seminar session 2.72. Some students made remarks about the noise in the lectures, but also about the pace of the lecture. For some it was too fast, while for others it was too slow. Analysis on the reported attendance of these meetings also shows an significant difference ($F_{(2,51)}=10.56$; p. <0.01). However, this time the median for lectures and lab attendance was in the category 61-80%, whereas for the seminars the median was the category 41-60%. This seems a paradox. Students rated usefulness of seminars higher than lectures and lab sessions, but did attend the seminars less often than lectures and lab sessions. A possible explanation is the time of the seminars. Labs were on Monday. Lectures were on Wednesday, but the seminars were given throughout the week including Friday afternoon.

Students' comment related to teacher's approach

Student 11: *Thought that* <name lecturer removed> *was going over the lectures very fast and the seminars in the 2nd semester were not very good. Because there were only two teacing assisstants and if you had a question you had to wait long time to get un answer.* (sic)

Student 13: *It would be better if lecturers actually got the people who are talking to SHUT UP during lectures, and were more forceful when they do day it. It is extremely frustrating trying to pay attention, when there are people sitting there not paying an ounce of attention to the lecturer, but instead insist on talking throughout the entire lecture.* (sic)

Student 15: *The Assistant teacher for second semester outweighed the quality from the one in the first semester. I give an A for performance for this semester on regards for a C in the first semester.* (sic)

Student 25: *I found the lectures very useful, but was appalled by the levels of talking that were allowed to contine unchecked. In the end I stopped going to the lectures as I just could not hear the lecturer over the incessant chatters. Sadly this seems to be a common problem with Brunel lectures, and one that needs addressing.* (sic)

Student 26: *The second semester was very boring, maybe that's because I did Stats at maths A Level. I generally found the lectures boring because they were all delivered in exactly the same way. The lecture hand outs contained most of the information you needed and so there really wasn't any point in going to them… The seminars were useful, but the lab sessions were pointless.* (sic).

Student 46: *the stats lectures could've been simplified a bit more and explained in a more comprehendible way. I discovered that the lectures go too monotonously and one easily loses the thread. To avoid that a single question shouldnt be repeated 5 times before moving on to the next one but it should be explained better at the first place so that it wouldnt need that much repetition and with easier and more straight forward examples so that people understand the main point and then jump into more difficult ones. The slides were boring too. One cannot compare them to the ones in discreet maths in the first term, which were gorgious and fun to look at. I understand that the topic is more difficult but i still think they can be improved. I basically got so bored of the lectures that i started studying at home only.* (sic)

Student 47: *The seminars in an absolutely boring manner and even though I had tried to stay always awake I did not succeed in the task every single time. I feel that statistics should be treated with more respect to mathematical-minded people who prefer a formal explaination rather than 35 examples. In other words I would have liked to see formal definitions alongside examples. I also feel that if content would have been delivered by someone more lively (or in a more lively manner) the whole semester would have been more digestible.* (sic)

Student 50: *the only coments that i would like to give is that we should have more of the help sessions for the mathematics and the examination preparations sessions.* (sic)

Student characteristics

Table 1 shows the educational background of the students and the grade they received for the Statistical Report. The data collected does not indicate a difference (χ^2(16, N = 52) = 21.06; p. > 0.05) for the background education on the grades.

Table 1: Educational background and Grade received for Statistical Report

| | | \multicolumn{5}{c}{Which grade did you receive for Statistical Report coursework?} | Total |
|---|---|---|---|---|---|---|---|
| | | F | D | C | B | A | |
| What is your educational background? | A levels | 0 | 2 | 3 | 11 | 9 | 25 |
| | BTEC | 0 | 0 | 1 | 2 | 3 | 6 |
| | GNVQ | 1 | 0 | 2 | 1 | 2 | 6 |
| | Access | 0 | 2 | 2 | 0 | 8 | 12 |
| | Other | 0 | 0 | 1 | 0 | 2 | 3 |
| Total | | 1 | 4 | 9 | 14 | 24 | 52 |

Since the module involved the practical use of a computer to conduct statistical analysis, students were asked about their access to a PC outside the lab sessions. Two students responded with never or sometimes, whereas 51 students replied with regular. The access to a PC correlated with the perceived usefulness of the lecture handouts (r = 0.290*). Still the lecture handouts are provided both on paper as electronically. Presumably, students confused it with the lecture slides, which are also provided in WebCT.

Context characteristics

The students rated the usefulness of the material (discussion board, mathlectics self-test, lecture handouts, lab session notes, seminar problem sheets, example exam questions, study guide, template statistical report coursework, feedback on statistical report) on average between on the one hand some parts useless and some part useful (2) and on the other hand very useful (4) (Figure 2). The perceived usefulness of the WebCT discussion board seems to correlate with the perceived usefulness of the lab sessions (r = 0.327*), the attendance of the lab session (r = 0.508*), perceived usefulness of the lectures (r = 0.343*) and attendance lectures (r = 0.374*). This seems to suggest that the discussion board does not substitute lectures or labs, but supports them instead.

This year for the first time, students were offered a document template they could use when creating Statistical Report coursework. The idea behind providing the template was to overcome procedural

errors, and make clearer what was expected in this assignment. The analysis of the survey result showed a negative correlation (r = -0.503**) between how difficult the students rated the module and the usefulness of the template. As was commented by one student, the template was for some students to restrictive, although the students did not have to use the template.
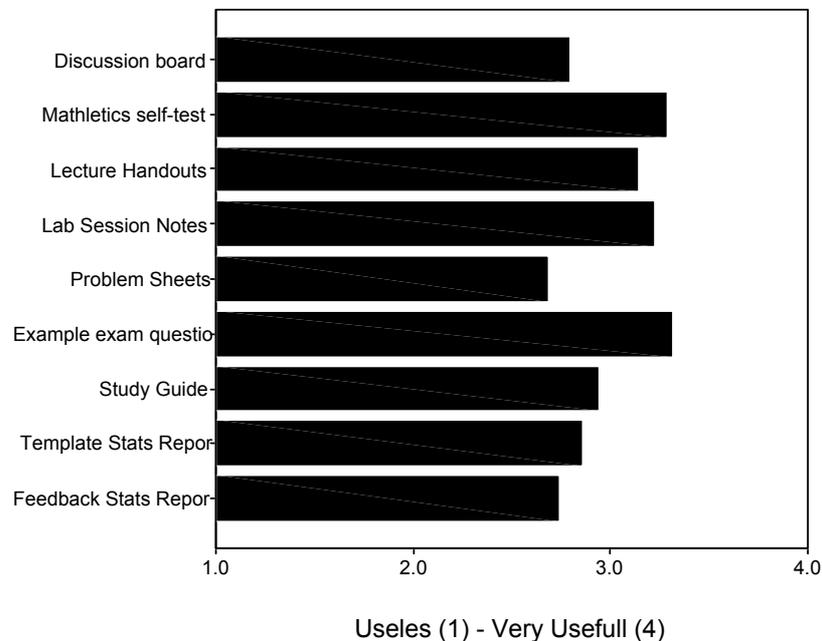
Figure 2: Uselessness/Usefulness of the element of the learning context.

Students' comment related to context characteristics

Student 15: *Well done for this semester excellent idea to give the lab work at the beginning of the semester Finished all the labs before even starting the second semester :P gave me more time to concentrate on other modules.* (sic)

Student 26: *The lecture hand outs contained most of the information you needed and so there really wasn't any point in going to them. .... One thing that would be a big help is when you are uploading the lecture slides, could you put them in PDF format so that we can just print them off. Some of them are, but most are not. It saves time and is so much better when you are limited to a dialup connection. It might also be useful to put the answers to last years exam paper onto WebCT. That way we can at least see if we are on the right track.* (sic)

Student 31: *I would find it more usefull if extra lab notes were given regarding many different aspects of statistical analisis tolls* (sic)

Student 34: *it doesn't provide answer sheets, but we need to print them from webct.* (sic)

Student 47: *What was required for the statistics report was not sufficently clear and when the matter was gone through AFTER we had submitted it in I realised how the way I replied to some questions in it were off topic.* (sic)

Approach to learning
Based on the 20 questions of the Revised Study Process Questionnaire (R-SPQ-2F) (Biggs, Kember & Leung, 2001) the score of each student was calculated on 4 scales: Deep Motive: Intrinsic Interest, Deep Strategy: Maximise Meaning, Surface Strategy: Fear of Failure, and Surface Strategy: Narrow Target, Rote Learn. On average the students in the survey scored significantly $(F(1,48)=188.03; p. < 0.01)$ higher on the overall Deep approach scale than on the overall Surface Approach scale. Figure 3 shows the break up into the two sub-scales.
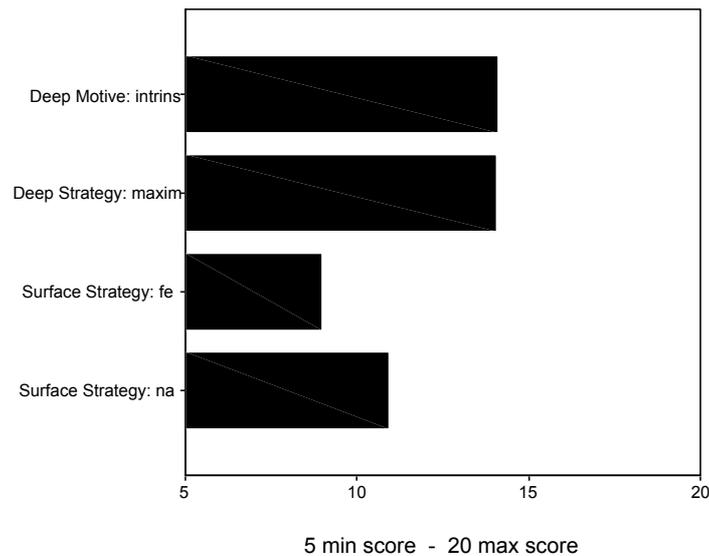
Figure 3: SPQ-SF Scores

Analysis of the correlation between the sub-scales and the different items of the questionnaire showed that the Deep Approach is correlated with the rating of the overall quality of the module, students' interest in the module and the Mathletics self-test. Students who seek understanding and meaning attended the seminars more often.

On the other hands students that were more motivated by fear of failure rated the module as more difficult, but also received on average a lower grade for the Statistical Report coursework. Interesting is also that the students that apply a surface strategy were more inclined to rate the overall quality module higher, as well as the usefulness of the lectures, and the discussion board. It seems that these students look and found directions from the lecturers, whereas students who favour a more deep approach, wanted and found opportunity for self-testing and self-discovery.

> **Correlations between learning approach subscales and items in the questionnaire.**
>
> The Deep Motive: Intrinsic Interest:
> - Overall quality of the second semester (r = 0.352*)
> - Student interest for the second semester (r = 0.309*)
> - Usefulness Mathletics self-test (0.295*)
>
> The Deep Strategy: Maximise Meaning:
> - Attendance seminars second semester (0.393*)
> - Usefulness Mathletics self-test (0.277*)
>
> The Surface Strategy: Fear of Failure:
> - Perceived level of difficulty second semester (-0.358*)
> - Grade Statistical Report coursework (-0.334*)
>
> The Surface Strategy: Narrow Target, Rote Learn:
> - Overall quality of the second semester (0.427**)
> - Usefulness lectures second semester (0.302*)
> - Usability WebCT (0.337*)
> - Usefulness WebCT discussion board (0.342*)

Learning outcomes

The students were asked to enter their grade they received for matletics test 1, matletics test 2, and statistical report coursework. Almost every respondent received an A grade for the first two pieces of coursework, for the statistical report the grades were more divers. The 7 factors, established in the factor analysis, were stepwise entered in a regression analysis to predict the grade

> **Students' comment related to learning outcomes**
>
> Student 2: *coursework needs to be more challenging and especially with the fact that there is a template to use, everyones work is the same. Mathletics test were useless, easy for students to collaborate to get answers right so no sence of achievement in getting a higher grade.* (sic)

for the Statistical Report coursework. The results shows a significant model ($F(5,24)=8.46$; p. <0.01; Adj $R^2 = 0.56$; Std. Error = 0.67), which includes the following 5 factors: Surface Approach ($\beta = -0.462$), Attendances ($\beta = 0.415$), Perceived usefulness material support ($\beta = 0.319$), Ease of the subject ($\beta = 0.294$), and Perceived usefulness practical part of the module ($\beta = -0.254$). It seems that students who were more inclined to apply a surface approach were less effective in obtaining a high grade. But also attending of lectures, labs or seminars related positive with grade. Students that did less well on the coursework, perceived the practical part of the module as more important than student that did well on the coursework. This can be seen as that weaker students looking for more practical support. The appreciation of the material support also had a positive relation on the grade. This can be seen that usefulness/accessibility of the material can be a key factor in supporting learning.

Conclusion survey and suggestions for improvement
The students' response on the lectures are mixed. For some it is not challenging enough, because of the lack of new material, whereas the more surface oriented students still see the lectures as very useful. A possible solution might be to incorporate more Information System and Computer Science oriented examples in the lectures. This makes that students familiar with the statistical subject, still have something new in this semester. Furthermore, this can also motivate the students' learning as it becomes clearer how statistics could be directly applied, encouraging a more deep approach. Applying IS/CS examples in the module's material might also be considered. This will make the material more accessible for the students, which again might have a positive affect on their learning.

Although students regard the seminars as useful the attendance is low. Rescheduling of the time of the seminars seems needed, away from Friday afternoons.

The discussion board seems to support the lectures, labs and seminar. However, it seems to be particular appreciated by students that apply a surface approach. A more effective way of using the discussion board maybe by ending each lecture with an exam question and discuss the solutions on the discussion board. This might encourage surface oriented students to engage into more deep learning strategy.

References

Biggs, J., Kember, D. and Leung, D.Y.P. (2001). The revised two-factor study process questionnaire: R-SPQ-2F. *British Journal of Educational Psychology, 71*, 148-149.

Cannon, R. and Newbe, D. (2003). *A Handbook for teachers in Universities and Colleges* (4th ed). Glasgow: Kogan Page Ltd.