

## Virtual Revisions Classes Using a VLE: an initial review

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**Keywords:** *examination revision, VLE, learning technologies, learning incentives*

### Introduction

Revision classes in preparation for the final examination are seen by both students and lecturers as an important moment in the overall structure of a module. Students have the opportunity to clarify issues concerning the structure of the examination paper, to discuss issues that have proved difficult to understand and to go over specific topics. Lecturers have the opportunity to provide a 'closure' to their work by highlighting the learning outcomes that will be tested in the examination as well as informally testing the students' overall level of preparation and by providing some explanations of difficult topics.

The role of revision classes and of incentives in the learning process of students has not been widely investigated in the literature (see, for example, Hyland (2003) and Marcellus (2000)). The focus here is on my own practice. I organise revision classes for all the modules where students are assessed by examination. However, my experience has generally been negative. Students tend to come to classes having done little actual revision. Rather than enquiring about specific well-focused difficult points, they ask for a full topic or theory to be explained again. Revision classes then become a set of 'mini' lectures where I repeat the same material I covered in lectures throughout the semester. The 'incentive structure' seems to be somewhat distorted: the burden of work rests with the lecturer rather than with the students.

In order to re-establish the appropriate distribution of incentives I have devised a 'scheme' that I call 'Virtual Revisions.' It makes use of WebCT and it attempts to induce students to actively engage in revision. The paper explains how the scheme works and provides an evaluation of its effectiveness. A statistical analysis based on data collected in the academic year 2002/3 reveals that participation in the 'Virtual Revisions' had a limited impact on examination performance.

### The Structure of the 'Virtual Revision' Scheme

The Virtual Revision scheme was developed as part of the Business Economics module. This is an intermediate level module that runs in both semesters and that is taken by around 200 students enrolled on business related degrees. In 2002/3

students were assessed 100% by examination. I tend to organise revision classes in the two weeks preceding the examination. However, as explained before, it is out of the frustration in running these classes that I developed the 'Virtual Revision' scheme.

The scheme works as follows: Towards the end of the semester I distribute a set of notes containing details about the structure and objectives of the examination paper as well as a set of questions that closely reflect the type of questions that could appear in the examination paper. The students are told to attempt at least some of the questions in the handout as practice in preparation for the examination. The reward for engaging in this activity is the possibility to access the model answers for the revision questions on WebCT. However, the model answers are not visible to students unless they actively engage in the revision activity by showing me their actual efforts. I check that the attempts are serious and show clear learning and revision. Once I am satisfied that this is the case, I use the 'selective release' option on WebCT to give the student access to the model answers.

The scheme has two main aims. First of all, it attempts to induce students to actively engage in revision in order to properly prepare for the examination. Secondly, by providing the model answers, it gives students the opportunity to understand the actual quality and focus that is required from them in dealing with the examination questions. My hope is that a combination of 'carrot and stick' would induce the students to actually 'do' things such as writing short essays and solving problems rather than just reading books and notes without doing any practical activity. The idea is to have a sort of contract that binds the student to perform a 'task' in exchange of a reward from the lecturer. The concept of a 'contract' between student and lecturer is suggested by Shapiro (1984) when the case method is used in teaching.

### **Assessing the Effectiveness of the 'Virtual Revision' Scheme**

I introduced the scheme for the first time in the academic year 2002/3. I monitored its implementation and carried out some analysis aimed at testing the degree of success of the scheme. Table I (below) summarises some descriptive statistics concerning the performance in the module.

In semester A, the overall performance was not particularly good with 62.9% of the class passing the module, an overall average mark of 39.4% and a standard deviation of 18.3%. Out of the 159 students who took the examination, about one quarter (23.3%) participated in the 'Virtual Revision' scheme. Their performance was on average much better, with an average mark of 52.3% and a substantial majority (81.1%) passing the examination. The average mark of the students not participating in the revision scheme was 35.5% and the difference in performance among the two groups of students is statistically significant at the 1 percent level. The distribution of grades was also better with 40.5% achieving a grade B or above.

**Table I. 2002/3 Semester A and B summary of descriptive statistics**

<b>Statistics</b>	<b>Semester A</b>	<b>Semester B</b>
Students taking examination	159	101
Students participating in Virtual Revision	37	25
Overall Average Mark	39.4% (st.dev. 18.3%)	42.7% (st.dev. 16.6%)
Average Mark of students participating in Virtual Revision	52.3% (st.dev. 18.6%)	49.5% (st.dev. 16.4%)
Average mark of students <b>not</b> participating in Virtual Revision	35.5%	40.4%
Students achieving grade B or above in module	22 (13.9%)	15 (14.9%)
Students achieving grade B or above among virtual revision participants	15 (40.5%)	7 (28%)
Average of Year I performance of students <b>not</b> participating in virtual revision	52.9%	52.3%
Average of Year I performance of students participating in virtual revision	60.5%	56.9%

The semester B cohort shows similar results. The overall performance was better than in semester A with nearly three-quarters (72.3%) successfully completing the module with an overall average mark of 42.7% and a standard deviation of 16.6%. Again, about one-quarter (24.8%) of the students submitted some work for revision and their average mark was 49.5% compared to the average mark of 40.4% among the non-participating students. The performance of the two groups of students is statistically significant at the 5 percent level. The distribution of grades was also better among the 'scheme-participating' students with 84% of them passing the module and 28% achieving a grade B or above. However, a key factor in the better performance of the semester B cohort is that the majority of students were part-time (working) evening students. Experience from past years shows that part-time evening students have a greater interest in their studies. These are normally mature students who keen on their education and this attitude towards working harder can explain the better performance over the semester A cohort.

This first analysis reveals two interesting facts. First of all, a rather limited number of students actively participated in the 'Virtual Revision' scheme. There are various reasons that could explain this trend:

- the students do not regard the scheme helpful for their preparation;
- the students felt confident about their ability to deal with the examination, so felt that no additional support was needed;

- other assessment commitments prevented the students from finding the time to participate in the scheme;
- students engage in ‘denial’ behaviour not recognising (or avoiding to recognise) that substantial revision work needs to be undertaken. In this respect there is an argument to suggest that this is the result of modularisation and the very short period of time that students now have to absorb and assimilate subject matter.<sup>[1]</sup>

A second result emerging from the analysis shows that the students who participated in the scheme performed better on average than the other students. Whether this is a confirmation that the scheme is successful in improving performance is, however, open to interpretation. In fact, it is possible that the scheme triggers a ‘self-selection’ process so that only the ‘good’ students engage with the scheme. An attempt to address this issue is made in the next section where some regression analysis is used to test the link between examination performance, participation in the scheme and the students’ quality.

#### *Examination Performance and Revision*

To test the impact of the revision scheme a regression analysis is performed where the examination performance is regressed against the participation in the virtual revision. The results of this analysis for the semesters A and B cohorts are shown respectively in columns (1) and (2) in table 2.

**Table 2. Regression for Assessment Mark**

Independent Variables	(1) Semester A	(2) Semester B	(3) Semester A	(4) Semester B
Constant	35.85 (23.4)***	40.42 (21.7)***	-38.4 (-3.28)***	-17.47 (-1.61)
Revision	16.27 (4.98)***	9.09 (2.43)**	5.94 (1.69)*	7.24 (1.87)*
Average Year I			1.42 (6.56)***	1.12 (5.51)***
R <sup>2</sup>	0.137	0.056	0.387	0.412
Observations	159	101	117	62

Note: OLS method. Dependent variable Examination Mark. Independent variables: Revision (dummy variable), Average Year I (average of year I marks). t-tests in brackets. \* Denotes a parameter which is statistically significant at 10%, \*\* at 5%, and \*\*\* at 1%

In both regressions participation in the revision scheme seems to play a significant role in explaining the students’ examination performance. The estimated average mark of a student participating in the revision scheme is about 52% in semester A and about 50% in semester B. Columns (3) and (4) show the results of the

regression after controlling for the ‘quality’ of the students<sup>[2]</sup>. ‘Quality’ is measured by the average performance in year I. Obviously this is not an exact indicator of ability but it is the only measurable factor available. Being a ‘good’ student explains most of the examination performance while participation to the scheme is less (but still) significant. A student involved in the scheme would perform, on average, about 7% points better than the other students.

#### *Probability of Success and Revision*

The available data can also be used to test whether participation in the revision scheme enhanced the probability to pass the examination. Table 3 summarises the main results:

**Table 3. Regression for Probability of Pass**

Independent Variables	(1) Semester A	(2) Semester B	(3) Semester A	(4) Semester B
Constant	0.32 (1.79)*	0.77 (3.13)***	-7.62 (-3.59)***	-6.33 (-2.42)**
Revision	1.06 (2.31)**	0.89 (1.48)	0.25 (0.40)	1.54 (1.37)
Average Year I			0.15 (3.79)***	0.14 (2.70)***
Goodness of fit	0.628	0.723	0.744	0.790
Observations	159	101	117	62

Note: Logit method. Dependent variable is: Pass (dummy variable). t-tests in brackets.

\* Denotes a parameter which is statistically significant at 10%, \*\* at 5%, and \*\*\* at 1%

In semester A the revision scheme seems to have played a significant role in enhancing the probability of success by giving students an 80% probability of passing the examination. On the other hand, the estimated coefficient for the semester B cohort is not statistically significant. Columns (3) and (4) in table 3 show the results of the regression after controlling for the students’ quality<sup>[3]</sup>. The revision coefficients are statistically insignificant to suggest that the main explanatory factor in the students’ probability of success is given by their ‘quality’. Good students tended to have a higher probability to perform better in the examination irrespective of whether they participated in the virtual revision scheme.

### **Summary and Conclusions**

The paper has presented a scheme aimed at inducing greater participation and effort by the students in their revision activities by means of online exercises. An overall

assessment of the scheme should distinguish between 'operational' and 'effectiveness' issues.

From an 'operational' point of view, the management of the scheme involves the following costs and benefits:

- a) there is a one-off cost resulting from the need to write the material supplied to the students participating in the scheme.
- b) There is a further cost related to the time spent dealing with the material sent by the students.
- c) No more 'physical' revision classes are organised.

A general evaluation of the scheme's effectiveness has been provided above. The main points emerging from this analysis are:

- a) There is relatively limited participation of the students in the revision initiative, an issue that is being further investigated at present.
- b) Participation in the 'virtual revision' plays a limited role in enhancing the examination performance or the probability of success. 'Good' students perform well in the final examination irrespective of their involvement in the revision activities.
- c) The statistical analysis suffers from some limitations. In particular, the regressions are mis-specified since they omit other variables that might be considered to influence performance.

Various studies have shown that factors such as age, gender, part-time employment and teaching and learning experiences play a significant role in explaining students' performance. The role of age in explaining students' approaches to learning has been investigated by, among others, Dickson *et al.* (2000), Richardson (1995) and McGivney (1996). The different performance in education of male and female students has been examined by Burton (1990) and Dowling (1998). The negative academic consequences of paid employment have recently been explored by Johnston (2001) and Paton-Saltzberg and Lindsay (1993). In a recent work on the determinants of students' performance in a first year undergraduate IT and mathematics module, Pokorny and Pokorny (2003) find that gender, entry qualifications, part-time work and age have an impact in explaining performance. Ongoing research into this VLE project is addressing these issues.

## Notes

1. I have to thank my former colleague Michael Pokorny for suggesting this point to me. He discusses some of the pedagogical implications of modularisation in a recent paper (Pokorny and Pokorny, 2003).
2. The sample size in this analysis is smaller because data on the year 1 performance is not available for all students. Direct entries into year 2 and students who progressed from an HND programme to a degree programme are excluded from the sample. In order to make the results more comparable, regressions (1) and (2) in table 1 have been run by excluding the direct entry students. The results do not change significantly and only the revision coefficient in regression (2) increases its statistical significance.

3. As before, in order to make the results more comparable, regressions (1) and (2) in table 2 have been run by excluding the direct entry students. The results do not change significantly with the exception of the revision coefficient in regression (2) that becomes statistically significant at the 10 percent level.

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