The Use and Effectiveness of *Oral Tests in Physics*

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1. Introduction

1.1 Aim of the Research Study: **to investigate whether students can achieve better in Physics if they are assessed by means of an oral rather than a written test.**

1.2 Physics and Assessment in Malta

- Physics became a compulsory subject for all secondary students in Malta – early 80s (Bonnici, 1994)
- Physics became a requirement for entry to studies at the post-secondary Sixth Form.
- Although this requirement was eventually changed to any Science subject (Biology, Chemistry or Physics), Physics is still compulsory in many State schools, mainly because of logistical reasons and the qualifications and training of the teachers employed.

- In State schools, students are formally assessed twice a year: mid-year + end-of-year written exams.
- Duration of Physics written exams = 1½ to 2 hours, depending on school year.
- At the end of secondary school, students can sit for the Secondary Education Certificate (SEC) level (16+) examination – an external national examination, by the MATSEC Board of the University of Malta, equivalent to the British GCSE.
- Final grade based on: 85% for the written part (two papers) + 15% from school based assessment (15 practical reports assessed by school-teachers).

1. Introduction

1.3 Different Types of Assessment

- **The traditional types of tests and examinations are not the only way to assess learners**

- McColskey and O'Sullivan (2000): traditional methods of assessment do not really challenge and involve the students.
- Ahmed, Pollitt and Rose (1999): written examinations cannot be effectively and successfully used with all students, and these examination types are not a good assessment tool for low achievers.
- Black and Harrison (2004): "*If science teachers want to find out what students understand in science rather than just what they know and can recite, then the learners need to be challenged by activities that make them think.*"

- Alternative modes of assessment: portfolios, journals, projects and lab reports, etc. (Rosenstein, 1996)
- McColskey and O'Sullivan (2000): other ways of assessment, such as interviews, which can be considered as oral examinations.
- Not all methods can be effective in every situation, BUT . . . it is one's responsibility to try, find out and use the right assessment tool/s for the particular students and class.

1. Introduction

- **1.4 Oral Assessment**
- **Oral examinations have a number of benefits.**
- Waterfield and West (2005): oral assessment is more inclusive than the traditional type of examinations, more interactive and . . .
- Joughin and Collom (2003). ". . . the opportunity in oral assessment to probe understanding through follow-up questions can encourage deep approaches to learning."
- Andreasson (2005): oral tests are more flexible as the teacher can give the student a second chance to answer correctly. Oral assessment prepares learners for future, real-life situations at work.
- Singh (2010): there must be a link between assessment and real-life situations, and oral tests "enable the learner to identify with, interact with and therefore understand the material better because of the continual interaction and discussion with their peers and the assessors."
- Oral examinations can be used to get a better picture of the level and extent of understanding of pupils.
- Gardner (1999): new modes of assessment should give more importance to the process of learning rather than the product, and make use of the diverse tools available to test different forms of intelligences.

2. The Methodology

- The Maltese school system = State, Church and Independent schools.
- Research study carried out in state schools, 26 Form 4 students = 13 boys and 13 girls.

- The students had a traditional end of topic written test. Topic tested = 'Momentum'.
- Participating students informed one week in advance that they were going to have the test.
- Written test set and answered (as is the normal practice in Malta) in English.
- One week following the written test – a 10 (to 15) minute oral test, very similar to the written. Oral test, carried out on an individual student-by-student basis, students could also answer in Maltese.

- Following the oral test – a questionnaire to each student.
- A number of interviews on the use of oral assessment in Physics – the four class teachers, and the Principal Subject Area Officer (PSAO) responsible for Physics at MATSEC.

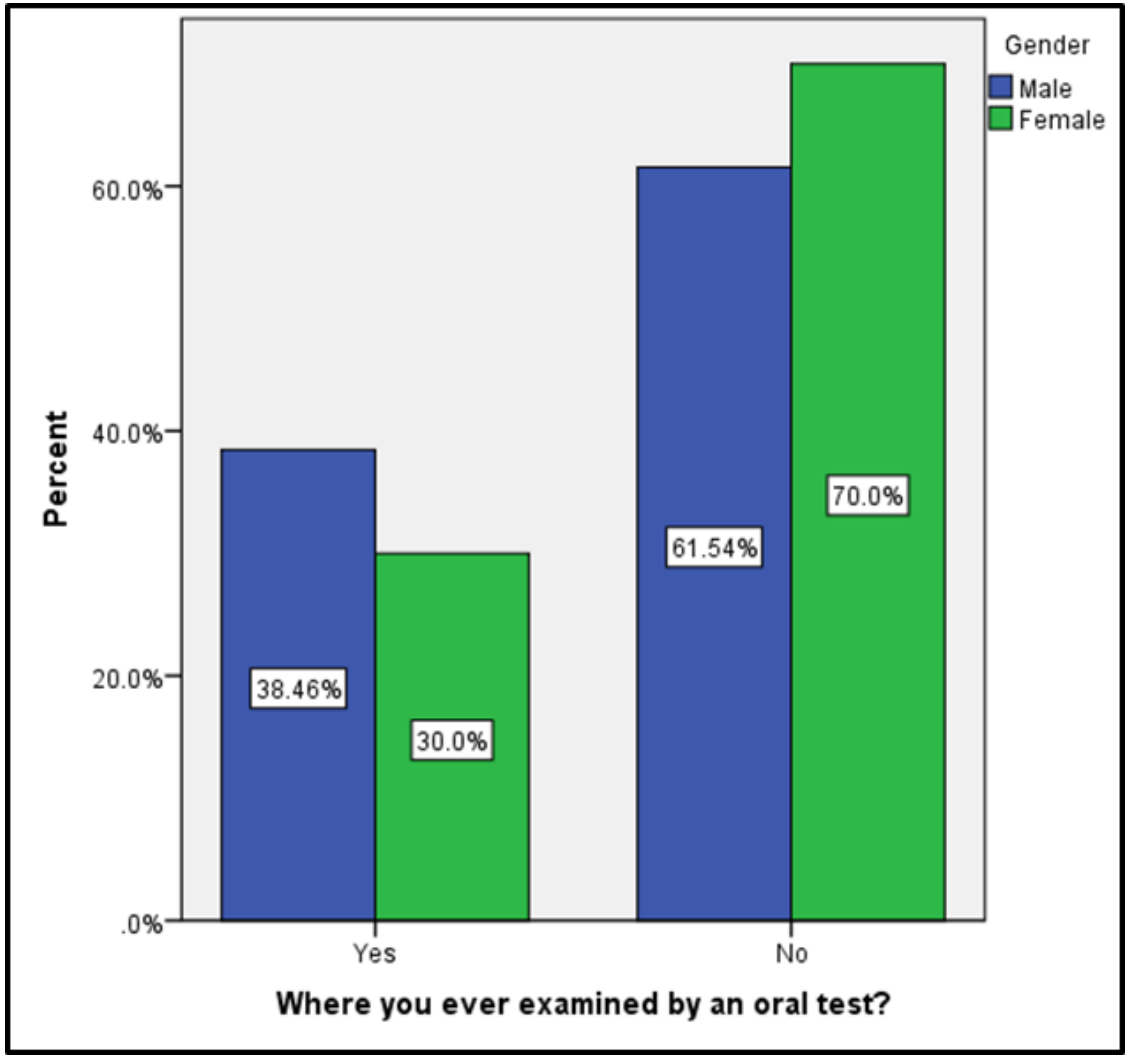
- Analysis of results of the written and oral tests (using SPSS) – to investigate any differences in outcome between the two assessment modes.
- Analysis of questionnaire - Likert scale responses with values 1 to 3, corresponding to uncomfortable to comfortable or disagree to agree, with 2 always representing a neutral stand.

3. The Results

3.1 Previous Experience of Oral Tests

Summary of responses to 'Where you ever examined by an oral test?'

Response		Gender		Total
		Male	Female	
Yes	Count	5	3	8
	% within gender	38.5%	30.0%	36.4%
No	Count	8	7	15
	% within gender	61.5%	70.0%	65.2%



The four class teachers stated that they had never set an oral examination, main reason (given by all the teachers) being that it is time consuming, in line with Andreasson (2005) and Huxham, Campbell and Westwood (2012).

3. The Results

3.2 Mean Scores and Gender Differences

- The participating students performed **significantly better in the oral test** – mean scores: oral = 41.5%; written = 20.7%
- Girls performed better than boys in both tests . . .
  - girls: mean written = 31.5%, mean oral = 50.8%
  - boys: mean written = 9.9%, mean oral = 32.1%.
- These results contradict Cole's (1997) data – although there is a reduction of the gap with respect to the past, males still performed slightly better in Science than females.

- Written test preferred by 30.8% of males and 53.8% of females.
- Thus the girls preferred written rather than oral examinations, as opposed to the boys.

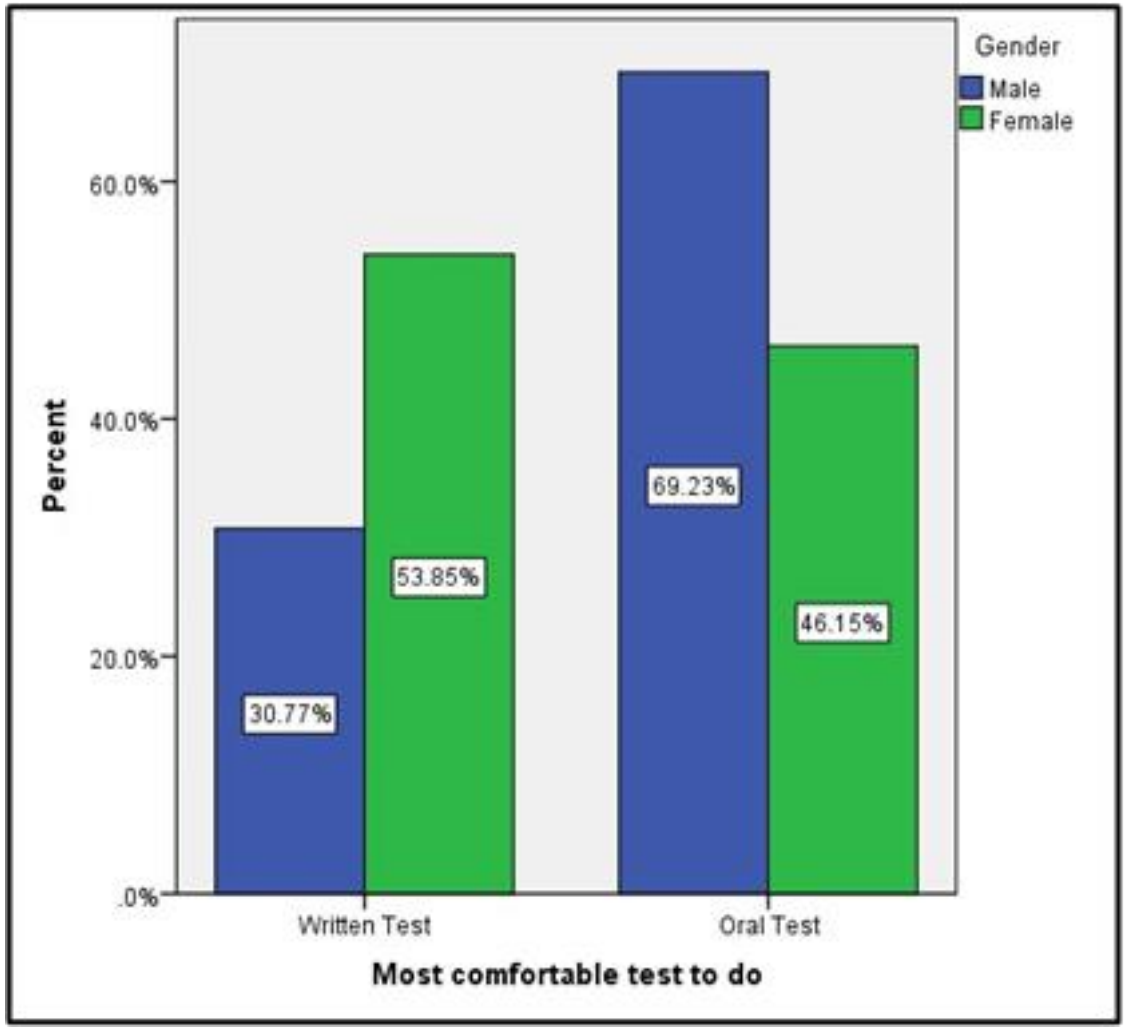
- Not many candidates gave reasons for their preference for mode of assessment – only 11 out of the 26.
- Most common reasons for the girls' preference for written tests: they express themselves better in writing; they felt shy during the oral test.
- One male participant: he prefers oral exams as the examiner reads the question for the candidate.

3. The Results

3.2 Mean Scores and Gender Differences

Summary of responses to ‘Which test did you find more comfortable? ’

Response		Gender		Total
		Male	Female	
Written Test	Count	4	7	11
	% within gender	30.8%	53.8%	42.3%
Oral Test	Count	9	6	15
	% within gender	69.2%	46.2%	57.7%



3. The Results

3.3 Oral assessment in the Future

- From questionnaire – only 44% of the participants preferred a higher use of oral exams in Physics, in line with the ideas of the interviewees.
- Although many interviewees (either class teachers or indirectly involved in educational or assessment process) highlighted the advantages of orals, no one advocated a 100% oral exam.
- It was emphasised that it is not easy to change the present modes of assessment, especially for formal and high stakes examinations (as in the 16+ SEC exam).

4. Conclusion

- **No clear and distinctive preference for oral assessment mode.**
- **BUT a clear difference in performance, especially by the lower achievers, in traditional written tests.**
- **Although participants declared that they do not find any problem with written tests, a considerable 53.8% affirmed (in the questionnaire) that they felt comfortable being assessed orally.**
- ***It may be high time to start making use of various modes for more effective and fruitful methods of assessment and educational measurement.***

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