Appropriate settings and supports for diagnostic testing in third level mathematics

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Outline

- Motivation for the study
- Background on diagnostic testing in DCU/NUIM
- Research questions
- Methodology
- Results
- Discussion
Motivation for this study

- Diagnostic testing: common element of mathematics support across third level

- Aims of Diagnostic Testing (staff perspective)
  - determine students’ mathematical knowledge
  - identify students who need extra support
  - encourage students to avail of supports
Motivation for this study

- Do students recognise these intentions?
- How do students feel about diagnostic testing?
- Irish Mathematics Learning Support Network (IMLSN):
  - Questionnaire to explore students’ perspectives of diagnostic testing
Background to Diagnostic Tests

- NUIM Department of Mathematics and Statistics
  - Test during first week of term
  - Handed back in class
  - Answers posted up online
  - Failing students signed up for online Mathematics Proficiency Course (MPC) and advised to use the Mathematics Support Centre (MSC)
  - Additional weekly workshop available
Background to Diagnostic Tests

- DCU Mathematics Learning Centre (MLC)
  - Test during Orientation Week
    (in information session on MLC)
  - Solutions available on day of test
  - Results emailed to students
  - Failing students advised to access support (refresher courses, MLC drop-in sessions)
Research Questions

- Do students think that Diagnostic Testing (DT) is a good or bad idea?
- Does the present format of DT achieve the staff objectives?
- Does DT encourage or discourage students in terms of engagement with support; with maths generally?
Questionnaire

- Anonymous questionnaire developed by IMLSN members from DCU, NUIM and University of Limerick (UL)

- Twenty questions:
  - seven profiling questions
    (all closed questions)
  - remaining questions aimed at answering principal research questions
    (mix of open and closed questions)
Implementation

- Questionnaire issued to first year students in DCU and NUIM half-way through semester 1, 2009-2010

- Paper-based in DCU; online in NUIM
  - Aware of limitations of online but data largely corresponds with paper-based
Implementation

- NUIM: Online questionnaire (Moodle)
- NUIM: 205 returns
  - 131 mathematics compulsory;
  - 74 mathematics a choice

- DCU: Questionnaire issued in class
- DCU: 662 returns
  - Mathematics compulsory for all
Profiling Questions

- Q1 – Identify degree programme
- Q2 – Identify relevant module(s)
- Q3 – Gender
  - [414 M, 451 F, 2 no response]
- Q4 & Q5 – LC Maths level and grade
  - [363 higher level, 469 ordinary, 20 other, 13 no response]
Profiling Questions

- Q6 – Time at which student dropped from higher to ordinary level maths (if they did so)
- Q7 – Mature student or not
  [53 identified themselves as mature students]
Opinion Questions

- Now review responses that address these research questions:
- What opinions do students have in relation to practical aspects of implementation of diagnostic test (timing, location, announcement of test)?
- What views do students have on additional supports provided following diagnostic test?
Q11 – Was the room where you took the test suitable?

☐ Perhaps mundane, but could have important bearing on students’ ability to properly engage with test

☐ DCU: 24% of responses were negative:
  ■ Too small – people had to sit on the floor
  ■ Too many people – I couldn’t concentrate

☐ NUIM: 12% negative responses
  (Test held during Wk 1 lecture)
Q11 – Was the room where you took the test suitable?

☐ Majority of responses positive:
  - *Atmosphere wasn’t serious because...the room was so big. Which was a good thing.*

☐ Large venue, numbers of students present reported to both enable and discourage cheating!
Q9, 10, 18 – Timing of test

- 71%: timing of test was suitable
- 75% did not know about test beforehand
  - Test unannounced in both DCU/NUIM
  - Some ‘leakage’ of news about the test accounts for 25%
- 90%: sufficient time to complete test
Q14 – Were you advised to avail of additional supports because of your results in diagnostic test?

☐ 30% indicated they had been

☐ Students who obtain below predetermined mark in test deemed to be “at-risk”, advised to avail of various support mechanisms

☐ Made clear to them that advice based on performance in diagnostic test
Q15 – If so, did you avail of these supports?

☐ DCU: 60 out of 165 respondents who were advised to attend said that they actually did so

☐ NUIM: 43 out of 58

☐ Overall 291 DCU students and 224 NUIM students were advised to avail of support; not all these students completed survey
Q15 – If so, did you avail of these supports?

- Highlights difficulty of promoting and maintaining high levels of engagement in students who have been identified as needing to avail of mathematics support

- Difference: possibly due to different mode of delivery of survey – online in NUIM; ‘closer’ to maths support provision
Q16 – Please comment on support available to students after diagnostic test

<table>
<thead>
<tr>
<th>Response Category</th>
<th>DCU</th>
<th>NUIM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>141</td>
<td>109</td>
</tr>
<tr>
<td>Negative</td>
<td>6</td>
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<td>-</td>
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<tr>
<td>Information Comment</td>
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<td>8</td>
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<tr>
<td>Don’t Know</td>
<td>16</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>264</td>
<td>123</td>
</tr>
</tbody>
</table>
Q16 – Please comment on support available to students after diagnostic test

- 68% of 387 responses positive – but 480 students did not respond
  - confidence levels weren’t high when we started our maths course, and even after the test. but as we all attended the maths support centre, and workshop, we could understand things a lot better
  - excellent help available to students through the support offered by the MLC
Q16 – Please comment on support available to students after diagnostic test

☐ Curious anomaly: 95 of 264 DCU respondents interpreted the question as a request for information about supports available: only 8 of 123 NIUM respondents did so.
Conclusions 1

- Students’ responses indicate that DT’s delivered in appropriate manner, and students feel follow-up is sufficient

- Confirms that supports available in both institutions are well advertised and known to students
Conclusions 2

- Suggests the issuing of diagnostic test to identify areas of weakness and to promote supports in place is successful strategy.

- This view further supported by our general inductive analysis of responses to open questions on DT’s (Ní Fhloinn et al., 2012).
Conclusions 3

- However, also clear that significant number of students advised to avail of support do not do so
  - Well-documented concern reported elsewhere, e.g. Pell and Croft (2008)
Conclusions 4

- Burke et al. (2012) report on monitoring scheme introduced in 2010-11 in NUIM (poster at SMEC)

- Engagement with support of at-risk students contacted as part of monitoring scheme increased significantly
Questions?

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- http://supportcentre.maths.nuim.ie/
References

