Appropriate settings and supports for diagnostic testing in third level mathematics

Eabhnat Ní Fhloinn & Brien Nolan

CASTeL, Dublin City University (DCU)

Ciarán Mac an Bhaird

National University of Ireland Maynooth (NUIM)

Presented by: Gráinne Burke (NUIM)

Centre for the Advancement of Science Teaching and Learning

CASTeL

NUI MAYNOOTH

Ollscoil na hÉireann Má Nuad

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

Response Category	DCU	NUIM
Positive	141	109
Negative	6	5
Mixed	6	-
Information Comment	95	8
Don't Know	16	1
Total	264	123

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?

- eabhnat.nifhloinn@dcu.ie
- brien.nolan@dcu.ie
- ciaran.macanbhaird@nuim.ie

- http://www.dcu.ie/maths/mlc/index.shtml
- http://supportcentre.maths.nuim.ie/

References

- Burke, G, Mac an Bhaird, C. & O'Shea, A. (2012) *The Impact of a Monitoring Scheme on Engagement in an Online Course.* Teaching Mathematics and Its Applications: International Journal of the IMA, to appear.
- Ní Fhloinn, E., Mac an Bhaird, C. and Nolan, B (2012). *Students' Perspectives on Diagnostic Testing.* In preparation.
- Pell, G. & Croft, T. (2008). *Mathematics support – support for all?* Teaching Mathematics and its Applications, 27, 167-173.