Issue 2
October 2014

Dudley College

DUDLEY Insight

THE MATHS CHALLENGE

This is one of a series of papers aimed at providing our stakeholders, both internal and external, with up-to-the-minute information on how we are strategically responding to local and national challenges. The papers may be of interest to many relevant stakeholders including parents, employers and the Local Enterprise Partnership.

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1 INTRODUCTION

There is a strong national focus on our ability as a country to raise the maths skills and aspirations of young people and adults, which we fully subscribe to. The purpose of this paper therefore is to provide stakeholders with information on how the college is addressing the maths skills of its students to ensure that they have the skills that employers are looking for.

2 CONTEXT

2.1 Dudley College has a long history of supporting students to develop their maths skills. Historically, the focus was on key skills (Application of Number) for young people and numeracy for adults. There was a small amount of A Level maths provision and students who had a D grade or less in their GCSE maths had the opportunity of a retake.

2.2 During the past 5 years, key skills (Application of Number), became functional maths and functional maths qualifications have replaced the National Test in Adult Numeracy. In total, in 2013/14, over 1,000 classroom-based students achieved a maths qualification, 142 received additional support with their maths in the Learning Hub and 27 had support in the workplace. In addition, over 700 apprentices achieved functional maths qualifications as part of their framework.

2.3 Breakdown of maths enrolments over 3 years:

Maths qualifications	2011/12	2012/13	2013/14
Functional Maths	864	1050	878
GCSE Maths	80	102	71
AS Maths	20	47	58
A level Maths	12	12	13

2.4 Over a number of years, much work has been done to improve the maths skills of staff, to develop the ability of vocational lecturers to embed maths into their lessons and to deliver functional maths qualifications to their students. 39 staff have achieved maths qualifications, 12 have achieved the Level 4 'Embedding Maths in a Vocational Curriculum' and 8 have achieved a Level 5 specialist qualification in teaching numeracy. Over 50 lecturers, mainly from vocational areas, now deliver functional and GCSE maths qualifications.

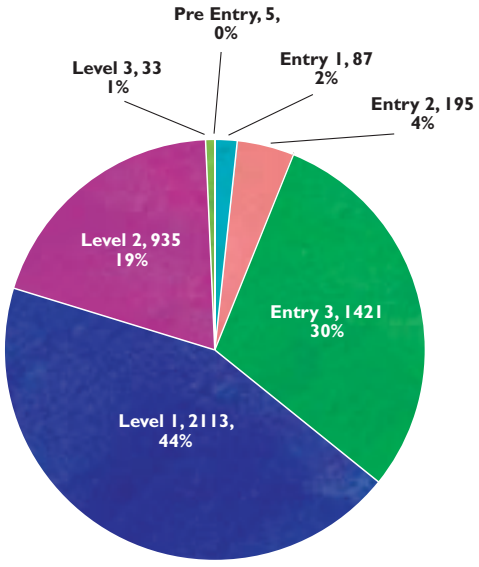
3 THE CURRENT CHALLENGE

3.1 Successive governments have sought to address the issue of our relative underachievement nationally in maths. The OECD Survey of International Literacy and Numeracy Standards (2013) ranks the UK as 21st out of 24 for numeracy skills. This statistic is borne out by the fact that many young people and adults come to the college with weak maths skills. The chart below shows that, based on initial assessment results for 2013/14, 81% of all students came to the college with maths skills below Level 2.

3.2 In order to ensure that all school leavers continue to improve their maths skills when they progress to college (specifically those who did not achieve at least a GCSE grade C), the funding of their study programmes is now dependent on them working towards maths qualifications.

3.3 For 2014/15, enrolment data shows that over 1,000 young people entered the college with a grade D or below in GCSE maths. Initial assessment results show that many of these students are achieving at entry level or Level 1and are clearly a long way from achieving a grade C or above at this point. On the basis of the skills that students arrive with therefore, the challenge to improve their GCSE grade is enormous. Many have enrolled at college to pursue their vocational aims and the need to continue to develop their maths skills is not high on their agenda.

Adult students often enrol at college having not used any maths skills for a long time. They are often more motivated to succeed, which is reflected in their success rates.



2013/14 maths initial assessment analysis

4 OUR RESPONSE

4.1 In 2009 a 'Skills for Life' strategy was created, which included maths, English, and IT skills. Over the years, this has been updated to reflect current priorities and we now have in place an English and Maths Policy which is supported by a comprehensive action plan. A cross-college steering group meets termly to monitor progress. The college operational development plan includes actions which specifically relate to English and maths. These cascade down to curriculum managers who work with their teams to ensure they meet the priorities within their area.

4.2 There is a management structure in place to ensure that we effectively manage our maths provision at all levels, for both young people and adults. Job descriptions for each post reflect specific responsibilities, most of which are enhanced posts with hours remitted from teaching in order to fulfil additional duties.

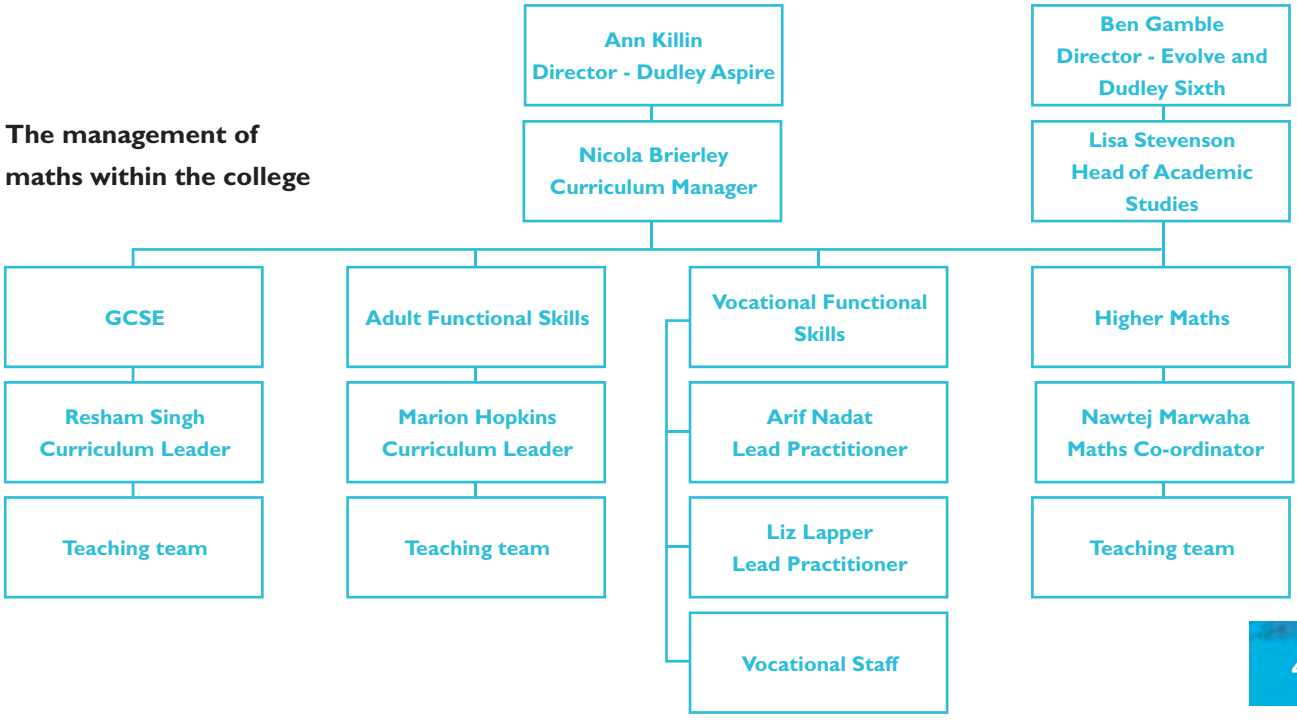
4.3 Approximately 45 vocational lecturers across college deliver functional maths qualifications (from entry level to Level 2) to full-time 16 to 18 year olds. They are supported by 3 lead practitioners for maths, who ensure students are on the right level of course, mentor staff, deliver customised staff development, internally verify all entry level portfolios and peer observe functional maths lessons. This team works closely with the Outstanding Practitioner (OP) team which carries out teaching and learning observations and also develops teaching resources for staff to use.

In addition, 5 lecturers deliver functional maths to adults on part-time programmes. Classes run day and evening at all levels, both in college and in the community. 5 lecturers deliver to apprentices and adult students in the workplace.

6 lecturers deliver GCSE maths to mainly 16 to 18 year olds but we have a growing cohort of adults on Access to Higher Education and pre-Access programmes as well as adults who come to college just to gain their GCSE maths qualification.

There is a team of 4 maths instructors who support students on mainstream courses with their underpinning maths skills. Students are taught in the Learning Hub on either a 1:1 or small group basis in weekly timetabled sessions with an option to attend additional drop-in sessions. In addition, 1 instructor works in-company with work-based students.

The management of maths within the college



5 PROGRESS TO DATE

5.1 As a college, we are totally committed to improving the maths levels of our students. Right from the Principal's induction talks delivered to all full-time students and apprentices, maths is given a high profile. All students are shown a video which emphasises the importance of maths skills and complete diagnostic and functionality assessments to ensure that we are able to pinpoint areas for development.

5.2 All functional maths students have access to a wide range of on-line resources, on Blackboard and through bksbLIVE, which delivers on-line learning based on individual diagnostic assessment and tracks progress which can be viewed by lecturers.

5.3 Staff development has been absolutely key to improving functional skills success rates. It has given staff increased confidence to deliver to their students and some have gone on to gain professional qualifications. Weekly 'Outstanding Practice in Teaching' (OPT) sessions were introduced a year ago and 23 staff attended at least one of the sessions on how to embed maths during the 2013/14 academic year.

5.4 All functional maths success rates are above the national benchmark and for 19+ students they are well above at Levels 1 and 2. External verifier reports regularly identify outstanding practice.

5.5 Where curriculum teams have fully engaged with the lead practitioner team, functional maths results are better. In 2013/14, maths lead practitioners focused on work with the construction team, as previously engagement had been poor. This has transformed the confidence of the construction lecturers to embed maths in the curriculum and deliver functional maths qualifications. (The embedding of maths skills is where vocational lecturers use naturally occurring opportunities to develop students' skills. By linking functional skills with students' interests in specific occupational sectors and with practical work-related activities, the importance of these skills is repeatedly reinforced).

5.6 Improving attendance of students at functional and GCSE maths classes is a challenge but with the introduction of a new attendance monitoring procedure in 2013/14, there is evidence to show that attendance is improving.

	2011/12	2012/13	2013/14
Functional maths	88.0%	82.9%	84.1%
GCSE maths	83.0%	64.6%	87.5%

Maths attendance 16-18 year old students

Functional skills mathematics			College			National rate
Age	Level		2011/12	2012/13	2013/14	2012/13
16-18	1	Starts	724	701	523	
		Success %	78.9%	81.2%	77.2%	71.7%
	2	Starts	42	50	47	
		Success %	64.3%	62.0%	66%	62.5%
	Total	Starts	766	751	570	
		Success %	78.1%	79.9%	76.3%	70.1%
19+	1	Starts	79	277	216	
		Success %	78.5%	82.3%	84.7%	72.2%
	2	Starts	19	22	41	
		Success %	73.7%	59.1%	97.6%	69.0%
	Total	Starts	98	299	257	
		Success %	77.6%	80.6%	86.6%	71.3%
Overall total		Starts	864	1050	827	
		Success %	78.0%	80.1%	79.6%	70.5%

5.7 GCSE results over the past 3 years show a clear improving trend. The high grade success rates (A* to C) for GCSE maths are of particular note when compared against a national backdrop of only 7% of post-16 students achieving a grade C or better[1].

GCSE maths results show a marked improvement in 2013/14. This was partly a result of much more rigorous initial assessment which ensured that only those students who had adequate underpinning skills were enrolled on GCSE maths, hence the lower student numbers. Those who did not were enrolled on functional maths at Level 1 or 2, whichever was most appropriate. There was also improved use of on-line resources to support learning beyond the classroom.

GCSE maths		College			National rate
Age		2011/12	2012/13	2013/14	2012/13
16-18	Starts	41	66	50	
	Success %	70.7%	89.4%	92.0%	85.3%
	High Grades %	27.6%	12.9%	35.4%	
19+	Starts	39	36	21	
	Success %	82.1%	80.6%	90.5%	80.3%
	High Grades %	37.5%	32.4%	70.0%	
Total	Starts	80	102	71	
	Success %	76.3%	86.3%	91.5%	83.1%
	High Grades %	32.8%	19.8%	45.6%	

High grades (A*-C) shown as a percentage of completers

5.8 An analysis of functional maths data shows that many students progress from entry levels to Level 1 and from Level 1 to Level 2. On average, students who completed in 2013/14 achieved 0.84 of a full grade improvement.

[1] Department for Education, Statistical First Release: Level 1 and 2 attainment in English and maths by 16-18 students, 2012/13, issued 11 September 2014

5.9 The 2013/14 results at Level 3 show a marked improvement in AS Level maths, although they are still slightly below the national rate. Overall, A2 Level maths results are also a little below the national rate but all A2 students achieved at least a grade C, which is a very good result.

Dudley Sixth for A levels

GCE AS Level maths		College			National rate
Age		2011/12	2012/13	2013/14	2012/13
16-18	Starts	20	43	58	
	Success %	70.0%	41.9%	72.4%	74.8%

GCE A/A2 Level maths		College			National rate
Age		2011/12	2012/13	2013/14	2012/13
16-18	Starts	9	10	11	
	Success %	88.9%	90.0%	90.9%	94.5%

5.10 The embedding of maths is an on-going process across the college, with staff fully supported by the lead practitioner team, the outstanding practitioner team and academic mentors. The teaching and learning process identifies areas for improvement and good practice around the embedding of maths. Developmental reviews following observation show the impact of peer observations, individual support and training sessions on individual staff and identify where improvements have been made.

5.11 The area has worked hard to raise the profile of maths across college and for the first time last year celebrated World Maths Day with a large cross-college event in the Great Hall. The focus was on maths within vocational areas and over 400 students took part in a wide range of fun activities, such as 'Countdown', 'ratios/mocktails' and 'weighing luggage'. The college also took part in the national pilot of the maths enhancement programme in 2012/13 and again in 2013/14 when the programme was rolled out across the country. Its purpose is to bridge the gap between teaching functional and GCSE Maths. We hosted 6 days of regional training during the year and 8 college staff have been involved to date.

5.12 The college is fully committed to the STEM (science, technology, engineering and maths) agenda and has achieved 'STEM Assured' status. The higher level maths co-ordinator leads on the Level 3 core maths project which is part of the national pilot, with 20 students from across college (IT, engineering, accounts, business) participating.

STEM ASSURED

6 NEXT STEPS

6.1 For 2014/15, our priorities are to continue to improve success rates, to enhance the learning experience of students and to plan for the large growth of GCSE provision expected in September 2015.

6.2 Our greatest challenge is to ensure that the college is fully ready for all the students who will enrol directly on to GCSE maths in September 2015. Based on student numbers, the provision will be at least three times larger than it is currently, as those with weak initial and functionality assessments are at present working towards functional maths as a stepping stone towards GCSE.

6.3 For functional maths, we will continue to deliver customised training to vocational teams. The curriculum area is in the process of creating an induction pack for lecturers who are new to teaching functional maths. These staff are already assigned a 'buddy' to support them through their first year of delivery. The GCSE maths team is developing a wide range of on-line resources for use by staff and students and we have recently purchased the brand new bksbLIVE GCSE maths resource bank which allows the tracking of students' progress as they work through the materials.

6.4 We will continue to run training sessions on both delivering maths qualifications and also on how to embed maths into the vocational curriculum. Alongside the new teaching and learning observation process, we will conduct walk-throughs of all functional maths classes and use feedback on the embedding of maths to support staff individually and in curriculum teams as appropriate.

6.5 The college will continue to engage with the national maths enhancement programme and plan to involve a new cohort of staff from across college.

6.6 Nationally, there is already a shortage of good, well qualified maths teachers, so we are exploring new ways of recruiting suitable staff. The college plans to take advantage of funding which will enable recruitment of newly qualified maths graduates who will be trained in-house. In addition, we are looking to retrain some existing staff who want to move into this area of teaching. There is already an excellent teacher-training team in college and 8 staff across college have the maths specialist teaching qualification. The college is already working with Warwick University to deliver the maths enhancement programme and the Level 4 'Embedding Maths in a Vocational Curriculum' qualification, so is well-placed to develop a new team of delivery staff.

6.7 The curriculum leader for GCSE maths is developing a comprehensive in-year tracking system which will measure progress within grades, for example, D1 to D2. This way the college will be able to clearly see progress towards grade C and above.

If you are interested in learning more about Maths at Dudley College, or would like a copy of the English and Maths policy please contact:

Hilary Jakovlevs
Executive Director of Standards and Learning
The Broadway
Dudley
DY1 4AS
Email: hilary.jakovlevs@dudleycol.ac.uk
Tel: 01384 363494

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