

TransMaths Project Questionnaire

Mathematics learning, identity and educational practice: the transition into Higher Education

This is a research project being carried out by a team based in the School of Education at the University of Manchester that aims to understand how students who have chosen to study a range of courses are supported with their mathematics during transition into and during their first year of university. This links with a recent research project completed by the team which investigated students studying mathematics at college. For more information or a link to the online version please visit <http://www.lta.education.manchester.ac.uk/TLRP/>.

Your first choice university course may be one that the project will be investigating over the next two years, or you may have been involved before. At this early stage the team would be very pleased if you would take about 10 - 20 minutes to complete this questionnaire that will help us to understand students entering such courses (what we call 'transition' into university). All information that you give will be treated confidentially and will not be shared in such a way with anyone, including staff associated with your chosen course, in any way that will identify you.

At a later stage the project would like you to complete two further questionnaires during the forthcoming academic year (2008-9) and with your permission may get in touch to interview you in more detail. If you agree to take part in an interview, this will be conducted at a time and place convenient to you. Each interview will last about 30 minutes and will be recorded and transcribed.

After completing this questionnaire, please give it to a project team member or send it to the following free-post address:

Tim Millar, Humanities Building
University of Manchester
FREEPOST NAT 12243
MANCHESTER
M13 1ZG

So, welcome aboard and enjoy the journey!

Background Information

[* Questions marked with an asterix are required]

1. Surname:* _____
2. Forename(s):* _____
3. Gender:* ☐ Female ☐ Male
4. Date of Birth:* (dd/mm/yyyy) _____
5. Home Postcode (UK) or country if international: _____
6. UCAS application number (if known): _____
7. Have you been involved in completing questionnaires for the previous mathematics research project last year?* ☐ Yes ☐ No
8. First choice of university (e.g. on UCAS form):* [Please tick one]
 - ☐ The University of Manchester
 - ☐ Manchester Metropolitan University
 - ☐ Leeds University
 - ☐ Loughborough University
 - ☐ Queen Mary, University of London
 - ☐ Other
9. If you selected 'other', please tell us your university of first choice:

10. My first choice course/programme of study will be:* [Please tick one]
 - ☐ Electronic and Electrical Engineering
 - ☐ Polymer Technology & Materials Engineering
 - ☐ Physics
 - ☐ Medicine
 - ☐ Mathematics
 - ☐ Sociology
 - ☐ Other
11. If you selected 'other', please specify.

Permissions and informed consent

By completing this survey I give my consent for the project to:

- use the data I give for research purposes on the understanding that my input will be anonymised so that information I supply cannot be traced back to me
- get in touch with me in the future with the expectation that I will complete a further two questionnaires later on your course
- have access to data (such as in my application to university, my examination results, contact details) I have supplied to, or which is held by UCAS, HESA and/or other government databases.

I have read the project information sheet and understand that I may withdraw this consent at any time.

12. I am over 18.* ☐ Yes ☐ No

13. I agree to take part in this research.* ☐ Yes ☐ No

For future contact

14. **Contact details:**

Home phone number _____

Mobile phone number _____

Email address _____

15. I suggest you contact me on the following:

- ☐ Mobile phone
- ☐ Home phone
- ☐ Email
- ☐ Other, please specify _____

16. Will you be willing to take part in a (telephone) interview shortly?*

☐ Yes ☐ No

A. About your university choices

Within this section we want to understand why you have chosen this University and course as your first choice.

17. How much do you agree with the following statements about the importance of each of these factors for your choice? *[Please circle 1, 2, 3 or 4, or tick the box if you don't know]*

I have chosen my first choice university:*	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know
So I can live at home	1	2	3	4	
Because I think this university has a high reputation	1	2	3	4	
Because I believe the quality of my chosen course/ programme is high	1	2	3	4	
Because I think the quality of teaching will be good	1	2	3	4	
Because the social scene appeals to me	1	2	3	4	
So I can live away from home	1	2	3	4	
Because the university and/or course was personally recommended to me	1	2	3	4	
Because of financial considerations	1	2	3	4	
Because I think the quality of the university facilities/campus is good	1	2	3	4	

18. Please list any other important reasons for your university choice:
[continue on the last page if necessary]

19. How significant were the following factors for your subject choice?*

[Circle 1, 2, 3 or 4, or tick the box if you don't know]

	Not significant at all	Somewhat significant	Significant	Very significant	Don't Know
Career aspiration / ambition	1	2	3	4	
Childhood dream	1	2	3	4	
Being good at the subject	1	2	3	4	
Enjoyment / Interest in the subject	1	2	3	4	
The value of the degree for future earnings/salary	1	2	3	4	

20. Please comment, e.g. tell us any other significant reasons for your subject choice:
[continue on the last page if necessary]

For the next four questions, please tick whether you think the story applies for you and comment:

21. My idea about what I wanted to do at University didn't change during my pre-university course (e.g. IB, AS/A Levels, BTEC): basically I've have been getting on with it and managed to keep on course.

☐ True ☐ False

You may wish to comment on this here: **[continue on the last page if necessary]**

22. My original idea about what to do at university was threatened by various events (e.g. on arrival at 6th form College, personal troubles, exam results) but finally I am back on track because (e.g. I took resits/an extra year)...

☐ True ☐ False

You may wish to comment on this here: **[continue on the last page if necessary]**

23. Since starting my pre-university course (e.g. IB, AS/A Levels, BTEC), I changed my mind about what I wanted to do at university because (i) I discovered a new interest/enthusiasm/ career; (iii) my grades weren't what I expected/hoped for; (ii) of various personal and financial reasons (iv) for other reasons (please state).

☐ True ☐ False

You may wish to comment on this here: **[continue on the last page if necessary]**

24. When I started my pre-university course (e.g. IB, AS/A levels, BTEC) I really hadn't decided what to do at university but then something happened (a course, a teacher, family event ?) and that's why I chose what I'm doing now.

☐ True ☐ False

You may wish to comment on this here: **[continue on the last page if necessary]**

25. We want to know about experiences that helped you decide or influenced your choice of university and course.

Please state the degree of your agreement with the following statements:*

[Circle 1, 2, 3 or 4, or tick the box if you don't know]

	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know
My experience of open day/ visit was influential.	1	2	3	4	
My meetings with lecturers or teachers were influential.	1	2	3	4	
My experience of a special lecture or event held at my school/college was important.	1	2	3	4	
My experience of speaking with a friend/acquaintance who is at, or has been to, my intended university was influential.	1	2	3	4	
My reading of information on the university / subject I have chosen (e.g. from the internet, brochures) was very important.	1	2	3	4	
Teachers at my school/college have influenced my choice.	1	2	3	4	
Parents and family have influenced my choice.	1	2	3	4	

26. What other experiences or people have influenced your choice of university and subject/programme?

27. B. Expectations of University Experience

Within this section we want to know what you are expecting about how you will learn and be taught at the university.

28. What do you think the main differences will be in learning and teaching at university compared to your previous experience in School/College?

[continue on the last page if necessary]

29. How do you feel about these differences?

[continue on the last page if necessary]

30. How well do you think School/College prepared you for:*

[Circle 1, 2, 3 or 4, or tick the box if you don't know]

	Not well prepared	Somewhat prepared	Prepared	Well prepared	DON'T KNOW
Studying on your own from texts/notes	1	2	3	4	
Listening in lectures	1	2	3	4	
Taking notes in lectures	1	2	3	4	
Working on team projects	1	2	3	4	
Doing laboratory work	1	2	3	4	
Researching topics	1	2	3	4	
Computer-based learning	1	2	3	4	
Whole class teaching	1	2	3	4	
Working/discussing in small groups	1	2	3	4	

31. How important do you think this kind of study will be for your first year course?*

[Circle 1, 2, 3 or 4, or tick the box if you don't know]

	Not important at all	Somewhat Important	Important	Very important	DON'T KNOW
Studying on your own from texts/notes	1	2	3	4	
Listening in lectures	1	2	3	4	
Taking notes in lectures	1	2	3	4	
Working on team projects	1	2	3	4	
Doing laboratory work	1	2	3	4	
Researching topics	1	2	3	4	
Computer-based learning	1	2	3	4	
Whole class teaching	1	2	3	4	
Working/discussing in small groups	1	2	3	4	

32. Please tell us how many hours you spent in a normal teaching week on the following during your last year of school/college study and try to estimate how many hours you will spend on each at University (you may leave these blank):

	Hours at school/college	Hours at University
Study on your own		
Being taught on a one-to-one basis		
Being taught in a small group (5 students or fewer)		
Being taught in a classroom/seminar (between 6 and 15 students)		
Being taught in a large class/group (between 16 and 50 students)		
Being taught in a large lecture group (more than 50 students)		
Do laboratory work		
Engage with other type of study		

Total weekly work time:		
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C. Mathematics Experience and Expectations

33. How often did you do the following in your last year of mathematics lessons (IB, GCSE, AS or A2 level or other)? [Please tick as appropriate: ☐ GCSE, ☐ AS, ☐ A2, ☐ IB, ☐ other]

[Circle 1, 2, 3 or 4, or tick the box if you don't know]

	Almost never	Some of the time	Most of the time	Almost always	DON'T KNOW
1. We (students) were using only the methods the teacher had taught us.	1	2	3	4	
2. We were choosing which questions to tackle.	1	2	3	4	
3. We were comparing different methods for doing questions.	1	2	3	4	
4. The teacher was drawing links between topics and moved back and forth between topics.	1	2	3	4	
5. We were working collaboratively in small groups.	1	2	3	4	
6. We (students) were discussing our ideas.	1	2	3	4	
7. We were working collaboratively in pairs.	1	2	3	4	
8. We were inventing our own methods.	1	2	3	4	
9. The teacher was telling us which questions to tackle.	1	2	3	4	
10. The teacher was encouraging us to work more quickly.	1	2	3	4	
11. The teacher was teaching each topic separately.	1	2	3	4	

34. My preferred options for any future study will include:*

- ☐ a lot of mathematics
- ☐ quite a lot of mathematics
- ☐ a moderate amount of mathematics
- ☐ as little mathematics as possible
- ☐ no mathematics
- ☐ DON'T KNOW

35. The mathematics in my future study will be:*

- ☐ essential
- ☐ very important
- ☐ quite important
- ☐ not at all important
- ☐ DON'T KNOW

36. If I find out that any future study involves more mathematics than I thought, this would make me feel:*

- ☐ very happy
- ☐ fairly happy
- ☐ not bothered one way or the other
- ☐ fairly unhappy
- ☐ very unhappy
- ☐ DON'T KNOW

37. If in the future I am studying a course involving mathematics, then I would prefer it to be:*

- ☐ familiar mathematics that I have already done
- ☐ new mathematics that I have not learnt before
- ☐ a mix of familiar and new mathematics
- ☐ DON'T KNOW

38. If you have a particular career in mind at this stage, please choose:*

- ☐ Engineering
- ☐ Medicine
- ☐ Teaching
- ☐ Other
- ☐ I don't have a career in mind at the moment

If you selected "other", or need to specify, please do it here:

39. How important do you think mathematics will be for this career?

- ☐ Not important at all
- ☐ Somewhat important
- ☐ Important
- ☐ Very important
- ☐ DON'T KNOW

D. Completing the course

We also want to know how you feel about completing your chosen degree subject.

40. Please rate your agreement with the following statements:*

[Circle 1, 2, 3 or 4, or tick the box if you don't know]

	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know
I might be prepared to change my course/subject or degree Programme	1	2	3	4	
I would take a job rather than complete my course if a good job was on offer	1	2	3	4	
I might consider taking time off or interrupting my degree course for a while	1	2	3	4	
I am quite certain I will complete my degree course	1	2	3	4	

E. Using Mathematics [Part A]

41. What Mathematics do you think will be useful for your university course?*

[Circle 1, 2, or 3, or tick the box if you don't know]

	Not useful at all	Somewhat useful	Useful	DON'T KNOW
Calculating/estimating	1	2	3	
Using ratio and proportion	1	2	3	
Manipulating algebraic expressions	1	2	3	
Proofs/ proving	1	2	3	
Problem solving	1	2	3	
Modelling real situations	1	2	3	
Using basic calculus (differentiation/integration)	1	2	3	
Using complex calculus (differential equations/multiple integrals)	1	2	3	
Using statistics	1	2	3	
Using complex numbers	1	2	3	

42. How confident are you with this maths?*

[Circle 1, 2, 3 or 4, or tick the box if you don't know]

	Not confident at all	Somewhat confident	Confident	Very Confident	DON'T KNOW
Calculating/estimating	1	2	3	4	
Using ratio and proportion	1	2	3	4	
Manipulating algebraic expressions	1	2	3	4	
Proofs/ proving	1	2	3	4	
Problem solving	1	2	3	4	
Modelling real situations	1	2	3	4	
Using basic calculus (differentiation/integration)	1	2	3	4	
Using complex calculus (differential equations/multiple integrals)	1	2	3	4	
Using statistics	1	2	3	4	
Using complex numbers	1	2	3	4	

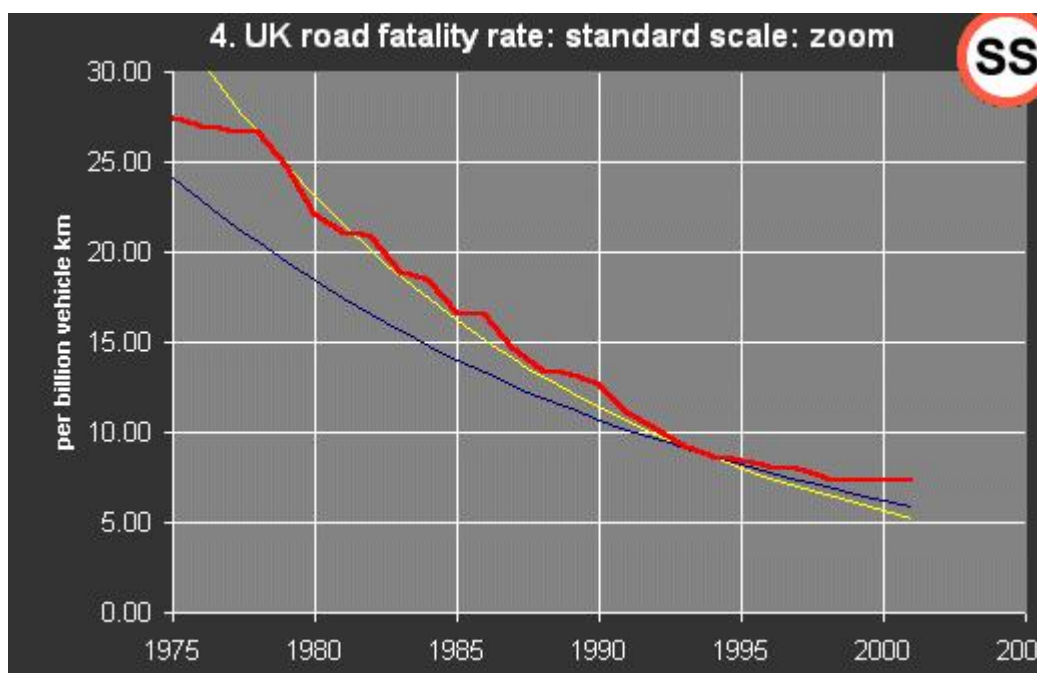
E. Using Mathematics [Part B]

In this section you are asked to say how confident you would be at using mathematics to solve different problems. **You are not asked to actually solve the problems.**

Imagine that you have been given the following maths questions to do, perhaps for homework. You would be able to use your notes, textbook(s), calculator, and so on when necessary. You are asked to rate how confident you are that you would be able to solve each problem, **without actually doing the problem.**

How confident are you that you are able to solve problems of the kind given in each case? [Please tick one of the four boxes as appropriate]

43. Modelling real situations:



Use a logarithmic transformation of data taken from the graph to find an exponential function that models how road fatalities are falling with time.

- ☐ Not confident at all
- ☐ Not very confident
- ☐ Fairly confident
- ☐ Very confident

How confident are you that you are able to solve problems of the kind given in each case? [Please tick one of the four boxes as appropriate]

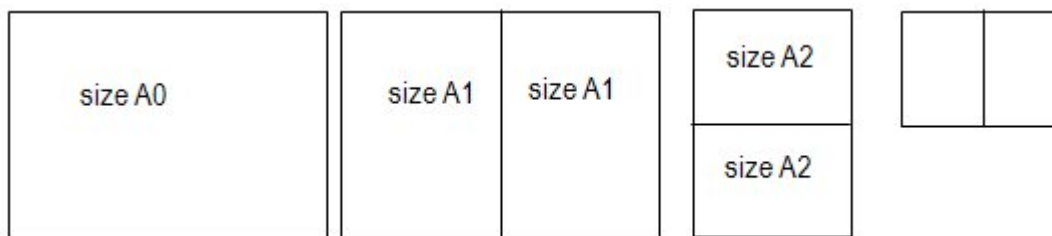
Please do not try to answer the problem, but estimate how confident you feel that you could answer the problem in time.

44. Calculating/estimating:

A loan for £50,000 is charged interest at 0.00667% per month. You pay £400 per month. After how long will the amount remaining to be paid be half of the original loan, i.e. £25,000.

- ☐ Not confident at all
- ☐ Not very confident
- ☐ Fairly confident
- ☐ Very confident

45. Using ratio and proportion:



The A0, A1, A2, A3, A4 series of paper sizes is such that the ratio of length to width of each sheet is always $\sqrt{2} : 1$.

The A0 paper has an area of 1 square metre.

Size A1 is formed by aligning two sheets so that the sum of their widths is the length of size A0.

Size A2 is formed by aligning two sheets so that the sum of their widths is the length of size A1, and so on.

Calculate the dimensions of a piece of A4 paper, correct to the nearest millimetre.

- ☐ Not confident at all
- ☐ Not very confident
- ☐ Fairly confident
- ☐ Very confident

How confident are you that you are able to solve problems of the kind given in each case? [Please tick one of the four boxes as appropriate]

Please do not try to answer the problem, but estimate how confident you feel that you could answer the problem in time.

46. Solving problems using algebra:

Find the **two** points of intersection of the straight line, $y + x = 5$, with the parabola, $y = x^2 - 2x + 1$.

- ☐ Not confident at all
☐ Not very confident
☐ Fairly confident
☐ Very confident

47. Proofs/proving:

Prove that the product of the roots of the quadratic equation $ax^2 + bx + c = 0$ is given by c/a

- ☐ Not confident at all
☐ Not very confident
☐ Fairly confident
☐ Very confident

48. Problem solving:

The table below shows how the circumference of a glass varies with height.

Find, using mathematics, the height to which you would need to fill the glass so that you have half a glass of



beer.

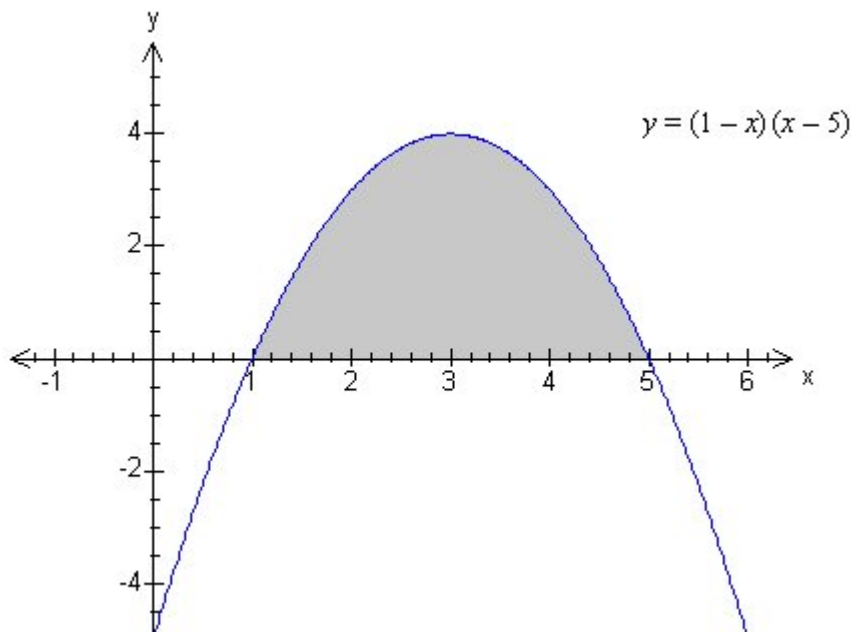
Height (cm)	Circumference (cm)
0.0	0.0
0.3	8.7
1.0	16.6
2.0	22.6
3.0	26.4
4.0	29.8
5.0	32.0
6.0	33.3
7.0	32.0
8.0	30.0
8.7	27.3

- ☐ Not confident at all
☐ Not very confident
☐ Fairly confident
☐ Very confident

How confident are you that you are able to solve problems of the kind given in each case? [Please tick one of the four boxes as appropriate]

Please do not try to answer the problem, but estimate how confident you feel that you could answer the problem in time.

49. Using calculus (differentiation/integration):



Calculate the shaded area.

- ☐ Not confident at all
- ☐ Not very confident
- ☐ Fairly confident
- ☐ Very confident

50. Using advanced calculus (e.g. differential equations/multiple integrals):

A bottle of orange juice is taken out of a fridge at 2°C and placed in a room at a temperature of 20°C .

Find an expression for the temperature, $T^{\circ}\text{C}$, of the bottle of orange juice, t minutes after it is taken out of a fridge that is maintained at a temperature $T = 2$ given that it warms up according to the differential equation, $dT/dt = (20 - T)/40$

- ☐ Not confident at all
- ☐ Not very confident
- ☐ Fairly confident
- ☐ Very confident

How confident are you that you are able to solve problems of the kind given in each case? [Please tick one of the four boxes as appropriate]

Please do not try to answer the problem, but estimate how confident you feel that you could answer the problem in time.

51. Using statistics:

The tables below show how a school's pupils perform in tests compared with schools containing pupils who performed at a similar level in previous tests.

Percentage of pupils reaching level 5 or above

Percentile	95th	Upper quartile	60th	40th	Lower quartile		5th	
English (tests)	83	75	70	64	60	59	47	
Mathematics (tests)	80	73	70	66		62	62	55
Science (tests)	81	74	70	66		62	58	52

Percentage of pupils reaching level 5 or above

Percentile	95th	Upper quartile	60th	40th	Lower quartile	5th	
English (tests)	49	36	31	25	21	20	12
Mathematics (tests)	56	48	45	41	39	37	30
Science (tests)	45	36	32	28	28	24	16

The school's percentages performing at level 5 or above and level 6 or above in English, Mathematics and Science are shown in bold. For example, 60% of the school's pupils achieved level 5 or above in English and this was below the 40th percentile and above the lower quartile for similar schools.

Interpret how this school's pupils performed in each subject and across subjects.

- ☐ Not confident at all
☐ Not very confident
☐ Fairly confident
☐ Very confident

52. Working with complex numbers:

Given that $x = 1$ is a root of $y = x^3 + x^2 + 2x - 4$ find the two remaining complex roots.

- ☐ Not confident at all
☐ Not very confident
☐ Fairly confident
☐ Very confident

THANK YOU VERY MUCH FOR YOUR TIME – HAVE A NICE SUMMER AND GOOD LUCK!

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