

Module Narrative

1.	Module title:	Mathematical Understanding and Teaching Initiatives - Underpinning Theory
2.	Module code:	DAPP22-01
3	Credits:	30
4	FHEQ level:	7
5.	Start semester:	Real Group does not have a semester-based academic year. Modules have multiple start dates per year.
6.	Module leader:	Dr Catherine Marshall
7.	Accredited by:	
8.	Module restrictions:	
	Pre-requisite requirements	None
	Programme restrictions	None
	Level restrictions	None
	Other restrictions or requirements	GCSE Maths Grade C/4 or equivalent

9. Module aims

To critically examine the research on the acquisition of mathematical understanding, considering both its applications and limitations. To explore a wide range of factors that affect mathematical cognition and development. To provide the opportunity to critically reflect upon the merits of a range of teaching initiatives and resources.

10. Learning outcomes**Knowledge and Skills**

On successful completion of this module, the student will be able to:

1. Critically examine the influence of a range of factors on the acquisition of numeracy and other types of mathematical skills.
2. Critically appraise a range of curricular and teaching practice initiatives associated with the development of mathematical understanding.
3. Critically evaluate a range of maths resources with reference to the cognitive and affective processes that contribute to mathematical understanding.

11. Syllabus

- The characteristics of a good mathematician - the core skills, habits of mind and how these contribute to mathematical competence.
- Typical and atypical development of maths skills - factors affecting development.
- Approaches to teaching maths and conceptualising mathematical understanding (e.g., relational versus instrumental understanding)
- Evaluating maths teaching methods and initiatives that can boost mathematical understanding
- Cognitive processes involved in mathematical reasoning/understanding
- Numeracy versus mathematical understanding
- Appraising resources – what makes a resource effective?
- Affective issues in maths learning (maths anxiety)
- AI literacy and ethics for specialist teachers

12. Learning and teaching

12a. Learning and teaching strategy

Learning and teaching will be via distance education using Real Group's online Virtual Learning Environment, Campus Online.

Students access the study topics, including the learning activity instructions and supporting content through Campus Online.

Campus Online is an integrated environment that:

- Guides the student through the module, giving guidance about the completion of the module's series of learning experiences. These experiences are designed to cover the Learning Outcomes so that the student can pass their assessments.
- Allows students to manage and track their progress through the activities and assessments.
- Allows the flexibility for students to work at their own pace, around their individual schedule and to revisit all materials at any point in their studies.
- Enables students to submit their evidence and assignments, and receive feedback from their tutors.

These are supported by activities that promote review and reflection and provide access to relevant theory, policy, case study and exercises. There is access to supporting content including:

- Directed reading of selected papers, book chapters, specialist online materials.
- Use of case study examples, videos and other learning materials.
- Practical activities and reflection on own practice, structured through 'learning log' online entries.

Campus Online also supports a collaborative learning environment with:

- Fellow students via online discussions to problem-solve issues raised by delegates from real-life settings, to critically analyse ideas and research, and respond to practical case studies.
- Interaction with tutors including receiving formative feedback, and more general support (for learning, technical questions and course administration) via private messaging and forums.
- Both students and tutors via webinars (both live and recorded) by tutors and visiting professionals and academics.

12b. Delivery method	
Distance Education	
12c. Learning and teaching hours¹	
The number of timetabled hours for learning and teaching activity, including on-campus and online. For Higher Degree and Apprenticeship programmes, this is University-led Off the Job hours.	0
The number of hours a student should complete independent study. For Higher Degree and Apprenticeship programmes, this is Apprentice-led Off the Job hours.	300
The number of hours on placement (including placement, work-based learning or year abroad). For Higher Degree and Apprenticeship programmes, this is Employer-led Off the Job hours.	0
13. Assessment	
13a. Assessment scheme	

¹ Completing this is a regulatory requirement, used as part of our submission to Discover Uni (previously UniStats).

Formative:

Could include:

- Quizzes: comprehensive quizzes covering key content for practice - automatic feedback via VLE.
- Case study plan uploaded for tutor review

Summative:

Case study: (For example) - Development of mathematical skills with reference to theories and research

Weighting	Specification e.g. word count, duration, page numbers	LO mapped to	Anonymously marked	Submission point	Ethics approval required
60	3000 words	1	Yes	End-module	No

Presentation/blog: (For example- Poster, with explanatory notes exploring a range of maths teaching approaches with reference to underpinning theory and research)

Weighting	Specification e.g. word count, duration, page numbers	LO mapped to	Anonymously marked	Submission point	Ethics approval required
20	6 - 8 minutes reading time	2	Yes	End-module	No

Presentation/blog: (For example) Consisting of a critical evaluation of effectiveness of maths resources in the support of the cognitive and affective challenges maths learners can encounter - with reference to underpinning theory and research

Weighting	Specification e.g. word count, duration, page numbers	LO mapped to	Anonymously marked	Submission point	Ethics approval required
20	5 - 6 minutes reading time	3	Yes	End-module	No

13b. Module pass mark/progression requirement:

In order to pass the module, the student will be required to achieve:

- an overall aggregate of 50% (grade 16) with a minimum of 50% (grade 16) in each assessment component.

13c. Overview of assessment²

COURSEWORK		100%
EXAM ³		0%
PRACTICAL		0%
If exam selected	What % of the exam is seen/unseen:	Seen.....%
		Unseen%

² This information will be used as part of our submission to Discover Uni (previously Unistats). See LQEH Section 16b for definitions of assessment methods.

³ Where exams are required by a PSRB for in-house, franchise and joint programmes.

	Will this require separate timetabling arrangements?	Yes ☐ No ☐
	Length of exam	hours

14. Learning materials

Essential

- All essential reading materials that are required for the course are available to students, embedded within Campus Online. This may be as a journal article or extract from a key text, etc.
- Gilmore, C., Göbel, S. M., & Inglis, M. (2018). *An introduction to mathematical cognition*. Routledge.

Recommended

- Fias, W. & Henik, A. (2021). *Learning and Education in Mathematical Cognition*. Academic Press
- Chinn, S., & Ashcroft, R. E. (2017). *Mathematics for dyslexics and dyscalculics: a teaching handbook*. John Wiley & Sons.
- Chinn, S. (Ed.). (2017). *The Routledge international handbook of dyscalculia and mathematical learning difficulties*. Routledge.
- Kersaint, G., Thompson, D.R. and Petkova, M. (2013) Teaching Mathematics to English Language Learners, 2nd edn. New York: Routledge.
- Battey, D., & Franke, M. (2015). Integrating professional development on mathematics and equity: Countering deficit views of students of color. *Education and Urban Society*, 47(4), 433-462.
- Mammarella, I. C., Caviola, S., & Dowker, A. (Eds.). (2019). *Mathematics anxiety: What is known, and what is still missing*. Routledge.

15. Timetabling information (HENDON only)

	Required	Hours per week	Group size
Large class (two groups merged)	Yes/No		
Seminar (SEM)	Yes/No		
Laboratory (LAB)	Yes/No		
Workshop (WRK)	Yes/No		
Online session (OL)	Yes/No		
Other (please specify)	Yes/No		

16. Module run (in-house, franchised and joint only)

Academic year	Semester	Start date	End date	Max student numbers	Campus	Franchise partner

17. Programme(s) using this module (where a new module is being added to a programme outside of a validation and review event, please also submit a Programme Change Form and tracked change Programme specification):		
Programme code(s)	Programme title(s)	Core/Elective
600X178	MEd Professional Practice in Maths-Related Difficulties (DL)	Core
600X176	PGDip Specialist Assessment and Teaching for Maths-Related Difficulties(DL)	Core
600X174	PGCert Specialist Teaching for Maths-Related Difficulties (DL)	Core
600X194 / 600X195 / 600X196	MEd SEND and Inclusion / PgDip SEND and Inclusion / PgCert SEND and Inclusion	Elective
600X180 / 600X182	MEd SEND and Inclusion: Autism / PgDip SEND and Inclusion: Autism	Elective
600X183 / 600X185	MEd SEND and Inclusion: Pastoral / PgDip SEND and Inclusion: Pastoral	Elective
600X186 / 600X188	MEd SEND and Inclusion: Assessment / PgDip SEND and Inclusion: Assessment	Elective
600X189 / 600X191	MEd Inclusive Educational Leadership / PgDip Inclusive Educational Leadership	Elective

18. Validated collaborative partner (if applicable):
Real Group Ltd., trading as Dyslexia Action Training