

TABLE OF CONTENTS

PREFACE	v
SECTION 1	INTRODUCTION
	1
CLAUDI ALSINA	
Why the Professor Must be a Stimulating Teacher: Towards a New Paradigm of Teaching Mathematics at University Level	3
ROBYN ZEVENBERGEN	
Changing Contexts in Tertiary Mathematics: Implications for Diversity and Equity	13
JAN THOMAS	
Policy Issues	27
POLICY CASE STUDIES	
JEAN-LUC DORIER & VIVIANE DURAND-GUERRIER	
Policy Issues Concerning Teaching at University Level In France	37
XIANG LONGWAN	
Mathematics Education In Chinese Universities	45
ANDERS TENGSTRAND	
Policy In Sweden	49
SECTION 2	PRACTICE
	57
JOEL HILLEL	
Trends in Curriculum: A Working Group Report	59
JOHN MASON	
Mathematical Teaching Practices At Tertiary level: Working Group Report	71
LEIGH WOOD	
The Secondary-Tertiary Interface	87
LARA ALCOCK & ADRIAN SIMPSON	
The Warwick Analysis Project: Practice and Theory	99
HARVEY KEYNES & ANDREA OLSON	
Professional Development for Changing Undergraduate Mathematics Instruction	113
MARC LEGRAND	
Scientific Debate In Mathematics Courses	127
KEN MILLETT	
Making Large Lectures Effective: An Effort to Increase Student Success	137

MOGENS NISS		
University Mathematics Based on Problem-Oriented Student Projects: 25 Years of Experience with the Roskilde Model		153
DAVID SMITH		
The Active/Interactive Classroom		167
DEPARTMENTAL PROFILES		
JOEL HILLEL		
Concordia University, Montreal, Canada		179
URS KIRCHGRABER		
Eidgenössische Technische Hochschule, Zurich, Switzerland		185
NESTOR AGUILERA & ROBERTO MARCIAS		
Universidad Nacional Del Litoral, Santa Fe, Argentina		191
Universiti Teknologi Malaysia, Malaysia		195
MARTTI PESONEN		
University of Joensuu, Finland		199
SECTION 3	RESEARCH	205
MICHÉLE ARTIGUE		
What Can We Learn from Educational Research at the University Level?		207
ALAN SCHOENFELD		
Purposes and Methods of Research in Mathematics Education		221
ANNIE SELDEN & JOHN SELDEN		
Tertiary Mathematics Education Research and Its Future		237
JEAN-LUC DORIER & ANNA SIERPINSKA		
Research into the Teaching and Learning of Linear Algebra		255
ED DUBINSKY & MICHAEL MCDONALD		
APOS: A Constructivist Theory of Learning In Undergraduate Mathematics Education Research		275
ALINE ROBERT & NATASHA SPEER		
Research on the Teaching and Learning of Calculus/Elementary Analysis		283
SECTION 4	MATHEMATICS AND OTHER DISCIPLINES	301
LYNN STEEN		
Revolution by Stealth: Redefining University Mathematics		303
JEAN-PIERRE BOURGUIGNON		
Mathematics And Other Subjects		313

BURKHARD KÜMMERER	
Trying the Impossible: Teaching Mathematics To Physicists And Engineers	321
JOHNNY OTTESEN	
Do Not Ask What Mathematics Can do for Modelling. Ask What Modelling Can do for Mathematics!	335
SECTION 5	TECHNOLOGY
	347
KAREN KING, JOEL HILLEL & MICHÈLE ARTIGUE	
Technology: A Working Group Report	349
JOAN GARFIELD, BETH CHANCE & J. LAURIE SNELL	
Technology in College Statistics Courses	357
JOEL HILLEL	
Computer Algebra Systems in the Learning and Teaching of Linear Algebra: Some Examples	371
ERIC MULLER	
Reflections on the Sustained Use of Technology in Undergraduate Mathematics Education	381
PHILLIP KENT & RICHARD NOSS	
Finding a Role for Technology in Service Mathematics for Engineers and Scientists	395
SECTION 6	ASSESSMENT
	405
KEN HOUSTON	
Assessing Undergraduate Mathematics Students	407
JIM RIDGWAY, MALCOLM SWAN & HUGH BURKHARDT	
Assessing Mathematical Thinking Via FLAG	423
CHRIS HAINES & KEN HOUSTON	
Assessing Student Project Work	431
SECTION 7	TEACHER EDUCATION
	443
HONOR WILLIAMS	
Preparation of Primary and Secondary Mathematics Teachers: A Working Group Report	445
THOMAS COONEY	
Using Research to Inform Pre-Service Teacher Education Programmes	455

CATHY KESSEL & LIPING MA Mathematicians and the Preparation of Elementary Teachers	467
MICHEL HENRY & BERNARD CORNU Mathematics Teachers' Education in France: From Academic Training to Professionalization	481
BERNARD HODGSON The Mathematical Education of School Teachers: Role and Responsibilities of University Mathematicians	501
MARC LEGRAND On The Training of French Prospective University Teachers	519
JOHN MASON Professionalisation of Teaching in Higher Education in the United Kingdom	529
ERIC WITTMANN The Alpha and Omega of Teacher Education: Organizing Mathematical Activities	539
INDEX	553



<http://www.springer.com/978-0-7923-7191-5>

The Teaching and Learning of Mathematics at
University Level

An ICMI Study

Holton, D. (Ed.)

2001, VIII, 562 p., Hardcover

ISBN: 978-0-7923-7191-5