Proceedings of the 13th International Conference on Technology in Mathematics Teaching

ICTMT 13

École Normale Supérieure de Lyon / Université Claude Bernard Lyon 1

3 to 6 July, 2017

Gilles Aldon, Jana Trgalová







Table of contents

1	Introduction	9
2	CURRICULUM	13
	THE IMPACT OF TECHNOLOGY USE ON THE CURRICULUM OF THE COURSE "PLAN TRANSFORMATIONS IN GEOMETRY": A SELF-STUD vich Irina [et al.]	Y, Gure- 13
	COMPUTER SCIENCE IN MATHEMATICS' NEW CURRICULA AT PRI- MARY SCHOOL: NEW TOOLS, NEW TEACHING PRACTICES?, Haspekia Mariam	an 23
	${\bf INTERACTIVE\ DIAGRAMS\ USED\ FOR\ COLLABORATIVE\ LEARNING,}$ taliev Elena	Naf- 32
	COMPETENCIES AND DIGITAL TECHNOLOGIES – REFLECTIONS ON A COMPLEX RELATIONSHIP, Weigand Hans-Georg	40
	BLENDING COMPUTATIONAL AND MATHEMATICAL THINKING IN PRIMARY EDUCATION: THE SCRATCHMATHS PROJECT IN ENGLAND, Clark-Wilson Alison [et al.]	48
3	ASSESSMENT	51
	A, B or C? THE ROLE OF POLES IN PROMOTING FORMATIVE ASSESSMENT IN A CONNECTED CLASSROOM ENVIRONMENT, Cusi Annalisa [et al.]	51

25 YEARS OF E-AsSESSMENT AND BEYOND: HOW DID I DO!, McCabe Michael	61
MAKING GOOD PRACTICE COMMON PRACTICE BY USING COMPUTER AIDED FORMATIVE ASSESSMENT, Olsher Shai [et al.]	- 69
CAN I SKETCH A GRAPH BASED ON A GIVEN SITUATION?—DEVELO A DIGITAL TOOL FOR FORMATIVE SELF-ASSESSMENT, Ruchniewicz Hana	
STUDENTS	87
STUDENTS' EXPANDING OF THE PYTHEGOREAN THEOREM IN A TECHNOLOGICAL CONTEXT, Anabousy Ahlam [et al.]	87
LOOKING AT COMPOSITIONS OF REFLECTIONS IN A DGE FROM THINKING MODES AND SEMIOTIC PERSPECTIVES, Donevska-Todoro Ana [et al.]	
GAMIFYING MATH TRAILS WITH THE MATHCITYMAP APP: IMPACT OF POINTS AND LEADERBOARD ON INTRINSIC MOTIVATION janow Iwan [et al.]	
"POWER OF SPEED" OR "DISCOVERY OF SLOWNESS": TECHNOLOG ASSISTE GUIDED DISCOVERY TO INVESTIGATE THE ROLE OF PARAMETERS IN QUADRATIC FUNCTIONS, Göbel Lisa [et al.]	
DYNAMIC GEOMETRY SOFTWARE IN MATHEMATICAL MODELLING ABOUT THE ROLE OF PROGRAMME-RELATED SELF-EFFICACY ANI ATTITUDES TOWARDS LEARNING WITH THE SOFTWARE, Hertlei Corinna)
FEEDBACK IN A COMPUTER-BASED LEARNING ENVIRONMENT AE QUADRATIC FUNCTIONS: RESEARCH DESIGN AND PILOT STUDY, J Elena	

4

EXPLOITING POTENTIALS OF DYNAMIC REPRESENTATIONS OF

144

FUNCTIONS WITH PARALLEL AXES, Lisarelli Giulia

REASONING STRATEGIES FOR CONJECTURE ELABORATION IN DOI Iman [et al.]	GE, Osta 151
ALGEBRA STRUCTURE SENSE IN A WEB ENVIRONMENT: DESIG AND TESTING OF THE EXPRESSION MACHINE, Rojano Teresa44	N 159
CENTRAL AND PARALLEL PROJECTIONS OF REGULAR SURFACE GEOMETRIC CONSTRUCTIONS USING 3D MODELING SOFTWARE, Petra	
SPATIAL—SEMIOTIC ANALYSIS OF AN EIGTH GRADE STUDENT USE OF 3D MODELLING SOFTWARE, Uygan Candas [et al.]	'S 177
MATHEMATICS IN PRE-SERVICE TEACHER EDUCATION AND TH QUALITY OF LEARNING: an experience with paper planes, smartphonand geogebra, Luís Santos Fernando [et al.]	
THERE IS MORE THAN ONE FLIPPED CLASSROOM, Andrà Chiara [al.]	et 190
TEACHER	199
MOOC FOR MATHEMATICS TEACHER TRAINING: DESIGN PRINCE PLES AND ASSESSMENT, Aldon Gilles [et al.]	I- 199
THE EFFECT OF COLLABORATIVE COMPUTERIZED LEARNING USING GEOGEBRA ON THE DEVELOPMENT OF CONCEPT IMAGES OF THE ANGLE AMONG SEVENTH GRADERS, Baya'a Nimer	_
TEACHING WITH GEOGEBRA: RESOURCE SYSTEMS OF MATHEMATICS TEACHERS, Bozkurt Gulay [et al.]	E- 216
PLANNING TO TEACH LOWER SECONDARY MATHEMATICS WIT DYNAMIC MATHEMATICAL TECHNOLOGY: QUALITY FEATURES O	OF
LESSON PLANS, Clark-Wilson Alison [et al.]	224

PRE-SERVICE TEACHERS' PREPARATION AS A CATALYST FOR THE ACCEPTANCE OF DIGITAL TOOLS FOR TEACHING MATHEMATICS AND SCIENCE, Daher Wajeeh [et al.]

EFFECT OF GEOGEBRA COLLABORATIVE AND ITERATIVE PRO-	-
FESSIONAL DEVELOPMENT ON IN-SERVICE SECONDARY MATHE	-
MATICS TEACHERS' TPACK, Kasti Houssam	241

GEOGEBRA AND NUMERICAL REPRESENTATIONS: A PROPOSAL INVOLVING FUNDAMENTAL THEOREM OF ARITHMETIC, Oliveira Gerson 248

ANALYSING THE TEACHER'S KNOWLEDGE FOR TEACHING MATH-EMATICS WITH TECHNOLOGY, Rocha Helena 256

A CASE STUDY OF A SECONDARY SCHOOL MATHEMATICS TEACHER'S CLASSROOM PRACTICE WITH WEB-BASED DYNAMIC MATHEMATICAL SOFTWARE, Simsek Ali 266

A CLASSIFICATION OF RESOURCES USED BY MATHEMATICS TEACH-ERS IN AN ENGLISH HIGH SCHOOL, Umameh Michael [et al.] 276

DOCUMENTATION EXPERTISE AND ITS DEVELOPMENT WITH DOC-UMENTATIONAL EXPERIENCE IN COLLECTIVES: A FRENCH CASE OF COLLECTIVE LESSON PEPRATION ON ALGORITHMIC, De Morales Rocha Katiane [et al.] 285

IN SEARCH FOR STANDARDS: TEACHING MATHEMATICS IN TECH-NOLOGICAL ENVIRONMENT, Tabach Michal [et al.] 293

MATHMAGIC: the ENCOUNTER BETWEEN COMPUTATIONAL AND MATHEMATICAL THINKING, Lealdino Pedro [et al.] 301

MOVING, COMPARING, TRANSFORMING GRAPHS: A BODILY AP-PROACH TO FUNCTIONS, Ferrara Francesca [et al.] 304

DYNAMIC TECHNOLOGY FOR SIMULATING A SCIENTIFIC INQUIRY FOR LEARNING - TEACHING PRE-CALCULUS CONCEPTS, Swidan Osama [et al.]

6 INNOVATION 313

THE TRANSPOSITION OF COUNTING SITUATIONS IN A VIRTUAL

HANDWAVER: A GESTURE-BASED VIRTUAL MATHEMATICAL MAK-ING ENVIRONMENT, Dimmel Justin [et al.] 323

MONITORING A TECHNOLOGICAL BASED APPROACH IN MATHE-MATICS IN PORTUGAL - THE CASE OF KHAN ACADEMY, Domingos António 331

THE DESIGN AND USE OF OPEN ONLINE MODULES FOR BLENDED LEARNING IN STEM TEACHER EDUCATION, Drijvers Paul [et al.] 339

TEACHING LOCUS AT UNDERGRADUATE LEVEL: A CREATIVITY APPROACH, El-Demerdash Mohamed [et al.] 347

MATHEMATICS FOR GRAPHICS COMPUTING: students learn Algebra and program Python to create a project where they make Algebra create a scenario's photo., Gaspar Martins Sandra [et al.]

7 SOFTWARE AND APPLICATIONS

367

AN INTERACTIVE BOOK ON AXIAL SYMMETRY AND THE SYNER-GIC USE WITH PAPER AND PIN, Faggiano Eleonora [et al.] 367

STUDENTS' COVARIATIONAL REASONING: A CASE STUDY USING FUNCTION STUDIUM SOFTWARE, Gitirana Verônica 378

CATO-ANDROID: THE GUIDED USER INTERFACE FOR CAS ON ANDROID SMARTPHONES, Janetzko Hans-Dieter 386

WIMS WWW INTERACTIVE MULTIPURPOSE SERVER AN INTERACTIVE EXERCISE SOFTWARETHAT HAS 20 YEARS AND STILL IS AT THE TOP, Kobylanski Magdalena 392

GEOGEBRA AUTOMATED REASONING TOOLS: A TUTORIAL WITH TOOLS: A TUTORIAL WITH EXAMPLES, Kovacs Zoltan [et al.] 400

FUNCTION HERO: AN EDUCATIONAL GAME TO AFFORD CREATIVE

MATHEMATICAL THINKING, Lealdino Peda	M/	ATHEMAT	CICAL	THINKING.	Lealdino	Pedr
--------------------------------------	----	---------	-------	-----------	----------	------

4	\mathbf{n}	

457

	(UN)INTENDED REPRESENTATION IN DYNAMIC GEOMETRY SOFT WARE: PEDAGOGICAL CONSIDERATIONS, Okumus Samet	T- 412
	INCORPORATING LyX AS STANDARD TOOL FOR WRITING MATHEMATICS - EFECTS ON TEACHING AND LEARNING, Weiss Ittay	[- 419
	PRACTICING WIMS : HANDS-ON TRAINING, Buskulic Damir	427
8	POSTERS	431
	AUGMENTED LOG: USING AR TECHNOLOGY TO CONSTRUCT LEADING ABOUT LOGARITHMS AND EXPONENTIALS, Bini Giulia	RN- 431
	STRUCTURING HINTS AND HEURISTICS IN INTELLIGENT TUTOR ING SYSTEMS, Bos Rogier	R- 436
	TECHNOLOGY AS A RESOURCE TO PROMOTE INTERDISCIPLINAR ITY IN PRIMARY SCHOOLS, Domingos António	R- 440
	DESIGNING TASKS THAT FOSTER MATHEMALLY BASED EXPLANATIONS IN A DYNAMIC SOFTWARE ENVIRONMENT, Fahlgren Maria [6 al.]	
	BOUNDARY OBJECTS IN INTERDISCIPLINARY RESEARCH ON MUI TIMODAL ALGEBRA LEARNING, Janßen Thomas [et al.]	447
	LEARNING WITH INTERACTIVE VIRTUAL MATHS IN THE CLASS ROOM, Palha Sonia [et al.]	8- 449
	DIGITAL MATHEMATICS TEXTBOOKS: ANALYZING STRUCTURE A STUDENTS USES, Pohl Maximilian [et al.]	ND 453
	BRINGING APPROPRIATE MENTAL IMAGES TO THE FOREGROUN	D

USING DYNAMIC GEOMETRY AS A SEMIOTIC MEDIATOR: WHEN

IS A RECTANGLE A RECTANGLE?, Rizzo Ottavio

	THE USE OF COMPUTER BASED ASSESSMENT PISA 2012 ITEMS II MATHEMATICS CLASS: STUDENTS' ACTIVITIES AND TEACHERS PRACTICES, Salles Franck [et al.]	- '
	THE GRAPHING CALCULATOR IN THE DEVELOPMENT OF THE MADE OF BASIC EDUCATION, Subtil Manuela [et al.]	
	WeDRAW: USING MULTISENSORY SERIOUS GAMES TO EXPLOR CONCEPTS IN PRIMARY MATHEMATICS, Duffy Sam	E 467
	Author Index	472
9	SPONSORS	475