INDRUM2024
Fifth conference of the
International Network for Didactic Research in University Mathematics (INDRUM)
10–14 June 2024, Barcelona (Spain)
https://indrum2024.sciencesconf.org

PAPER PRESENTATIONS

	TWG1: Teaching and learning of calculus and analysis	TWG2: Teaching and learning of linear and abstract algebra	TWG3: Mathematics and other disciplines	TWG4: Teacher education and knowledge	TWG5: Teachers' and students' practices and experience
Times are indicative and may vary across TWGs	*E. Hanke, R. Martínez-Planell*	*Y. Fleischmann, M. Wawro*	*M. Bašić, I. Landgärds-Tarvoll*	*I. Ghedamsi, P. Nicolás*	*A. Thoma, O. Viirman*
Monday, 10 June, 17.15 - 18.15 THEMATIC WORKING GROUP SESSION 1: *introduction and organisation for the week*					
17.15-18.15	Introduction to TWG1	Introduction to TWG2	Introduction to TWG3	Introduction to TWG4	Introduction to TWG5
Tuesday, 11 June, 9.00 - 11.00 THEMATIC WORKING GROUP SESSION 2: PARALLEL PRESENTATIONS (1/3)					
9.00 - 9.05	Introduction to TWG1 - Session 2	Introduction to TWG2 - Session 2	Introduction to TWG3 - Session 2	Introduction to TWG4 - Session 2	Introduction to TWG5 - Session 2
9.05 - 9.25	Bauer, Biehler & Lankeit Designing a Concept Inventory for Real Analysis	Fleischmann & Lyse-Olsen Understanding eigentheory: The modes of thinking in students' works	Derouet, Doukhan & Sabra Analysing statistical teaching practices in a specific institutional context	Nicolás, Espín & Gascón Didactic paradigms in the study of real numbers in the Degree in Mathematics	Gildehaus (Un)doing gender in university mathematics - theoretical challenges and practical recommendations
9.25 - 9.45	Dreyfus, Elias, Kouropatov, Lax & Noah-Sella The complexity of mixed methods research – case study of a project on students' meanings for the fundamental concepts of calculus	Zamorano, Parraguez & Vera-Soria La ruta cognitiva sobre la noción de Isomorfismo de Espacios Vectoriales: el caso del profesor de Álgebra lineal	Doukhan, Gueudet, Quéré & Parra Investigating teachers' practices for non-specialist students	Planchon An experimentation to adress Klein's discontinuity in the case of the integral	Bolick, Pai, Funk, Voigt & Rader Learning to engage students as partners in critically-oriented reform of tertiary mathematics
9.45 - 10.05	Lanting, Kula, ten Klooster & van der Zaag Bridging Course: Why, How, and First Impressions	Docherty, Kinnear & O'Shea An Investigation of Features of Linear Algebra Peer Instruction Questions using Kelly's Repertory Grid Technique	González-Martín & Hernandes-Gomes Applications in Calculus courses in engineering: practices of teachers with different backgrounds	Bourgade & Durringer Klein's second discontinuity: the case of proportion theory	Hooper & Nardi How emergency remote teaching inspired a blended learning, flipped classroom intervention in a university mathematics course
10.05 - 10.25	Gabel & Leitner A small intervention: students' self work sessions in calculus lectures	Valenzuela, García-González, Sanz & García Caro Explorando concepciones previas sobre números complejos a través de la resolución de ecuaciones cuadráticas en estudiantes universitarios	Giacoletti-Castillo, Cordero & Mendoza-Higuera Categoría reproducción de comportamientos: una alternativa para la enseñanza de la transformada de Laplace en ingeniería	Paz-Corrales, Romo Vázquez, Moreno-Armella & Pérez-Sarmiento A path for addressing Klein's second discontinuity: Interplay between precision and approximation mathematics. The case of differential equations as mathematical models	Chevallard & Strømskag The concept of study and research inquiry: A foundational approach

10.25 - 10.45	Hogstad Engineering students' deed-oriented learning opportunities in a mathematical discourse about integrals	Arevalo-Meneses, Cabrera, Gaona, López, Montoya Delgadillo, Rodríguez, Vandebrouck & Vivier Paradigms of linear algebra	Pleština, Markulin, Ruiz-Monzón & Florensa How the Bologna Process changed the teaching of mathematics for engineering: the case of Croatia and Spain	Pollani, Branchetti & Morselli Interdisciplinarity and second transition: novices' attention towards examples in mathematics and physics	Lombard, Barquero, Bosch, Vásquez & Verbisck Addressing the implementation problem in university teaching education: the case of study and research paths
10.45 - 11.05					Kawazoe & Otaki How do Q-A logs support inquiry-based teaching? A case of a mathematical modelling course
Tuesday, 11 June, 11.30 - 13.00, THEMATIC WORKING GROUP SESSION 3: DISCUSSION OF PRESENTED PAPERS (1/3)					
11.30 - 13.00	DISCUSSION	DISCUSSION	DISCUSSION	DISCUSSION	DISCUSSION
Tuesday, 11 June, 14.30 - 16.30 THEMATIC WORKING GROUP SESSION 4: PARALLEL PRESENTATIONS (2/3)					
14.30 - 14.35	Introduction to TWG1 - Session 4	Introduction to TWG2 - Session 4	Introduction to TWG3 - Session 4	Introduction to TWG4 - Session 4	Introduction to TWG5 - Session 4
14.35 - 14.55	Durand-Guerrier & Planchon The study of functional equations to highlight the role of order in proof and proving at the interface between algebra and analysis	Wawro & Serbin Form-Function Relations for Eigentheory in Quantum Mechanics	Puchaczewski, Bosch & Stromskag The university perspective on modelling: An exploratory study	Nicolás, Gascón & Espín Didactics in the university teaching of mathematics	Modeste Students' perceptions of a Proof Assistant, in an introduction to proof course, in the first year of university mathematics
14.55 - 15.15	Winsløw What is important in undergraduate mathematics? Revisiting covariation through functional equations	Orozco-Santiago & Trigueros Students' understanding of spanning set from the APOS Theory	Hitier & González-Martín Derivatives in calculus and in mechanics. Missed opportunities in the context of free-fall	Ghedamsi, Vandebrouck & Lecorre Analogical transitions between teachers' mathematical knowledge: the category theory as a frame	Thoma & Iannone "The cost of mistake is nothing"□ - Exploring the development in student's activity using an interactive theorem prover
15.15 - 15.35	Hausberger & Hochmuth Structuralist praxeologies in the perspective of Klein: the case of connectedness in analysis	Hakamata, Yoshikawa & Ogawa Raison d'être of mathematical works and epistemological responsibility in inquiry: the case of the Fibonacci sequence under various moduli	Hellio, Gueudet & Caussarieu Mathematics in mathematics courses and mathematics in physics courses: toward a comparison method using praxeologies	Hoyos Conexiones entre las matemáticas universitarias y las matemáticas del bachillerato: La resolución general de las ecuaciones diofánticas	Kontorovich, Liu & Kang Transitioning to proof via writing scripts on the rules of a new discourse
15.35 - 15.55	Hanke & Hochmuth How many differentiable functions are there? – A reflection on functional thinking and the Baire category theorem as a component of mathematical horizon content knowledge	Göller, Kempen, Liebendörfer & Hausen Students' preferred resources for learning mathematics in an online linear algebra course	Bašić & Milin Šipuš Multivariable integrals for physicists - a concept or a tool?	Miranda The manipulation of a theorem to promote meaningful learning at the university level	Howard, Nic Mhuirí & OReilly Insights into transitions to, across and from university mathematics that arose through consideration of mathematical identity
15.55 - 16.15	Piña-Aguirre & Farfán Márquez Complex analysis task design through the notion of confrontation	Figueroa, Salgado & Trigueros The skateboard drawing of a linear system of equations.	Landgärds-Tarvoll Bridging the gap: curriculum development addressing the transition into mathematics in economics education	Cabrera Frequency calculation of trigonometric polynomials when modeling sound waves	Palisse, King & Maclean Comparative judgement and its impact on the quality of students' written work in mathematics
16.15 - 16.35					Alcock & Davies Believability in Mathematical Conditionals: A Comparative Judgement Study

Tuesday, 11 June, 17.00 - 18.30 THEMATIC WORKING GROUP SESSION 5: DISCUSSION OF PRESENTED PAPERS (2/3)					
17.00 - 18.30	DISCUSSION	DISCUSSION	DISCUSSION	DISCUSSION	DISCUSSION
Wednesday, 12 June, 9.00 - 11.00 THEMATIC WORKING GROUP SESSION 6: PARALLEL PRESENTATIONS (3/3)					
9.00 - 9.05	Introduction to TWG1 - Session 6	Introduction to TWG2 - Session 6	Introduction to TWG3 - Session 6	Introduction to TWG4 - Session 6	Introduction to TWG5 - Session 6
9.05 - 9.25	García-Amado, Oktaç & Villabona Poniendo la lupa en la Acción: ¿Qué tan sencilla o compleja puede ser?	Veuillez-Mainard Students' conceptions on the notion of a polynomial	Bennoun Students' Understanding of Time Series and Trajectory of Solutions to Differential Equations	Borji, Martínez-Planell & Surynkova Pre-service teachers' understanding of sine and cosine functions and their inverses based on the unit circle trigonometry	Bridoux & Grenier-Boley What teaching practices should be used to introduce the limits of functions in the first year of university? A case study
9.25 - 9.45	Branchetti & Leidi Change of meaning in learning activities about the tangent line and derivatives using DGS	Feudel, Mercan & Panse Students' understanding of the scalar product at the entry to university - Comparison of desirable and actual associations	Fernández Ruano, Cuadros, Martínez-Blasco, Baguena, Markulin, Serrano & Bosch Analysing the implementation of study and research paths: the students' voice	Hoffmann & Schlueter How Do Advanced Pre-Service Teachers Develop Congruence Theorems for Quadrilaterals?	Breen, Ní Shé & O'Shea Role of example generation in implicit and explicit conjecturing tasks
9.45 - 10.05	Martínez-Planell, Trigueros & Borji Building on slope: results of a second research cycle on the differential calculus of two-variable functions	Albano, Mariotti & Pierri Developing a formal attitude within a blended learning environment	Freixanet, Alsina Aubach, Bosch & Lombard The problematisation process in the teaching of statistics through study and research paths	Mizoguchi Designing inquiry teaching by pre-service teachers: Analysing their views of the lesson	Martín-Molina, Toscano, Fernández-León & Gavilán-Izquierdo "You're a mathematician [...] I'm more engineer" □: How a difference in educational background led to a commognitive conflict
10.05 - 10.25	Rubal, Milner & Jiménez Introduction of the notion of ordinary differential equation from the infinitesimal approach in calculus courses for engineering students		Verbisck, Fernández Ruano & Lombard A pilot study and research path of statistics at the university level	Hochmuth & Peters Sensitising teacher students for institutional obstacles in analysing content for lesson planning: Preliminary analysis of an intervention project	Norris & Viirman To prove or not to prove? A case study of one university mathematics lecturer's substantiation routines
10.25 - 10.45	Radmehr Didactic transposition of the fundamental theorem of calculus-Part 1: A comparative study of the knowledge to be taught at university and the taught knowledge in YouTube learning resources			Katalenic & Izmesij Insights from prospective primary and secondary teachers' lesson preparation in the context of division with different operands	Biza Agential participation in resource-rich problem-solving activity
10.45 - 11.05				Allmendinger, Aslaksen & Buchholtz Mathematical orientation as part of teaching competence	El Turkey, Cilli-Turner, Savić & Satyam Exploring conceptions of mathematical creativity: Calculus instructors' views

Wednesday, 12 June, 11.30 - 13.00, THEMATIC WORKING GROUP SESSION 7: DISCUSSION OF PRESENTED PAPERS (3/3)					
11.30 - 13.00	DISCUSSION	DISCUSSION	DISCUSSION	DISCUSSION	DISCUSSION
Wednesday, 12 June, 14.30 - 16.30 POSTER SESSION					
Thursday, 13 June, 11.30 - 13.00 THEMATIC WORKING GROUP SESSION 8: ***discussion and preparing TWG plenary presentation***					
11.30-13.00	DISCUSSION of TWG themes	DISCUSSION of TWG themes	DISCUSSION of TWG themes	DISCUSSION of TWG themes	DISCUSSION of TWG themes
Friday, 14 June, 9.00 - 10.00 THEMATIC WORKING GROUP SESSION 9 : ***preparing TWG plenary presentation***					
09.00-10.00	Preparing plenary presentation	Preparing plenary presentation	Preparing plenary presentation	Preparing plenary presentation	Preparing plenary presentation