Research group – Integrating Technology in Mathematics and Science Education

- **About Us:**

  The research group began its activities in November 2020 to investigate processes and characteristics of integrating diverse technologies in teaching and research. Key issues that the group chose to focus on: integrating technology into everyday life and teaching math and science - the different, the similar, and the different, attitudes of math and science teachers in the context of integrating technologies before and after the coronavirus, technology, and emotions.

Dr. Ruti Segal. Group leader - Faculty of Graduate Studies, Oranim Academic College, Tivon, Israel. Email: Segal_r@oranim.ac.il

Dr. Ruti Segal is the Department Chair of the master's program in Primary School Mathematics and Science (M. Ed), and Head of the Department of Mathematical Education in Primary School (B. Ed.). She teaches Mathematics Education at the Oranim College of Education, Tivon. She taught high school mathematics for 26 years. She also did public service as the senior high school, mathematics assistant, to the superintendent of school mathematics, in Israel. B.Sc. Mathematics and Computer Science. Haifa University, M.Sc. Mathematics and Education. Hebrew University, Jerusalem, Ph.D. Mathematics Education, Technion - Israel Institute of Technology, Haifa. Post-Doctoral fellow, Samuel Neaman Institute for National Policy Studies, Haifa, Israel. Dr. Segal's research focuses on teachers' professional development and includes exploring teachers' mathematical and pedagogical knowledge; surfacing processes in mathematics-oriented techno-pedagogical content knowledge, and improving professional development for pre-service and in-service mathematics teachers. As a part of the Postdoc, she has been investigating teachers' professional development within a community of practice. She has also been working on incorporating contemporary mathematics into high school mathematics education through the Mathematical News Snapshots initiative. As an academic advisor for the Video and Didactic (Vidactica) project that she conducted at the Weizmann Institute of Science, she studied how self-videotaping a lesson and subsequently carrying out a curiosity-driven discourse can enhance teachers' professional growth and development. In addition, she is engaged in research about imparting 21st-century skills within the framework of mathematical education and in particular in STEM education.

Dr. Anatoli Kouropatov is a senior lecturer of mathematics and mathematics education at The Academic Center Levinsky-Wingate, Israel. For decades Anatoli has worked as a mathematics educator, a developer of learning and teaching materials, and as a researcher. His current research is focused on cognitive and epistemological aspects of mathematics knowledge; on understanding both the mathematical and didactical impact of technological tools on students' knowledge construction; on pre and in-service mathematics teachers' education.

Dr. Anatoli Kouropatov. The Academic Center Levinsky-Wingate, Department of Mathematics, Tel-Aviv, Israel. Email: anatoliko@gmail.com

Dr. Shirley Miedijensky is a senior lecturer at the Faculty of Graduate Studies at Oranim Academic College. She received from the Technion-Israel Institute of Technology her B.Sc. in Biology, M.Sc., and Ph.D. in direct track in Science and Mathematics Education. As a Post-Doctoral fellow, she studied science learning environments for gifted students. She supervises graduate students and teaches graduate and undergraduate courses in the Department of Science and Mathematics Education and in the MTeach program. Dr. Miedijensky directed the Academic Portal of Oranim College and was a leading member in establishing the Unit for Online Studies in the college. She is a consultant to educational institutions on issues related to assessment, scientific and mathematical education, and nurturing the gifted. Dr. Miedijensk's research interests include science education, STEAM, metacognition, assessment in education, pedagogy, interdisciplinary learning, and teachers' professional development.

Dr. Shirley Miedijensky. Faculty of Graduate Studies, Oranim Academic College, Tivon, Israel. Email: shirley_m@oranim.ac.il

Ronit Herscu-Kluska is a lecturer in chemistry and science education at Oranim Academic College of Education. She received her Ph.D. in inorganic chemistry from Ben-Gurion University. Dr. Herscu-Kluska's research interests focus on teaching and learning chemistry and science across life from early childhood to the third age and older adults' education. She teaches Oranim courses related to STEM and research, in graduate, undergraduate and in-service programs. Dr. Herscu-Kluska is a member of the Israel Chemical Society, EARLI, and EAPRIL.

Dr. Ronit Herscu-Kluska. Faculty of Graduate Studies, Oranim Academic College, Tivon, Israel. Email: roniphd@gmail.com

Dr. Anat Klemer is interested in the field of Gamification and Innovation in Education at Western Galilee College. Head of the Teaching Committee for master's degree in Literacy and Innovation and Leading a mathematical literacy project in the community at Western Galilee College. Her Ph.D. in Mathematics Education from Haifa University was about Models to improve the understanding of the concepts of ratio and proportion. Dr. Klemer has produced e-learning programs for teaching mathematics at "Snunit – Galim" and at "Time to Know". She has directed the National Center for Mathematics Teachers in Elementary Education at the University of Haifa. Dr. Klemer leads community involvement projects in the field of mathematical education with children in preschool through the end of elementary school, in the city of Acre. In this framework, her students work under her guidance with children who have difficulty in mathematics. Her research interests focus on knowledge and understanding of maths concepts, as well as dealing with Problem Solving while modeling situations with ICT tools and physical manipulatives. The motivation for her work stems from the study of the psychological aspects of teaching and learning in mathematics.

Dr. Anat Klemer. Faculty of Education, Western Galilee College, Acre, Israel. Email: Anatkl@wgalil.ac.il

Dr. Iris Wagner-Gershgoren is a member of the Faculty of Graduate Studies at Oranim Academic College as a lecturer in the M.Ed. program in Science Education in primary and secondary schools and the M.Ed. program in Educational Leadership Management and Organization of Educational Systems. She received her B.Sc., M.Sc., and Ph.D. in Science and Technology Education from the Technion- Israel Institute of Technology. She was Head of the Evaluation field in the Center for the Advancement of Teaching and is currently the coordinator of the Teaching Quality Surveys Department. She was a partner in an international ARTIST project within the framework of the European ERASMUS+ program to promote science education by conducting action research. Her Academic discipline in teaching, research, and Master dissertations supervision are: (1) Science Education, Biology Education, Development of study units, creativity in science teaching, high-order thinking skills (2) Educational assessment and evaluation, alternative assessment, formative assessment, program evaluation, teacher evaluation and (3) Professional development of teachers, pre-service teacher education, educational leadership.

Dr. Iris Wagner-Gershgoren Faculty of Graduate Studies, Oranim Academic College, Tivon, Israel. Email: iris_vg@oranim.ac.il

Dr. Ira Raveh is a lecturer at the Department of Mathematical Education in Primary School at Oranim Academic College and a head of the Department of Teaching and General Studies at Braude Academic College of Engineering. She has developed and headed a Qualification of Engineers as Mathematics Teachers' Track. Additionally, she has acted as a coordinator of the Teaching Practicum program. She received from the Technion- Israel Institute of Technology her B.Sc., M.Sc., and Ph.D. in direct track in Mathematics Education. Dr. Raveh has Developed learning and teaching material for mathematical textbooks according to the program in Middle School and developed a Curriculum and Mathematical Education Syllabuses in M. Teach. Program at Teaching and General Studies in Braude Academic College of Engineering. Dr. Raveh's research interests include concepts of mathematical understanding and engineering understanding; career change to teaching and particularly engineers' career change to mathematics teachers; emotional aspects of lecturers in the transition to distance learning; cognitive aspects in spatial thinking and transfer between different mathematical representations; Mathematics and Science teacher's emotions during implementing technology in teaching and learning processes.

Dr. Ira Raveh. Braude Academic College of Engineering, Department of Teaching and General Studies Karmiel, Department of Mathematical Education in Primary School at Oranim Academic College, Israel. iraveh@gmail.com

Group 1:

This group focuses on various aspects during implementing technology in teaching and learning processes. What types of technologies do math and science teachers integrate through their teaching process, and what are the attitudes of teachers towards integrating technology before the outbreak of the Covid-19 and during the pandemic.

Research (group members' publications)

Klemer, A., Segal, R., Miedijensky, S., Herscu-Kluska, R., & Kouropatov, A. (2022). Changes in the attitudes of mathematics and science teachers toward the integration and use of computerized technological tools as a result of the COVID-19 pandemic (*submitted to International Journal*) (equal contribution)

Events (e.g., meetings, conference presentations)

Kouropatov, A., Hersu-Kluska, R., Klemer, A., Miedijensky, S., & Segal R. (2022). Digital tools before and since the outbreak of COVID-19 pandemic: mathematics and science teachers' priorities. CADGME 2022: Conference on Digit Tools in Mathematics Education. Israel: Jerusalem.(equal contribution)

Kouropatov, A., Hersu-Kluska, R., Klemer, A., Miedijensky, S., & Segal R. (2022). Mathematics and science teachers' attitudes towards using technology for learning before and during the pandemic. Online conference: ICT in education & training in times of pandemic. Universidad de Granada, Spain: ATEE (Association for Teacher Education in Europe).(equal contribution)

קלמר, א', סגל, ר', קורופטוב, א', מידז'נסקי, ש', הרשקו-קלושקה, ר', (2022). עמדות של מורים למתמטיקה ומדעים כלפי הידע הטכנולוגי שלהם בהוראה לפני ובמהלך מגפת הקורונה. הכנס הארצי השנתי להוראת מתמטיקה בחינוך העל יסודי: "מתמטיקה – להביט רחוק, לכוון גבוה". תל-אביב, ישראל

Links to Professional Networks

Group 2:

Dr. Iris Wagner- Gershgoen. Faculty of Graduate Studies, Oranim Academic College, Tivon, Israel. Email: iris_vg@oranim.ac.il

Dr. Irit Lavy. Faculty of education, Oranim Academic College, Tivon, Israel. Email: iritla1@gmail.com

Dr. Shirley Miedijensky. Faculty of Graduate Studies, Oranim Academic College, Tivon, Israel. Email: shirley_m@oranim.ac.il

Dr. Anat Klemer. Western Galilee College, Department of education, Acre, Israel, and Faculty of Graduate Studies, Oranim Academic College, Tivon, Israel Anatkl@wgalil.ac.il ORCID 0000-0002-0523-5787

Dr. Ira Raveh. Braude Academic College of Education, Department of Mathematics, Karmiel, Israel. Email: iraveh@gmail.com

This group focus on implementing technology, and Social Emotional Learning (SEL). In particular on technology and emotion. Pre-service and in-service Mathematics and Science teachers' emotions during implementing technology in teaching and learning processes.

Research (group members' publications)

Events (e.g., meetings, conference presentations

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