

## MMTS102 Integrating Digital Technology in the Mathematics Classroom

ECTS Value: 2 ECTS  
Self-Study Hours: 22

Contact Hours: 10  
Assessment Hours: 18

### Overall Objectives and Outcomes

Nowadays, digital technology permeates, enhances our lives and influences the way we interact with the world on virtually every aspect of life. Our millennial students have never known the world without digital technology and their lives seem to revolve around it.

By the end of this module, the learner will be able to:

#### Competences:

- a. Actively investigate the paradigm role of integrating technology in maths education and use case studies in literature as examples of dealing with different teaching strategies incorporating technology;
- b. Analyse and evaluate appropriate maths content and context which can be supported and enhanced with digital technology;
- c. Actively discuss and plan diverse digital resources for mental and oral work, demonstrations, whole class interactive teaching, group work, class discussions, plenary activities, diverse competence-based assessments as interactive exercises that facilitate the learning process;
- d. Integrate ICT into the Mathematics curriculum to foster teachers and students' ownership of their ICT rich learning environment;
- e. Develop an understanding the teacher's role in the presence of technology, and the potentialities of the great variety of the possible uses of new technologies for teaching, learning and assessing mathematics in class;

#### Knowledge:

- a. Critically discuss the general themes in technology integration in teaching, learning and assessment;
- b. Reflect on the constraints and the challenges of classroom management and student engagement in technology integrated practices;
- c. Propose ways of presenting content in an effective manner;
- d. Assess the use of several digital tools in the classroom

#### Skills:

- a. Digitally present mathematical content in an effective manner;
- b. Effectively make use of the internet to prepare lessons which stimulate teaching, learning and assessment practices;
- c. Effectively make use of several digital tools to prepare engaging lessons for learning and assessment practices;
- d. Effectively design activities and resources;
- e. Engage students in technology enhanced discussion, ICT class activities, digital inquiry based practical work, drill exercises, multiple-choice activities and varied assessment practices.

- f. Use a variety of tools and communication devices to maximise efficacy of one's maths teaching.
- g. Use diverse digital resources to support effective teaching;
- h. Use appropriate and varied communication and multimedia tools; Develop their own digital resources to support learning.
- i. Design teaching resources to observe patterns, develop visual imagery exploring data, such as graphs, transformations and shapes, construct mental calculations, drill exercises, and other mathematical concepts and skills which can be enhanced and visually stimulating by using digital resources;
- j. Design effective inquiry-based practical work and class activities;
- k. Produce appealing resources that facilitate learning

## Assessment Methods

This module will be assessed through: Assignment, Presentation and Resources

## Suggested Readings

### Core Reading List:

1. Borba M. C, Askar, P. (2017). Digital Technology in Mathematics Education: Research over the last decade
2. Letwinsky, K.M. (2017). Examining the relationship between Secondary Mathematics Teachers' Self Efficacy, Attitudes,
3. And Use of Technology to Support Communication and Mathematical Literacy. International Journal of Research in Education and Science (IJRES), 3(1), 56-66
4. Brothers, M. S. Walden University (2015). The Experiences of English Language Arts and Math Middle School Teachers with Integration of Digital Media into the Curriculum. Doctoral Study Submitted in Partial Fulfillment of the Requirements for the Degree of Doctor of Education
5. Stein, Hana, Gurevich, Irina, Gorev, Dvora, Education and Information Technologies, New York, Springer 1-21, (2019). Integration of Technology by novice mathematics teachers – what facilitates such integration and what makes it difficult?
6. Costica, L.(2014). The contribution of the new technologies to learning Mathematics.
7. Levinsen, K. et al. (2018). Digital Technology and Maths-Education: The Dilemma of Calculation and Conceptualisation 17<sup>th</sup> European Conference on e-learning, ECDL, 2018, Greece, Athens.
8. Olknow, A. & Knights. C. (2013). Mathematics Education with Digital Technology. Bloomsbury Publishing Plc.
9. Sinclair N, & Yerushalmy Michal (2016). Digital Technology in Mathematics Teaching and Learning. A decade focused on theorising and teaching. Researchgate.

### Supplementary Reading List:

1. Guggisberg L. S. (2015). Student Perception of Digital Resources and Digital Technology in a Flipped Classroom. A dissertation Submitted to the Graduate Faculty of the Faculty of the University of North Dakota in partial fulfillment of the requirements for the degree of Doctor of Education
2. ASING-CASHMAN, J.G. (2011). Technology modelling by mathematics professors in required courses for secondary mathematics pre-service teachers: A case study in two universities. A dissertation submitted to the Graduate School in partial fulfilment of the requirements for the degree Doctor of Philosophy

3. Guggisberg L. S. (2015). Student Perception of Digital Resources and Digital Technology in a Flipped Classroom. A dissertation Submitted to the Graduate Faculty of the Faculty of the University of North Dakota in partial fulfillment of the requirements for the degree of Doctor of Education.