

Course proposal

Theories and research methods in STEM education

Teacher(s)

Eleonora Faggiano (1 credit - 15 hours)

Antonella Montone (2 credits - 16 hours)

Course Website (optional)

Course description (min 150, max 300 words)

The course provides an in-depth study of the epistemological foundations of Mathematics and STEM Education, through the presentation of some theoretical research frameworks discussed in international literature and the research methodologies. In particular, the first part of the course will focus on the main theoretical frameworks of the Theory of Situations by Brousseau, of the Theory of Semiotic Mediation by Bartolini Bussi and Mariotti in a Vygotskian key, with particular reference to the synergy of artifacts of different nature (manipulative and digital) and to the production of signs, of the Duval and Radford's research on objectification. The second part concerns scientific research in STEM Education, a rigorous investigation process supported by appropriate theory and framework that guides it, the methods used in conducting the research and discussing the findings, and the standards for assessing the validity of the results. For this reason, the course will introduce and discuss different notions and roles of "theory" and the origin, nature, uses, and implications of specific theories pertaining to different types of such research. In particular, the focus is the formulation of the problem to be addressed and other key roles in the research design (methods and processes). The characteristics of quantitative, qualitative and mixed methods (e.g. machine learning for education, video analysis, triangulation design) will be described through the reading and analysis of examples. The nature of appropriate and productive criteria for assessing and increasing the quality of research proposals, projects, presentations and publications in STEM education, will be analysed and discussed.

The course will be structured through seminars, in which the topics will be presented, and laboratorial activities, in which the presented topics will be directly applied to work on real examples of data and research case studies.

Course period

March-May 2025

SSD

MAT/04

Course References (optional)

Credits and Hours

3 credits, two of lectures (8 hours) and one of practice (15 hour), for a total of 31 hours.

Exam Modality

Two alternatives are available to the student to pass this exam (Teacher(s) may choose other modalities):

- 1) Paper presentation. Students present the content of 2 papers suggested by the teachers. No groups are allowed.
- 2) Project. Students implement a review of 2 papers suggested by the teacher. No groups are allowed.

Teacher(s) CV

Attach or link a max 3 pages CV for each teacher proposing the course.

Teacher(s) Main Publications

List 10 main publications in the last 15 years for each teacher.

1. Faggiano E., Ferretti F., Arzarello F. (2023) How do primary teachers interpret and use standardized assessment: the case of the crochet placemats, in Proceedings of CERME12, Bolzano
2. Faggiano E., Monaco A., Rizzo O.G., Vaccaro V. (2023) An exploratory study on the connection between INVALSI assessment and mathematics teaching and learning processes at the Primary School level, In P. Falzetti (Ed.). The school and its protagonists: the teachers. V Seminar "INVALSI data: a tool for teaching and scientific research". (pp. 9-23), Franco Angeli
3. Faggiano E. (2022) The Semiotic Bundle as a reflective tool in pre-service mathematics teachers' education, *Frontiers in Education*, Sec. Teacher Education, 13, 104371
4. Swidan O., Faggiano E. (2021) Constructing shared mathematical meanings in the classroom with digital artifacts that simulate real-world phenomena, *MERJ - Mathematics Education Research Journal*, 34, 789–811
5. Faggiano E., Rocha H., Sacristan A.I., Santacruz Rodriguez M. (2021) Towards pragmatic theories to underpin the design of teacher professional development concerning technology use in mathematics. In Clark-Wilson et al. (Eds), *Mathematics Education in the Digital Age: Learning, Practice and Theory*, (pp. 42-68). ERME Series New Perspectives on Research in Mathematics Education, Routledge
6. Cusi A., Swidan O., Faggiano E., Prodromou T. (2020) The collaborative work on scenario design as a tool to foster teachers' professional development - In H. Borko & D. Potari (Eds.) *ICMI Study 25 Conference Proceedings*. (pp. 605–612)
7. Faggiano E., Mennuni F. (2020) Constructing mathematical meanings with digital tools: design, implementation and analysis of a teaching activity in a distance education context, *IxD&A Journal -Interaction Design & Architecture(s)*, 46, 156–174
8. Faggiano E., Montone A., Mariotti M.A. (2018) Synergy between manipulative and digital artefacts: a teaching experiment on axial symmetry at primary school, *IJMEST - International Journal of Mathematical Education in Science and Technology*, 49(8), 1165–1180
9. Faggiano E., Montone A., Rossi P.G. (2017). The synergy between Manipulative and Digital Artefacts in a Mathematics Teaching Activity: a co-disciplinary perspective. *JE-LKS. Journal of e-Learning and Knowledge Society*, 13, 33–45
10. Carreira S., Clark-Wilson A., Faggiano E., Montone A. (2017) From Acorns to Oak Trees: Charting Innovation Within Technology in Mathematics Education. In: E.

Faggiano F. Ferrara A. Montone (Eds). Innovation and Technology Enhancing Mathematics Education. (pp. 9–35), Springer

Eleonora Faggiano - Curriculum Vitae

ACADEMIC POSITION:

Associate Professor in Mathematics Education, since 2021, at the Department of Mathematics, University of BARI ALDO MORO (Italy)

Assistant Professor in Mathematics Education, from 2005 to 2021, at the Department of Mathematics, University of BARI ALDO MORO (Italy)

EDUCATION:

1999: Master's **Degree** in Mathematics – University of Bari

2001: Mathematics and Physics **Qualification for High School Teaching** - SSIS Puglia – University of Bari

2003: **International Summer School in Educational Technology** - Mekrijärvi Research Center - University of Joensuu - Finland.

2004: **II YESS Summer School in Mathematics Education** (Working Group on the use of Technology - chair C. Laborde) - European Society for Research in Mathematics Education - Pödebrady – Czech Republic.

2005: **PhD** in Computer Science - University of Bari. Supervisor: prof. V.L. Plantamura
Research topics: e-learning and educational technologies with application in mathematics education

Title of Thesis: A framework for supporting Web-based Cooperative Learning

2017: **National Scientific Qualification to be employed as Associate Professor** – SSD MAT/04 Complementary Mathematics – Mathematics Education

INTERNATIONAL PROFESSIONAL ACTIVITIES:

- **Editorial Board Member** - Mathematics Education in the Digital Era (MEDEra) Series - Springer
- Member of the **International Program Committee** of the following conferences:
 - 16th International Conference on Technology in Mathematics Teaching (ICTMT 15) - Athens (Greece), June 2023.
 - 13th ERME Topic Conference Mathematics Education in the Digital Age (MEDA 2022) - Role: **Conference Co-chair** - Nitra (Slovakia) – 7-9 September 2022.
 - 15th International Conference on Technology in Mathematics Teaching (ICTMT 15) - Copenhagen (Denmark), September 2021.
 - 10th ERME Topic Conference Mathematics Education in the Digital Age (MEDA 2020) - Role: **Conference Co-chair** - Linz (Austria) – online, September 2020.
 - 14th International Conference on Technology in Mathematics Teaching (ICTMT 14) - Essen (Germany), July 2019.
 - 5th ERME Topic Conference Mathematics Education in the Digital Age (MEDA 2018) - Role: **Conference Co-chair** - Copenhagen (Denmark), September 2018.
 - 13th International Conference on Technology in Mathematics Teaching (ICTMT 13) - Lyon (France), July 2017.
 - 12th International Conference on Technology in Mathematics Teaching (ICTMT 12) - Faro (Portugal), July 2015.
 - 11th International Conference on Technology in Mathematics Teaching (ICTMT 11) - Bari, July 2013.
 - Second International GeoGebra Conference – Role: **Co-chair** (with D. Kobal University of Lubiana) of the **Working Group** on Primary Education - Hagenberg (Austria) - August 2011.

- **Team Member** del **Thematic Working Group 16** on Learning Mathematics with Technology and Other Resources and **Editorial Board Member** of the Proceedings - 10th Congress of the European Society for Research in Mathematics Education (**CERME10**), Dublin (Ireland), February 2017 - 11th Congress of the European Society for Research in Mathematics Education (**CERME11**), Utrecht (Netherlands), February 2019 - 12th Congress of the European Society for Research in Mathematics Education (**CERME12**), Bolzano (Italy), February 2022, 13th Congress of the European Society for Research in Mathematics Education (**CERME12**), Budapest (Hungary), July 2023.
- **Co-Editor** of the following books:
 - “**Mathematics Education in the Digital Age: Learning, Practice and Theory**”, New Perspectives on Research in Mathematics Education Series - Routledge (with A. Clark-Wilson, A. Donevska-Todorova, J. Trgalova, H-G Weigand), 2021.
 - **Proceedings** of the 10th ERME Topic Conference Mathematics Education in the Digital Age (**MEDA 2020**), Johannes Kepler University, 2020.
 - **Proceedings** of the 5th ERME Topic Conference Mathematics Education in the Digital Age (**MEDA 2018**), University of Copenhagen, 2018.
 - “**Innovation and Technology enhancing Mathematics Education**”, published by Springer - MEDEra Series (with F. Ferrara e A. Montone), 2017.
 - **Proceedings** of the 11th International Conference on Technology in Mathematics Teaching (**ICTMT 11**), University of Bari, 2013.
- **Guest Co-Editor** of the following Journal Special Issues:
 - **IJRUME** “Digital Experiences in University Mathematics Education: Advances and Expectations” - Springer
 - **EDUCATION SCIENCES** “Methodological issues in STE(A)M Education” - MDPI
 - **TEAMAT** “Teaching Mathematics and its Applications” - Oxford University Press, Vol. 33 (1) (2014).
- **Ad hoc referee** and/or **reviewer** for **Journals, Books, Conferences**:
 - Journal of Mathematical Behavior (JMB) - Elsevier
 - Journal for Research in Mathematics Education – NCTM
 - Mathematics Education in the Digital Era (MEDEra) - Springer - **Book Series**
 - International Journal Mathematics Education Science Technology (IJMEST) - Taylor & Francis
 - International Journal for Technology in Mathematics Education (IJTME)
 - International Journal of Educational Research Open (IJEDRO) - Elsevier
 - **International Conferences** Frontiers In Education 2005, FIE 2006, Information Technology Education Joint Conference InSITE from 2006 to 2009, Congress of the European Society for Research in Mathematics Education CERME6 (TWG7), CERME10 e CERME11 (TWG16), International Conference on Education and Information Systems, Technologies and Applications EISTA since 2005, Informing Science Institute (since 2005).
- **Head of the GeoGebra Institute of Bari** (since 2010)
- **International activities and responsibilities** within the University of Bari Aldo Moro:
 - **Research and Teaching Advisor** for the research and teaching activities of Osama Swidan (Ben Gurion University of the Negev in Israel) as Visiting Professor at the Department of Mathematics - May/September 2019, July/December 2021, July/September 2022.
 - **Departmental Coordinator of Erasmus Agreements** with: University of Würzburg (since 2015), University of Duisburg-Essen (since 2018), Johannes Kepler University of Linz (since 2019), Norwegian University of Science and Technology (since 2019) and University of Frankfurt (since 2020).

RELEVANT NATIONAL PROFESSIONAL ACTIVITIES AND RESPONSIBILITIES:

- **Local Academic Research Advisor.** Research topic: “The use of resources to learn and teach mathematics, also in a relationship with other disciplines” - Contributo Ordinario sui Fondo di Ateneo - 2017 - 2019
- **Member of the research group** (coordinated by I. Vannini and F. Arzarello) on the National standardized assessment system INVALSI -Seminario permanente di ricerca su Didattica Generale e Didattiche Disciplinari - Società Italiana di Ricerca in Didattica (SIRD) – since 2017
- **Involvement in PhD courses:**
 - **Teaching Member:** Dottorato di Ricerca in “Informatica e Matematica” (XXIX, XXXVII and XXXVIII Ciclo) - University of Bari Aldo Moro (from 2013 to 2017 and from 2021 to present).
 - **Course:** “Theories and research methods in STEM education” - Dottorato di Ricerca in “Informatica e Matematica” XXXVIII Ciclo
 - **Tutor and thesis supervisor:** Dottorato in “Informatica e Matematica” (XXIX Ciclo) – University of Bari Aldo Moro. Title of the thesis: “Properties of Classical Differential Geometry for camera calibration in Computer Vision”.
 - **Teaching Member:** Dottorato di Ricerca (XXIV Ciclo) in “Storia e Didattica delle Matematiche, della Fisica, della Chimica” - University of Palermo (from 2010 to 2012).
 - **Referee:** Title of the thesis: “Graphical recognition of the properties of derivatives and anti-derivatives: analysis of different strategies using an eye-tracker” (Sapienza, 2023); “Convinzioni e cambi di convinzioni degli studenti sugli errori e sullo sviluppo della conoscenza in matematica (studenti di età 14 -18)” (Palermo, 2013).
- **Teacher educators in many different in-service and pre-service professional development courses**

RECENT RESEARCH INTERESTS AND COLLABORATIONS:

- **Teacher professional development concerning technology use in secondary mathematics.** Main collaboration on this topic with: A. I. Sacristan (Mexico), H. Rocha (Portugal), A. Clark-Wilson (UK).
- **Methodological and technological resources to foster teachers’ collaboration and professional development.** Main collaboration on this topic with: F. Arzarello and O. Robutti (University of Turin), A. Cusi (University of Rome La Sapienza), O. Swidan (Israel) and T. Prodromou (Australia).
- **The use of digital artifacts that simulate real-world phenomena to construct shared mathematical meanings in the classroom.** Collaboration with O. Swidan (Israel).
- **The Method of Variation Inquiry.** Collaboration with: F. Arzarello and O. Robutti (University of Turin), A. Cusi (University of Rome La Sapienza), F. Mennuni (University of Bari Aldo Moro) and O. Swidan (Israel).
- **Mathematics Education in the Digital Age: Learning, Practice and Theory.** Collaboration with A. Clark-Wilson (UK), A. Donevska-Todorova (Germany), J. Trgalova (France) and H.-G. Weigand (Germany).
- **Innovation and Technology Enhancing Mathematics Education.** Collaboration with F. Ferrara (University of Turin), S. Carreira (Portugal), A. Clark-Wilson (UK) and A. Montone (University of Bari).
- **The synergy between manipulatives and digital artefacts to construct mathematical meanings.** Collaboration with A. Montone (University of Bari), M. A. Mariotti (University of Siena), P. G. Rossi (University of Macerata).
- **Co-disciplinary design, development and analysis of mathematical e-learning situations.** Collaboration with P. G. Rossi (University of Macerata) and G. Albano (University of Salerno).

- **Connection between the National INVALSI standardized mathematics tests and the teaching practices at primary school level.** Collaboration with F. Arzarello (University of Turin), I. Vannini (University of Bologna), and other Italian researchers.

Antonella Montone is an Associate professor (SSD MAT/04) at the Department of Mathematics of the University of Bari Aldo Moro, since 21/12/2019. She is scientific director and coordinator of the Research Group in Mathematics Education of the Department of Mathematics of the University of Bari Aldo Moro. She is currently teaching Arithmetic for Primary School and Mathematics Education at the degree course in Science of Primary Education (i.e. five-years university curriculum which prepares students for teaching in kindergarten or in primary schools) and Mathematics Education for the second-level degree in Mathematics.

SCIENTIFIC ACTIVITIES

Prof. Montone's research activities in Mathematical Education, in collaboration with researchers and teachers of the schools, concern the research themes: Technological innovation in Mathematical Education: digital classroom, e-learning and their implications in the teaching-learning of Mathematics; Training and professional development of Mathematics pre-service and in-service teachers: the value of collective discussion and the feedback as a didactic, scientific and social training methodology; Analysis of the interaction between different semiotic systems, graphic, verbal and gestural, for the construction of mathematical meanings through the framework of the Semiotic Mediation Theory; Adults learning math and co-disciplinary aspects; Cooperative Learning, CSCL (Computer Supported Cooperative Learning) and their implications in the teaching-learning of mathematics, with particular attention to metacognitive aspects; Mathematics in Vocational school: reducing early school leaving caused by Mathematics and by a teaching disconnected from future professional activity.

She works on the application of the theory of Semiotic Mediation in didactic situations for the construction of mathematical meanings through the synergic use of artefacts of different nature, digital and manipulative. In particular, she focuses on the definition of the idea of synergy in the use of different kind of artefact, digital and manipulative, for the construction of mathematical meanings and on the role of the teacher as mediator and moderator during mathematical discussion, to foster the evolution of mathematical meanings in the transition from personal meaning to collective and from sharing back to individual generalization, in the vygotskijan perspective. In this work she analyzes through the video analysis the signs and the gesture during the interaction teacher-student. She also collaborates with experts in General Didactics to establish a fruitful dialogue between general didactics and mathematics didactics, led to a study on the issue of co-disciplinarity. The research on Mathematics Education has been launched through the use of technologies and on the study and development of teaching technologies. From this began a study on the role of the teacher and on the teacher's training on issues related to the vertical curriculum.

Through participation in the activities promoted by International Group for the Psychology of Mathematics Education (IGPME), prof. Montone was able to initiate research collaborations with researchers from other countries, which led to the drafting of a book chapter published by Springer, on the innovation within technology in Mathematics Education and of a book chapter on the lifelong education in mathematics for adult with the use of technology. Furthermore, on the study on "The importance of teachers' interpretative knowledge in and for promoting students' mathematical knowledge and understanding" she has started the research on teacher training. The role of the teacher will be studied in promoting meaningful mathematical discussions in the classroom for the construction of mathematical meanings and how to develop interpretative knowledge in the teacher.

She has published a paper in journal Je-LKS. (Journal of e-Learning and Knowledge Society), and is going to publish a paper (accepted and in printing) in the IJMEST (International Journal of Mathematical Education in Science and Technology), both ranked at the top level (fascia A) by the

ANVUR (the Italian National Agency for the Evaluation of University and Research). She has also published papers in the peer-reviewed Proceedings of the conference of the International Group for the Psychology of Mathematics Education, which includes experts from both Psychology and Mathematics

SCIENTIFIC AND ORGANIZING COMMITTEE

Referring to Mathematics Education, Educational Technology and Teacher Education, she has been member of various

- Scientific and Organizing Committee of conferences, including
 - At International level, ICTMT 11, 11th International Conference on Technology in Mathematics Teaching, and she was also responsible for the conference proceedings, Department of Mathematics of the University of Bari. 9-12 July 2013;
 - At National level, "La formazione degli insegnanti di matematica: i tempi, i modi, i luoghi", conclusive of the PRIN 2008 2008PBBWNT project, Department of Mathematics of the University of Bari, 24-25 February 2012;
 - XXXIV CONVEGNO UMI-CIIM "La matematica nella società in rapida evoluzione. Guardare al passato per le sfide del presente e del futuro", Department of Mathematics of the University of Bari, 6-8 October 2017;
- Scientific Committee of conferences
 - At International level, ICTMT 12, 12th International Conference on Technology in Mathematics Teaching, University of Algarve, Faro, Portugal, 24-27 June 2015;
 - At International level, ICTMT 13, 13th International Conference on Technology in Mathematics Teaching, Lyon, France, 3-6 Luglio 2017;
- Keynote speakers
 - at XXXIV Seminario Nazionale di Ricerca in Didattica della Matematica "G. Prodi" (February 2017)
 - at Discussion Group DG "How does mathematics education evolve in the digital era? Discussing a vision for mathematics education", at The 13th International Congress on Mathematical Education ICME 13, Luglio 2016, Hamburg (Germany)
- Plenary speaker
 - at CONVEGNO GIMAT, Giornate di Studio dell'Insegnante di MATEMATICA, II Edizione, "Matematica e Realtà, occasioni per apprendere", Department of Mathematics and Informatic of the University of Palermo, 20-21 October 2017;
- Organizing Committee of conferences, including
 - WORKSHOP One Day on e-learning for Math, Department of Mathematics of the University of Bari Aldo Moro. 20 June, 2017;
- Chairperson of
 - Working group 4 Geometry, at the 10th Congress of the European Society for Research in Mathematics Education CERME 10, February 2017, Dublin (Ireland);

SCIENTIFIC COORDINATION OF RESEARCH ACTIVITIES

- Direction as a Scientific Manager of the Research Group in Mathematics Education of the Department of Mathematics of the University of Bari (since 2016)
- Member of the PhD Committee in "Storia e Didattica delle matematiche, della fisica, e della chimica" XXIV CICLO, University of Palermo, DOT0520402, 2010-2013;
- Member (appointed) of the AIRDM council directive, Italian Association of Research in Mathematics Education, 2013-2016, 2016-2019;
- Member of the Faculty Board of the annual Master's Degree on Specific Learning Disabilities (DSA) "Didactics and Psychopedagogy for Specific Learning Disabilities", activated at the Department of Education, Psychology and Communication Sciences of the University of Bari, A.A. 2012/2013; 2015/2016;

RELEVANT PARTECIPATION TO RESEARCH PROJECT

She has been involved in many national project, among them are cited the following:

1. PRIN 2008 (protocollo n. 2008PBBWNT). "Insegnare matematica: concezioni, buone pratiche e formazione degli insegnanti". Title of the Bari Unit Project, "Formare gli insegnanti di matematica: alla ricerca di un nuovo modello per l'insegnamento-apprendimento anche in situazioni di disabilità e in relazione alle concezioni degli insegnanti nel caso specifico del contributo delle tecnologie". (2010-2012).
2. Component of GeoGebra Institute of Bari, Department of Mathematics of the University of Bari, whose aims are related to the training, research and development of the dynamic mathematics software GeoGebra
3. Expert Lecturer in the activities of the Polo Pugliese in the National Project "LINCEI PER UNA NUOVA DIDATTICA NELLA SCUOLA: UNA RETE NAZIONALE", born in 2011 from the Agreement between the Accademia Nazionale dei Lincei and the Ministry of Public Education, from 2013 to 2017.

PARTICIPATION IN EDITORIAL COMMITTEES OF JOURNALS AND EDITORIAL SERIES

- Editor of Special Issue: Papers from the 11th International Conference for Technology in Mathematics Teaching (ICTMT11), Teaching Mathematics and its Applications (2014) Oxford University Press, UK, Vol. 33 (1): 1-2. DOI: <https://doi.org/10.1093/teamat/hru007>
<http://teamat.oxfordjournals.org/content/33/1/1.extrac>;
- Editor of the first special issue of "L'insegnamento della matematica e delle scienze integrate" , Vol.38 A-B N.3 – Maggio-Giugno 2015, ISSN 1123
- Editor of volume "Innovation and Technology enhancing Mathematics Education. Perspectives in the Digital Era." ISBN: 978-3-319-61487-8, published in the Springer Series: "Mathematics Education in the Digital Era", ISSN: 2211-8136.
(<http://www.springer.com/it/book/9783319614878>)
- Member of Editorial Board of Rivista Scientifica "Quaderni di Ricerca in Didattica" Sez A. QRDM (Mathematics), ISSN on-line 1592-4424 (cfr. pagina web http://math.unipa.it/%7Egrim/menu_quaderni.htm)

Pubblicazioni

Journals e riviste (with referee):

1. Fiorentino M.G., **Montone A.**, Ricciardiello G., Pertichino M. (2021) "La matematica negli istituti professionali: una ricerca per ridurre la dispersione scolastica" in "L'Insegnamento della Matematica e delle Scienze Integrate", vol. 44B n.4 Ottobre 2021, ISSN 1123-7570
2. Maria Alessandra Mariotti, **Antonella Montone** (2020). The Potential Synergy of Digital and Manipulatives Artefacts. DIGITAL EXPERIENCES IN MATHEMATICS EDUCATION, vol. 6(2), p. 109-122, ISSN: 2199-3254, doi: 10.1007/s40751-020-00064-6
3. **Antonella Montone**, Michele Romita, Michele Fiorentino, Michele Pertichino (2020). In-service teachers' training on the integrated use of digital tools through the usage of e-learning platforms: "Introspectum"

project. QUADERNI DI RICERCA IN DIDATTICA, vol. Quaderno numero speciale 8, p. 99-106, ISSN: 1592-4424

4. Faggiano E, **Montone A.**, Mariotti M.A., (2018), Synergy between manipulative and digital artefacts: a teaching experiment on axial symmetry at primary school, *IJMEST - International Journal of Mathematical Education in Science and Technology*, Taylor & Francis, ISSN 0020-739X, DOI: 10.1080/0020739X.2018.1449908
5. Di Paola B., **Montone A.** (2018), Mi descrivi il tuo disegno del mattoncino lego? Un'esperienza didattica di matematica nella scuola dell'infanzia, *Didattica della Matematica. Dalla ricerca alle pratiche d'aula*, 2018 (4), p. 27-49, ISSN 2504-5210
6. **Montone A.** (2017), The design of a vertical curriculum: travelling with mathematics, *Education Sciences & Society*, 2/2017, doi: 10.3280/ESS2-2017OA5536
7. Faggiano E., **Montone A.**, Rossi P.G. (2017). The synergy between Manipulative and Digital Artefacts in a Mathematics Teaching Activity: a co-disciplinary perspective, *JE-LKS. Journal of e-Learning and Knowledge Society*, vol. 13, p. 33-45, ISSN: 1971-8829, doi: 10.20368/1971-8829/1346
8. Faggiano E., Fiorentino M.G., **Montone A.**, Pertichino M., Rossi P.G. (2017) Dialogo tra Didattica della Matematica e Didattica Generale: problemi e sinergie, *Italian Journal of Educational Research*, Numero Speciale, p. 255-272, ISSN 2038-9744
9. Faggiano E., **Montone A.** (2017) Artefatti manipolativi e virtuali in sinergia per la concettualizzazione della simmetria assiale nella Scuola Primaria, *Insegnamento della Matematica e delle Scienze Integrate*, Vol 40. A-B N.2, pp. 181-204, ISSN 1123-7570
10. **Montone A.** (2017). Il ruolo dell'insegnante e l'uso sinergico e consapevole di artefatti: la realtà delle simmetrie assiali nella Scuola Primaria, *Quaderni di Ricerca in Didattica (Mathematics) (QRDM)*, Palermo: G.R.I.M., vol. 27 supplemento n.1, 2017., p. 51-57, ISSN 1: 1592-4424, ISSN 2: 1592-5137
11. Faggiano E., Ferrara F, **Montone A.** (2014), Special Issue: Papers from the 11th International Conference for Technology in Mathematics Teaching (ICTMT11) - Editorial, *Teaching Mathematics and its Applications*, Oxford University Press, Volume 33, Issue 1, March 2014, pp. 1-2, ISSN 0268-3679

International Conference (with referee):

12. Di Paola, B., Fiorentino, M.G., Montone, A. (2022). Playing in Preschool Mathematics Education during SARS-CoV-2 pandemic: a phenomenological study with Italian teachers. POEM 22 - Teaching mathematics as to be meaningful – foregrounding play and children's perspectives., May 2022, Gothenburg, Sweden. (hal-03914159)
13. Michele Giuliano Fiorentino, **Antonella Montone**, Pier Giuseppe Rossi, Agnese Ilaria Telloni (2022). Pre-service primary teachers' professional development through an educational path in remote learning designed with an interdisciplinary perspective. In BOA of HELMeTO2022, p. 141-143, ISBN 978-88-99978-52-5, Palermo, 21-23 Settembre 2022.
14. Michele Giuliano Fiorentino & **Antonella Montone** (2022). The role of feedback in a formative assessment path for pre-service Mathematics teachers: the case of rational numbers. In BOA of HELMeTO2022, p. 132-134, ISBN 978-88-99978-52-5, Palermo, 21-23 Settembre 2022.

15. **Antonella Montone**, Pier Giuseppe Rossi, Agnese Ilaria Telloni (2021). Promoting pre-service teachers' evolution in Radford's levels of generalization through the Core Concepts. In: (a cura di): M. Inprasitha N. Changsri & N. Boonsena, Proceedings of PME 44. vol. 1, p. 167, Khon Kaen, ISBN: 978-616-93830-0-0, virtual, 19-22 July 2021
16. Benedetto Di Paola, **Antonella Montone**, Giuditta Ricciardiello (2020). Drawings, Gesture and Discourse: A Case Study with Kindergarten Students Discovering Lego Bricks. In: (a cura di) Martin Carlsen, Ingvald Erfjord, Per Sigurd Hundeland, Mathematics Education in the Early Years. p. 199-212, Switzerland AG: Springer, ISBN: 978-3-030-34775-8, doi: 10.1007/978-3-030-34776-5_12
17. Faggiano E., **Montone A.**, Fiorentino M.G., Mariotti M.A. (2017) *An interactive book on axial symmetry and the synergic use with paper and pin*, in Aldon & Trgalova (Eds) Proceedings of the 13th International Conference on Technology in Mathematics Teaching, <https://hal.archives-ouvertes.fr/hal-01632970>, p. 368-377
18. **Montone A.**, Faggiano E., Mariotti M.A., (2017) *The design of a teaching sequence on axial symmetry, involving a duo of artefacts and exploiting the synergy resulting from alternate use of these artefacts*, in Dooley, T., & Gueudet, G. (Eds.) Proceedings of the Tenth Congress of the European Society for Research in Mathematics Education (CERME10, February 1-5, 2017). Dublin, Ireland: DCU Institute of Education and ERME, p. 653-660, ISBN 978-1-873769-73-7
19. Faggiano E, **Montone A**, Mariotti M A, (2016), *Creating a synergy between manipulatives and virtual artefacts to conceptualize axial symmetry at Primary School*, in Csikos, C., Rausch, A., & Sztányi, J. (Eds.). Proceedings of the 40th Conference of the International Group for the Psychology of Mathematics Education, Szeged, Hungary: PME, Vol. 2. 235-242
20. Faggiano E, **Montone A**, Pertichino M, (2015), *About the awkward process of integrating technology into math class*, In Proceedings of ICTMT12
21. **Montone A**, Faggiano E, Fiorentino M G (2015), *Conceptualising axial symmetry through the use of cabri elem within an integrated laboratory approach*, In Proceedings of ICTMT12
22. Faggiano E, **Montone A**, Pertichino M, (2014), *Integrating technology in math class: how, when and why?* In Oesterle, S., Nicol, C., Liljedahl, P., & Allan, D. (Eds.). Proceedings of the Joint Meeting of PME 38 and PME-NA 36 (Vol. 6). Vancouver, Canada: PME., p. 66, ISBN 978-0-86491-366-1
23. **Montone A**, Faggiano E, Pertichino M, (2014), *Fostering autonomy in cognitive disabled students through mathematics*. In Oesterle, S., Nicol, C., Liljedahl, P., & Allan, D. (Eds.). Proceedings of the Joint Meeting of PME 38 and PME-NA 36 (Vol. 6). Vancouver, Canada: PME., p. 381, ISBN 978-0-86491-366-1
24. **Montone A**, Faggiano E, Pertichino M, Fiorentino M.G. (2014), *Fairy tales in primary schools: mathematical thinking through creativity, fantasy and imagination*. In *Proceedings of the 3rd International Constructionism Conference: Constructionism and creativity* (Eds Futschek G, Kynigos C), Wien, August 19 - 23, pp. 506-512, ISBN: 978-3-85403-301-1

Convegni Nazionali:

25. Fiorentino M. G., Montone A., Ricciardiello G. (2022) "La co-disciplinarietà tra matematica e ... nella scuola secondaria: un'arma per combattere la dispersione scolastica" In quaderni Grimed n°xx:, (accettato in stampa)

26. Ricciardiello G., Fiorentino M.G., Montone A., (2022), Frazioni e numeri razionali: mai più le torte! In (a cura di) D'Amore B., Didattica della Matematica come attività di ricerca in aula. Atti del XXXVI Convegno Nazionale Incontri con la matematica, Castel San Pietro (Bo), p. 111-112, ISBN 88-3712154-9, 21-23 Ottobre 2022.
27. Da Pelo P., Montone A. (2022). "Qual è il trucco?" La matematica dei giochi di magia: un percorso di Liceo Matematico. In (a cura di) D'Amore B., Didattica della Matematica come attività di ricerca in aula. Atti del XXXVI Convegno Nazionale Incontri con la matematica, Castel San Pietro (Bo), p. 145-146, ISBN 88-3712154-9, 21-23 Ottobre 2022.
28. Fusco N., Fiorentino M. G., Montone A. (2022). "Dal Casinò alla Criminologia: un Percorso sulla Probabilità nel Liceo ad Indirizzo Matematico.". In (a cura di) D'Amore B., Didattica della Matematica come attività di ricerca in aula. Atti del XXXVI Convegno Nazionale Incontri con la matematica, Castel San Pietro (Bo), p. 151-152, ISBN 88-3712154-9, 21-23 Ottobre 2022.
29. Montone A., Fiorentino M. G., Ricciardiello G., (2021), "La costruzione di isometrie nella realtà, tra artefatti manipolativi e digitali, da una "vignetta Klein"". In atti di DI.FI.MA. 2021, Apprendimento laboratoriale in Matematica e Fisica in presenza e a distanza, 11-13 Ottobre 2021, Torino, (accettato in stampa)
30. Fiorentino M. G., Fusco N., Montone A., (2021), Una piacevole sinfonia: matematica e musica. In atti di DI.FI.MA. 2021, Apprendimento laboratoriale in Matematica e Fisica in presenza e a distanza, 11-13 Ottobre 2021, Torino, (accettato in stampa)
31. **Antonella Montone**, Luigi Tomasi (2021). La trasposizione didattica della vignetta "Isometrie passo passo": progetto Klein Italia. In atti di DI.FI.MA. 2021, Apprendimento laboratoriale in Matematica e Fisica in presenza e a distanza, 11-13 Ottobre 2021, Torino, (accettato in stampa)
32. Eleonora Faggiano, **Antonella Montone** (2019). Artefatti digitali e artefatti manipolativi in sinergia: il ruolo di GeoGebra. In: Atti del VIII Convegno Nazionale DI.FI.MA 2017. p. 46-58, ISBN: 978-88-99781-37-8
33. Fiorentino M. G., **Montone A.**, Pertichino M., Ricciardiello G., (2018), Sacchetti, conigli e robot: dal gioco alla costruzione del significato di Numero Naturale, In (a cura di) D'Amore B., Sbaragli S., *Incontri con la Matematica n. 32, La Didattica della Matematica, strumento concreto in aula*. Castel san Pietro Terme (Bo), Pitagora Editrice Bologna, pp. 101-102, ISBN 88-371-2100-6.
34. Faggiano E., Fiorentino M.G., **Montone A.**, Pertichino M., Gugliotta E., Pagone M., Pupillo R., Ricciardiello G., Troccoli A., (2017), "Un progetto in didattica della matematica: "riconoscersi" tra insegnanti di scuola primaria e secondaria di primo grado su contenuti, metodologie e valutazione" in: *Quaderni Grimed n°3: Una feconda contraddizione didattica individualizzata vs didattica cooperativa? Il problema della valutazione all'incrocio tra le due didattiche*, Ed. Il Capitello, pp. 29-38, ISBN 9788842691549
35. Di Paola M.A., **Montone A.**, Ricciardiello G., (2017), *La Didattica Cooperativa per promuovere l'inclusione e il successo formativo di tutti e di ciascuno: le superfici piane e l'equiestensione con bambini DSA*, in: *Quaderni Grimed n°3: Una feconda contraddizione didattica individualizzata vs didattica cooperativa? Il problema della valutazione all'incrocio tra le due didattiche*, Ed. Il Capitello, pp. 102-112, ISBN 9788842691549
36. Fiorentino M.G., **Montone A.**, Pertichino M., (2017), Disequazioni e sistemi di disequazioni per i cuochi: l'insegnamento dell'algebra in un Istituto Professionale Alberghiero, In (a cura di) Robutti O., sabena C.,

- Mosca M., *Atti del VII Convegno Nazionale DI.FI.MA 2015, Insegnare e imparare Matematica e Fisica: insegnanti e studenti per una didattica inclusiva*, Milano: Ledizioni, pp. 271- 279, ISBN 978-88-67056-22-4
37. Pupillo R., Turi A., **Montone A.**, (2017), Geogebra in un campo di calcio, In (a cura di) Robutti O., Sabena C., Mosca M., *Atti del VII Convegno Nazionale DI.FI.MA 2015, Insegnare e imparare Matematica e Fisica: insegnanti e studenti per una didattica inclusiva, Sez. Geogebra Day*, Milano: Ledizioni, pp. 565- 578, ISBN 978-88-67056-22-4
38. Fiore C., **Montone A.**, Pagone M., Pertichino M. (2015), *Rappresentare e rappresentarsi: la matematica in scena fra Scuola dell'Infanzia e prima classe della Scuola Primaria*, in Robutti O. E Mosca M. (a cura di), atti del VI Convegno Nazionale DI.FI.MA 2013, Torino, Ledizioni, Milano, pp. 317-324, ISBN 978-88-6705-353-7
39. **Montone A.**, Pertichino M, Faggiano E, Fiorentino MG, (2015), La creatività e le fiabe come strumenti di costruzione del pensiero matematico nella scuola primaria. In: Corni F., Altiero T., (a cura di), *Innovazione nella didattica delle scienze nella Scuola Primaria e dell'Infanzia: al crocevia fra discipline scientifiche e umanistiche*. Atti del convegno, articoli selezionati, p. 237-252, Mantova: Universitas Studiorum SRL, ISBN: 978-88-99459-28-4
40. Pertichino M, **Montone A.**, Fiore C, Pagone M, (2015), *Matematica in scena: travestimenti, personaggi e storie attraverso i concetti matematici*. In: *Innovazione nella didattica delle scienze nella scuola primaria e dell'infanzia: al crocevia fra discipline scientifiche e umanistiche, articoli selezionati*, VOL. III, P. 211-236, Mantova: Universitas Studiorum SRL, ISBN: 978-88-99459-28-4

Monografie

Book-chapters (with referee):

41. Abbaticchio R., Perla L., **Montone, A.** (2020). Didattica dell'italiano tra dimensione specialistica e dimensione trasversale. Esperienze di formazione docenti. In: Vari. (a cura di): Perla L., *Testimoni di sapere didattico. Vent'anni di formazione*. vol. i
42. **Antonella Montone**, Michele Giuliano Fiorentino, Maria Alessandra Mariotti (2019). Learning translation in geometric transformations through digital and manipulative artefacts in synergy. In: (a cura di) P. Zaphiris A. Ioannou, *Learning and Collaboration Technologies. Designing Learning Experiences. LECTURE NOTES IN COMPUTER SCIENCE*, vol. 25, p. 191-205, Springer Nature Switzerland AG 2019, ISBN: 978-3-030-21813-3, ISSN: 0302-9743, doi: 10.1007/978-3-030-21814-0_15
43. **Montone A.** (2019) *Le tecnologie e la didattica della matematica*, In: Rivoltella P.C., Rossi P.G. *Tecnologie per l'educazione*. p. 263-272, Pearson Italia, ISBN: 9788891909336
44. Ferrara F., Faggiano E., **Montone A.** (2017) *Introduction: Innovative Spaces for mathematics education with technology*, In: E. Faggiano F. Ferrara A. Montone. *Innovation and Technology Enhancing Mathematics Education*. p. 1-5, Springer, ISBN: 978-3-319-61488-5, DOI: 10.1007/978-3-319-61488-5_1
45. Carreira S., Clark-Wilson A., Faggiano E., **Montone A.** (2017) *From Acorns to Oak Trees: Charting Innovation Within Technology in Mathematics Education*. In: E. Faggiano F. Ferrara A. Montone. *Innovation and Technology Enhancing Mathematics Education*. p. 9-35, Springer, ISBN: 978-3-319-61488-5, DOI: 10.1007/978-3-319-61488-5_2

Books and Curatele:

46. Faggiano E., Ferrara F., **Montone A.** (2017). *Innovation and Technology enhancing Mathematics Education. Perspectives in the Digital Era*. Springer, ISBN: 978-3-319-61488-5, DOI: 10.1007/978-3-319-61488-5
47. Maracci M., **Montone A.**, Bartolini Bussi M.G., Boero P. (a cura di) (2015). *L'insegnamento della Matematica e delle Scienze Integrate - Numero Speciale AIRDM*, vol. 38 a-b, Paderno del Grappa: Organo del Centro Ricerche Didattiche Ugo Morin - Istituti Filippin - Paderno del Grappa, ISSN: 1123-7570
48. Faggiano E., Ferrara F., **Montone A.** (Eds) (2014). *Teaching Mathematics and its Applications – Special Issue*, Oxford University Press, Volume 33, Issue 1, March 2014, ISSN 0268-3679
49. Faggiano E., **Montone A.** (Eds) (2013). *Proceedings of ICTMT11*. Bari: Università degli Studi di Bari "Aldo Moro", ISBN: 978-88-6629-000-1

Altro

50. AA. VV. (tra cui Montone A.), (2021) Valutazione tramite workshop di peer-review, a cura del gruppo Umi – Digimath, <https://sites.google.com/unisa.it/digimath/prodotti/formazione03?authuser=0>
51. AA. VV. (tra cui Montone A.), (2021) Task Interpretativi, a cura del gruppo Umi – Digimath, <https://sites.google.com/unisa.it/digimath/prodotti/formazione01?authuser=0>

52.

Data

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