

University Academic Curriculum Vitae

Personal information Name: Miglena Asenova

Education since leaving school

- year and title of first degree; (and university): 1995 Business Management (Otto-von-Guericke-Universität Magdeburg, Germany)
- year and title of second degree; (and university): 2017 Master's Degree in Mathematics (University of Modena and Reggio Emilia)
- year and title of post-graduate degrees (and university): 2007 Scuola di Specializzazione per l'Insegnamento Secondario (SSIS) (University of Bologna)
- year, subject area and title of PhD (and university): Mathematics and Computational Sciences with Thesis in MAT 04, Mathematics Education (University of Catania); Title: "Categorical Definition of Mathematical Object in Mathematics Education Research"

Present appointment

- Title of appointment: Assistant Professor.
- Start of appointment: September 1st, 2021.
- Level of appointment: Pre-tenure (RTD A).
- Employer: Free University of Bolzano.
- Brief description of responsibilities: researcher in MAT04-Mathematics Education.

Professional experience Chronological list of all previous employments (each with job title, starting and finishing dates, level, employer, responsibilities)

From / to	Job title	Name of academic Institution	Academic level	Responsibilities
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2021-2024	Contract Professor	University of Modena and Reggio Emilia		<ul style="list-style-type: none"> • Academic teaching activity: Course in History of Mathematics and in Mathematics Education
2018-2021	Contract Professor	University of Bozano		<ul style="list-style-type: none"> • Academic teaching activity: Mathematics Education Laboratory, undergraduate students of the Faculty of Education.
2016-2021	High School Teacher	IIS "A. Baggi" Sassuolo (MO)		<ul style="list-style-type: none"> • Teacher in Mathematics • Member of the headmaster's staff responsible for the school's educational project (PTOF), evaluation (RAV) and improvement of the teaching processes (PdM)
2015/2016	High School Teacher	I.T.C.G. "A. Paradisi", Vignola (MO); I.T.C.G. "J.; Barozzi", Modena		<ul style="list-style-type: none"> • Mathematics teacher
2014/2015	High School Teacher	I.T.C.G. "A. Baggi", Sassuolo (MO)		<ul style="list-style-type: none"> • Special education teacher covering scientific subjects, languages and humanities
2012/2014	High School Teacher	I.P.S.I.A. "A. Ferrari", Maranello (MO)		<ul style="list-style-type: none"> • Special education teacher covering scientific subjects, languages and humanities
2011/2012	High School Teacher	I.T.I. "Primo Levi, Vignola (MO)		<ul style="list-style-type: none"> • Mathematics teacher
2010/2011	High School Teacher	I.T.C. "A. Paradisi", Vignola (MO)		<ul style="list-style-type: none"> • Mathematics teacher
2008/2010	High School Teacher	I.T.C. "G. A. Cavazzi", Pavullo nel Frignano (MO)		<ul style="list-style-type: none"> • Mathematics teacher
2013	2023	INVALSI		<ul style="list-style-type: none"> Task designer and evaluator for the National INVALSI test in Mathematics

Experience in academic teaching

- AA 2021/2022, 2022/2023, 2023/2024: Course "History of Mathematics"; University of Modena and Reggio Emilia (Mark of last course evaluation: 100% of positive responses).
- AA 2022/2023: "Mathematics Education"; University of Modena and Reggio Emilia (Mark of last course evaluation: 100% of positive responses).
- AA 2021/2022: Seminar titled "Research Paradigms and other

(un)comfortable issues”, hold at the Doctorate Course in Pedagogia speciale, Didattica generale e Didattica disciplinare della t the Univesrity of Bolzano.

- AA 2020/2021: Seminar titeled “Categorical definition of Mathematical Object specific to Mathematics Education”, hold at the Doctorate Course tenuto in Enfasis Matemática at the Universidad Distrital José de Caldas di Bogotá, Colombia.
- AA 2018/2019, 2019/2020, 2020/2021, 2021/2022, 2022/2023: “Grundlagen der Mathematik und ihrer Didaktik mit besonderer Berücksichtigung der Altersstufe (0)-2-7”; University of Bolzano, MAT/04, undergraduate level.
Mark over two years of course evaluation: 97,17% of positive responses.
- AA 2018/2019: Seminar titeled “L’evoluzione epistemologica del concetto di dimostrazione nella tradizione occidentale”, hold at the University of Parma.
- AA 2023/2024: Masters Thesis Direction in Mathematics Education, Masters Degree in Mathematics, University of Modena and Reggio Emilia; Thesis titled “Un’indagine sulla concettualizzazione dinamica della densità di \mathbb{Q} in \mathbb{R} . Analisi delle concezioni spontanee e delle argomentazioni degli studenti di Scuola Secondaria di Secondo Grado”
- AA 2023/2024: Masters Thesis Direction in Degree in Educational Sciences at the University of Bolzano; Thesis titled “Degree in Educational Sciences at the University of Bolzano; Thesis titled “Präkonzepte von Kinder im Kindergarten und im ersten Schuljahr über mehrstellige Zahlen”
- AA 2021/2022: Masters Thesis Direction in Degree in Educational Sciences at the University of Bolzano; Thesis titled “Einsatz des Bilderbuchs in der frühen mathematischen Bildung”;
- AA 2020/2021: Thesis co-direction in Degree in Educational Sciences at the University of Bolzano; Thesis titled “Moltiplicare come processo di oggettivazione. Un incontro tra la cultura germanica e quella italiana”.

Other academic responsibilities

- November 2023: Co-Editor of the Proceedings of the Annual National Conference “Incontri con la Matematica”;
- Since 2023: Member of the Organizing Committee of CERME 14 (<https://www.cerme14.it/>);
- Since November 2021: Co-Editor in Chief of the Journal “La matematica e la sua didattica”;
- Since 2021: member of the Editorial board of the “Mediterranean Journal for Mathematics Education”;
- Since 2012: member of the Organizing Committee of the National Conference “Incontri con la matematica”;
- Since 2017: member of the Editorial board of the Journal “La matematica e la sua didattica”;

Memberships

- Since 2020 member of the research web RICTO on the Theory of Objectification;
- Since 2017 member of the AIRDM (Italian Association for Research in Mathematics Education);
- Since 2017 member of the ERME (European Association for Research in Mathematics Education);
- Since 2018 member of the UMI (Italian Mathematical Union);
- Since 2013 member of the NRD research group of the University of Bologna (since 2009 member of the RSDDM Group of the same

University);

- From 2017 to 2023: member of the GL08 of the INVALSI-task team of Mathematics (from 2013 to 2023 task author for INVALSI).

Research and scholarships

- My research focuses on three main areas: (1) Foundational and epistemological issues in Mathematics Education research with a focus on the relations between mathematical objects in Mathematics Education research and in Mathematics, as well as the metaphorical use of category-theoretical tools for modeling in Mathematics Education research (Publications: PhD thesis published as a book; an article written with two Italian scholars and published in an international journal; an article with the same co-authors submitted to an international journal; a conference proceedings-contribution in the proceedings of an international conference); (2) Argumentation and proof in Mathematics Education research, as well as the use of non classical logic as a tool for analysis of argumentations and proofs in Mathematics Education research (Publications: three contributions in the proceedings of an international conference; two articles in international journals as extended versions of two of the three conference contributions; selected presentation for whole working group discussion at the CERME 13 conference); (3) The role of semiotics in Mathematics Education research and the definition and operationalization in teacher training of the concept of Semiotic Interpretative Knowledge (SIK), together with other three Italian scholars (Publications: one article in international journal; two conference contributions in the conference proceedings of international conferences; a book chapter; a presentation at the National Italian Seminar in Research in Mathematics Education; one presentation in a national conference); (4) the role of the number line in number conceptualization (work in progress).
- I am co-investigator in two research projects: (1) Erasmus + Project “Diagnostic Tool in Mathematics” (2022-2025); PRIN-Project “Mathematics standardized assessment as a tool for teachers’ professional development” (2023-2025).

Publications

Books authored

01. Asenova, M., D’Amore, B., Fandiño Pinilla, M.I., Fúneme Mateus, C.C., Iori, M., & Santi, G. (2024). *Teorías relevantes en Educación Matemática*. Bogotá: Magisterio. [Spanish translation of the Italian version published in 2023; see below].
02. Asenova, M., D’Amore, B., Fandiño Pinilla, M.I., Funeme, C.C., Iori, M., & Santi, G. (2023). *Teorie rilevanti in Didattica della Matematica*. Bologna: Bonomo.
03. Asenova, M., D’Amore, B., Del Zozzo, A., Fandiño Pinilla, M.I., Iori, M., Marazzani, I., Monaco, A., Nicosia, G. G., Santi, G. (2022). *I problemi di matematica nella scuola primaria tra ricerca didattica e prassi scolastica*. Bologna: Pitagora.
04. D’Amore, B., Asenova M., Del Zozzo, A., Fandiño Pinilla, M.I., Iori M., & Santi, G. (2021). *I numeri: Matematica, storia, giochi e curiosità, per una didattica corretta ed efficace*. Bologna: Pitagora.
05. Asenova, M. *Definizione categoriale di oggetto matematico in Didattica della matematica*. Bologna: Pitagora. (Doctoral Thesis)

Chapter in book

06. Asenova, M., Del Zozzo, A., & Garzetti, M. (2024). The Semiotic perspective in teachers’ training in Mathematics Education. In M. T. Moretti (Ed.), *Florilegium de investigaciones que envuelven la teoría semiocognitiva del aprendizaje matemático de Raymond Duval (parte 3)* (pp. 196-217). Edición GPEEM/PPGECT/UFSC.

07. Asenova, M., Fandiño Pinilla, M. I. & Monaco, A. Il Curricolo Verticale di matematica. In: Cerini, G., Loiero, S. & Spinosi, M. (Eds.) (2012). *Indicazioni per il curricolo 2012*. Napoli: Tecnodid.

Conference papers

01. Asenova, M., Del Zozzo, A., & Garzetti, M. (in press). *Enhancing Teacher Training in Mathematics Education: A Model for a Semiotic Approach to Feedback and Interpretative Knowledge*. Proceedings of FAME 1-Feedback and Assessment in Mathematics Education, 5th-7th June 2024, Utrecht, The Netherlands.
02. Asenova, M., Del Zozzo, A., & Garzetti, M. (2024). Dall'Interpretative Knowledge (IK) alla Semiotic Interpretative Knowledge (SIK): l'importanza degli aspetti semiotici nel feedback agli studenti. In Raccolta degli abstract estesi dell'40° Seminario Nazionale di Ricerca in Didattica della Matematica "Giovanni Prodi", 22nd-23rd February 2024 (pp. 41-51). Rimini: AIRDM.
03. Asenova, M. (2023). An Epistemic-Logical Model for Analysis of Students' Argumentation in Mathematics Education Research. In P. Drijvers, C. Csapodi, H. Palmér, K. Gosztonyi, & E. Kónya (Eds.), *Proceedings of the Thirteenth Congress of the European Society for Research in Mathematics Education (CERME13)* (pp. 56–63). Alfréd Rényi Institute of Mathematics and ERME.
04. Asenova, M., Del Zozzo, A., & Santi, G. (2023). From Interpretative Knowledge to Semiotic Interpretative Knowledge in prospective teachers' feedback to students' solutions. In M. Ayalon, B. Koichu, R. Leikin, L. Rubel, M. Tabach (Eds.), *Proceedings of the 46th of the International Group for the Psychology of Mathematics Education (Vol. 2, pp. 51-58)*. University of Haifa and PME.
05. Asenova, M. (2023). Mathematical objects within a transitory epistemology. In E. Barbin, R. Capone, M. N. Fried, M. Menghini, H. Pinto, & F.S. Tortoriello (Eds.) *Proceedings of the 9th European Summer University of History and Epistemology in Mathematics Education* (pp. 237-242). Edizioni Nuova Cultura Roma.
06. Gaidoschik, M., & Asenova, M. (2022). La scomposizione additiva al centro dell'aritmetica all'inizio della scuola primaria: basi teoriche ed esempi d'aula. In B. D'Amore (Ed.), *Didattica della matematica come attività di ricerca in aula. Atti del XXXVI Convegno "Incontri con la matematica", Castel san Pietro Terme (Bo), 21-23 ottobre 2022* (pp. 93-94). Bologna: Pitagora.
07. Asenova, M. (2022). Questioning the exclusivity of classical logic and set-theoretic assumptions in analysis of classroom argumentation and proof.. In J. Hodgen, E. Geraniou, G. Bolondi, & F. Ferretti (Eds.), *Proceedings of the Twelfth Congress of the European Society for Research in Mathematics Education* (pp. 77-84). Free University of Bozen-Bolzano, and ERME.
08. Asenova, M. (2021). Oggetti matematici in Didattica della matematica. In B. D'Amore (Ed.), *Atti del XXXV Convegno nazionale "Incontri con la matematica", Castel San Pietro Terme (BO)* (pp. 211-212). Bologna: Pitagora.
09. Asenova, M., & Marazzani, I. (2020). Discussioni fra alunni della scuola primaria sul concetto di altezza di un poligono. In B. D'Amore & S. Sbaragli (Eds.), *Atti del XXXIV Convegno nazionale "Incontri con la matematica", Castel San Pietro Terme (BO)* (pp. 43-44). Bologna: Pitagora.
10. Asenova, M. (2019). Epistemological obstacles in the evolution of

- the concept of proof in the path of ancient Greek tradition. In U. T. Jankvist, M. Van den Heuvel-Panhuizen, M., & M. Veldhuis (Eds.), *Proceedings of CERME11, February 6 - 10, 2019*. Utrecht, the Netherlands: Utrecht University and ERME, Freudenthal Group & Freudenthal Institute. Available at: http://www.mathematik.uni-dortmund.de/~prediger/ERME/CERME11_Proceedings_2019.pdf
11. Asenova, M. & Polidoro, S. (2018). L'equazione di Laplace: Una prospettiva storico-epistemologica. *Atti del XXXII Convegno nazionale "Incontri con la matematica", Castel San Pietro Terme (BO)* (pp. 139-140). Bologna: Pitagora.
 12. Asenova, M. (2016). Ragionamento deduttivo e modello deduttivo nyaya. In: Iori M. (Ed.). *La matematica e la sua Didattica. Mathematics and Mathematics Education*. Proceedings of the International Conference in occasion of the 70 yeras of Bruno D'Amore, Bologna, October 8, 2017 (pp. 61-65). Bologna: Pitagora.
 13. Asenova, M. (2015). Aspetti sintattici e semantici delle costruzioni geometriche alla scuola primaria. In: D'Amore B., Sbaragli S. (Eds.). *La didattica della matematica disciplina per l'apprendimento*. Atti del Convegno "Incontri con la matematica", n. 29, Castel San Pietro Terme (BO). (pp. 99-100). Bologna: Pitagora.
 14. Asenova, M. & Bolondi, G. (2015). A hermeneutic approach in mathematics education: the case of probability. In: Barbin, E., Jankvist, U.T. & Kjeldsen, T.H. (Eds.). *History and Epistemology in Mathematics Education*. Proceedings of the Seventh European Summer University, Copenhagen, Denmark, 14-18 July 2015. Copenhagen: Danish school of education, Aarhus University. Available at: https://conferences.au.dk/fileadmin/conferences/ESU-7/ESU7_e-version-red.pdf.
 15. Asenova, M. (2013). Il ruolo delle rappresentazioni visive nell'apprendimento della matematica. In: D'Amore, B. & Sbaragli, S. (Eds.). *La didattica della matematica come chiave di lettura delle situazioni d'aula*. Atti del Convegno "Incontri con la matematica", n. 27, Castel San Pietro Terme (BO) (pp. 141-142). Bologna: Pitagora.
 16. Asenova, M. (2011). Linguaggio e didattica della matematica: una parafrasi algebrica e le sue implicazioni didattiche. In: D'Amore, B. & Sbaragli, S. (Eds.). *Un quarto di secolo al servizio della didattica della matematica*. Atti del Convegno "Incontri con la matematica", n. 25, Castel San Pietro Terme (BO) (pp.143-144). Bologna: Pitagora.

Journal articles in refereed academic journals

01. Asenova, M. (2024). Bridging the Gap: An Epistemic Logical Model for Analysing Students' Argumentation and Proof in Mathematics Education Research. *Education Sciences*, 4(6), 673. DOI: 10.3390/educsci14060673
02. Gelmi, A., Garzetti, M., & Asenova, M. (2024). Creativity in mathematical learning: A model to explain the cognitive functioning of creative processes and provide general design requirements. *La matematica e la sua didattica*, 32(1), 1-99.
03. Asenova, M. (2023). Is theoretical topic-specific research "old fashioned"? An epistemological inquiry about the ontological creativity of Mathematics Education Research. *Mathematics Education Research Journal*. <https://doi.org/10.1007/s13394-023-00471-z>
04. Asenova, M., Del Zozzo, A., & Santi, G. (2023). Unfolding Teachers' Interpretative Knowledge into Semiotic Interpretative Knowledge to Understand and Improve Mathematical Learning in an Inclusive Perspective. *Education Sciences*, 13(1), 65. <https://doi.org/10.3390/educsci13010065>

05. Asenova, M., Bagossi, S., & Arzarello, F. (2023). Una definizione categoriale di covariazione al secondo ordine. Aspetti epistemologici e didattici. *CEMeR*, 13(2), 11-32.
06. Asenova, M. (2022). Non-classical approaches to logic and quantification as a means for analysis of classroom argumentation and proof in mathematics education research. *Acta Scientiae*, 24(5), pp. 404–428. <https://doi.org/10.17648/acta.scientiae.7405>
07. Asenova, M., D'Amore, B., Fandiño Pinilla, M. I., Iori, M., & Santi, G. (2020). Parole sconosciute non matematicamente rilevanti: influenzano davvero la risoluzione di un problema? *La matematica e la sua didattica*, 28(2), 191-253.
08. Asenova, M., D'Amore, B., Fandiño Pinilla, M. I., Iori, M., & Santi, G. (2020). Análisis de algunos aspectos de la teoría de la objetivación. *RECME-Revista Colombiana de Matemática Educativa*, 5(2), 33-50.
09. Asenova M., D'Amore B., Fandiño Pinilla, M.I., Iori M. e Santi G. (2020). La teoria dell'oggettivazione e la teoria delle situazioni didattiche: Un esempio di confronto tra teorie in didattica della matematica. *La matematica e la sua didattica*, 28(1), 7-61.
10. Asenova, M. (2018). Vedere geometricamente: La percezione non iconica alla scuola primaria. *La matematica e la sua didattica*, 26(2), 173-210.
11. Asenova, M. & Polidoro, S. (2018). L'equazione di Laplace: Una riflessione storico-epistemologica. *La matematica e la sua didattica*, 26(2), 153-171.

Journal articles in professional journals

01. Asenova, M. (2020). La filosofia della matematica elimini tutti i dogmi. Intervista a Fernando Zalamea. *Prisma*, 22(9), 62–65. (Interview with Fernando Zalamea).

Further data

Other Publications in Mathematics Education

01. Asenova, M. (2012). *Avanti tutta! (cl.2). Libro - quaderno di matematica per le scuole secondarie di primo grado*. Firenze: Giunti T.V.P.
02. Asenova, M. (2012). *Avanti tutta! (cl.1). Libro - quaderno di matematica per le scuole secondarie di primo grado*. Firenze: Giunti T.V.P.
03. Asenova, M. (2011). Prodotti notevoli e scomposizioni. Una parafrasi algebrica e le sue implicazioni didattiche. In: Sbaragli, S. (Ed.). *Buone pratiche d'aula in Matematica. Percorsi didattici in continuità tra scuola dell'infanzia e secondaria di secondo grado* (pp. 181-188). Bologna: Pitagora.
04. Asenova, M., Foresti, I., Grassi, G., Iori, M., Sangiorgi, M. C. & Sbaragli, S. (2011). *Prove nazionali di matematica: prepariamoci alle prove INVALSI. Test per la classe terza della scuola secondaria di primo grado*. Firenze: Giunti Scuola.

Book reviews

01. D'Amore, B. (2021). Memorie di una vita: i personaggi, le storie, le idee. Bologna.Pitagora. [Review published in *La matematica e la sua didattica*, 30(1-2), 77-79. (with Maura Iori e George Santi)]
02. Lolli, G. (2018). Matematica come narrazione: Raccontare la matematica. Bologna: il Mulino. Bologna: il Mulino. [Review

published in *La matematica e la sua didattica*, 26(2), 311-316.
(with Bruno D'Amore)]

03. Raymond Duval (2017). *Understanding the mathematical way of thinking: The registers of semiotic representations*. Prefazione di Bruno D'Amore. Cham: Springer International Publishing. [Review published in *La matematica e la sua didattica*, 26(1), 120-124.]
04. Bruno Jannamorelli (2017). *Strumenti di calcolo ingenui ... ma ingegnosi e multiculturali*. Bologna: Pitagora. *La matematica e la sua didattica*, 26(1), 116-117. [Review published in *La matematica e la sua didattica*, 26(1), 116-117.]

Statement of interest

I am particularly interested in research in Mathematics Education and my aim is to be able to combine my research interests with the teaching activity at academic level, where research can involve not only young children, but also prospective and in-service teachers. My research interests are related to: semiotic aspects and feedback in teacher training; epistemology and the theoretical foundations of Mathematics Education Research; relation between mathematical objects in Mathematics and in Mathematics Education Research; logic, argumentation and proof in Mathematics Education Research.

Language competence

- Bulgarian: advanced (mother tongue)
- German: advanced (C1)
- Italian: advanced (C1)
- English: intermediate (B2)
- Russian (basic)
- French (basic)

Brixen, August 6th, 2024