

Italo Testa Curriculum Vitae – Short Form

Education

1997: Degree in Physics

2008: Phd in Physics Education

Professional Activity

Since 2016: coordinator of the Physics Department “E. Pancini”, University of Naples “Federico II”, for the National Project “Piano Nazionale Lauree Scientifiche” (PNLS)

Since 2006: Assistant professor at the Physics Department “E. Pancini”, University of Naples “Federico II”

2003-2006: Secondary School teacher in Electronics and Telecommunication

1998-2003: Fellowship owner in Physics Education, University of Naples “Federico II”

Research Interests

Role of visual representations and spatial reasoning in physics and astronomy education

Developing research-based teaching-learning sequences in astronomy and quantum mechanics

Diagnosing students’ abilities and metacognitive skills in physics

Physics teachers’ professional development

Current projects

Mathematics in Vocational Education (Numeracy and Literacy)

Piano Nazionale Lauree Scientifiche (PNLS)

Biography

Since 1999 I have worked full-time in research in physics education. My research interests for nearly a decade focused on the: - analysis of visual representations (graphs, pictures, simulations) for the teaching of physics in upper secondary schools; - role of models and modeling to describe and interpret natural and technological phenomena and processes and their relationship with aspects of the epistemology of Science; - conceptual understanding in learning electrical circuits; - role of physics in scientific literacy and in student decision-making processes regarding socio-scientific issues. During the latter ten years, I expanded my research interest towards the role of spatial thinking in astronomy education and the learning difficulties about basic astronomical phenomena and stars. These studies led to the development of teaching learning sequences and learning progressions about seasons, eclipses, moon phases and stars structure and evolution. More recently, I investigated the role of confutational images and combined effects of laboratory and images on students’ understanding in astronomy. All these studies were carried out in collaboration with researchers at the Capodimonte Astronomical Observatory of Naples. In parallel, I applied a quantitative approach based on Rasch analysis to describe how students learn basics concepts in quantum mechanics. Research results have been implemented in several professional development courses for pre-service and in-service secondary school science and physics teachers.

As researcher I have been actively involved in several collaborative research projects at international level:

- 2013-2015, CHAIN REACTION: A sustainable programme for Inquiry Based Science Education. Research units included: Centre for Science Education, Sheffield Hallam University (Coordinator), UK; Department of Physics, Naples University Federico II, Italy; Faculty of Natural Sciences, Matej

Bel University Banska Bystrica, Slovakia; Education Department, TED Universitesi, Ankara, Turkey; Department of Physics, Plovdiv University, Bulgaria; Centre International de Formation Pédagogique, France, University Ljubljana, Slovenia; Heidelberg University of Education, Germany; Department of Chemistry, University of Crete, Greece; Department of Education and Professional Studies, University of Limerick, Ireland; Jordan Society Of Scientific Research, Amman, Jordan; Ilia State University, Tbilisi, Georgia)

- 2007-2009, MATERIALS SCIENCE (University-school partnerships for the design and implementation of research-based ICT-enhanced modules on Material Properties. Research units included: University of Cyprus, University "Federico II" of Napoli, Aristotle University of Thessaloniki, University of Helsinki, University Autònoma de Barcelona, University of Western Macedonia)
- 2003-2005, STTAE (Science Teacher Training Across Europe. Research units: University Of Athens, Pedagogical Institute Of The Greek Ministry Of Education, Ellinogermaniki Agogi, University Of Education Ludwigsburg, University Of Claude Bernard Lyon 1, University Of Babes-Bolyai, University Of Napoli, University Of Palermo, University Of Louvain)
- 1999-2001, STTIS (Science Teacher Training in an Information Society. Research Units: Université Denis Diderot, Paris V, University "Federico II", Napoli, University of Oslo, Universitat Autònoma de Barcelona, University of Sussex Institute of Education, coord. Roser Pintò)

Currently, I am teaching at the University of Naples the course of Quantitative methods in physics Education and the course of Preparation of Teaching – Learning Sequences in Physics Education for Math and Physics undergraduates.

Selected Publications

1. Marzoli, I., Colantonio, A., Fazio, C., Giliberti, M., Scotti di Uccio, U., & Testa I. (2021) Effects of emergency remote instruction during the COVID-19 pandemic on university physics students in Italy. *Phys. Rev. Phys. Educ. Res.* (In press)
2. Freda, M.F., De Luca Picione R., Esposito, G., Ragozini G., & Testa I. (2021) A new measure for the assessment of the university engagement: The SInAPSi academic engagement scale (SAES). *Current Psychology*. DOI: /10.1007/s12144-021-02189-2
3. Colantonio, A., Marzoli, I., Puddu, E., Bardelli, S., Fulco, M.T., Galano, S., Terranegra, L., Testa, I. (2021) Describing astronomy identity of upper primary and middle school students through structural equation modeling. *Phys. Rev. Phys. Educ. Res.* 17, 010139
4. Testa, I., De Luca Picione, R., Scotti di Uccio, U. (2021) Patterns of Italian high school and university students' attitudes towards physics: an analysis based on semiotic-cultural perspective. *European Journal of Psychology of Education*, <https://doi.org/10.1007/s10212-021-00563-z>
5. Testa I., D. Psillos, & A. Molochidis (2020) How national curricula affect the design and transfer of a teaching-learning sequence between two educational systems: Case studies from Greece and Italy. *Phys. Rev. Phys. Educ. Res.* 16, 020146
6. Testa I., Colantonio A., Galano S., Marzoli I., Trani F., & Scotti di Uccio U. (2020) Effects of instruction on students' overconfidence in introductory quantum mechanics. *Phys. Rev. Phys. Educ. Res.* 16, 010143
7. Scotti di Uccio U., Colantonio A., Galano S., Marzoli I., Trani F., & Testa I. (2020) Development of a construct map to describe students' reasoning about introductory quantum mechanics. *Phys. Rev. Phys. Educ. Res.* 16, 010144
8. Galano S., Monti F., Bozzo G., Daffara C., & Testa I. (2020) Investigating the Interplay of Practical Work and Visual Representations on Students' Misconceptions: The Case of Seasons. In J. Guisasola and K. Zuza (eds.), *Research and Innovation in Physics Education: Two Sides of the Same Coin, Challenges in Physics Education*, pp. 183 – 195. Springer Nature Switzerland

9. Testa I, Galano S., Colantonio A., Capasso G., Scotti di Uccio U., Serroni G., Marzoli I. (2020) Validation of University Entrance Tests through Rasch Analysis. In Myint Swe Khine (ed.) *Rasch Measurement - Applications in Quantitative Educational Research*, pp. 99-124. Singapore: Springer Education
10. Scotti di Uccio U., Colantonio A., Galano S., Marzoli I., Trani F., & Testa I. (2019) Design and validation of a two-tier questionnaire on basic aspects in quantum mechanics. *Phys. Rev. Phys. Educ. Res.* 15, 010137
11. Testa I., Capasso G., Colantonio A., Galano S., Marzoli I., Scotti di Uccio U., Trani F. & Zappia A. (2019) Development and validation of a university students' progression in learning quantum mechanics through exploratory factor analysis and Rasch analysis, *International Journal of Science Education*, 41, 3, 388-41
12. Galano S., Colantonio A., Leccia S., Puddu E., Marzoli I., Testa I. (2019) A teaching-learning module on stellar structure and evolution. In: Deustua, S; Eastwood, K; TenKate, I. (eds) *International Symposium On Education In Astronomy And Astrobiology (ISE2A 2017)*. UNSP 01017. Utrecht: EPJ Web of Conferences
13. Colantonio A., Galano S., Leccia S., Puddu E., Testa I. (2018) Design and development of a learning progression about stellar structure and evolution. *Phys. Rev. Phys. Educ. Res.* 14, 010143
14. Galano S., Colantonio A., Leccia S., Marzoli I., Puddu E., Testa I. (2018) Developing the use of visual representations to explain basic astronomy phenomena. *Phys. Rev. Phys. Educ. Res.* 14, 010145
15. Colantonio A., Galano S., Leccia S., Puddu E., Testa I. (2017) A teaching module about stellar structure and evolution. *Physics Education*, 52, 1, 015012
16. A. Zappia, G. Capasso, S. Galano, I. Marzoli, L. Smaldone, I. Testa (2017) Investigating Science Teachers' Transformations of Inquiry Aspects When Implementing Research-Based Teaching-Learning Sequences. In K. Hahl, K. Juuti, J. Lampiselkä, J. Lavonen & A. Uitto (eds.), *Cognitive and Affective Aspects in Science Education*, pp. 279-293. Dordrecht: Springer
17. Poggi V, Miceli C., Testa I. (2017) Teaching energy using an integrated science approach. *Physics Education*, 52, 1, 015018
18. I. Testa, A. Colantonio, S. Galano, S. Leccia, E. Puddu (2016) Students' Difficulties in Interpreting Images and Simulations about Astronomy Phenomena. In L.-J. Thoms & R. Girwidz, *Electronic Proceedings of the 20th International Conference on Multimedia in Physics Teaching and Learning*, pp. 39-46. Ludwig-Maximilians-Universität München, Chair of Physics Education, Germany, European Physical Society. ISBN 978-2-914771-94-8
19. Leccia S., Colantonio A., Puddu E., Galano S., Testa I. (2015) Teaching about mechanical waves and sound with a tuning fork and the Sun. *Physics Education*, 50, 6, 677-68
20. Testa I., Galano S., Leccia S., Puddu E. (2015) Development and validation of a learning progression for change of seasons, solar and lunar eclipses, and moon phases. *Phys. Rev. ST Phys. Educ. Res.*, 11, 020 102
21. Testa I., Busarello G., Puddu E., Leccia S., Merluzzi P., Colantonio A., Moretti M. I., Galano S., Zappia A. (2015) Quantitative experiments to explain the change of Seasons. *Physics Education*, 50, 2, 179-188
22. Testa I., Leccia S., Puddu E. (2014) Astronomy textbooks images: do they really help students? *Physics Education*, 49, 3, 332-343
23. Danusso L., Testa I., Vicentini M. (2010) Improving Prospective Teachers Knowledge About Scientific Models and Modelling: Design and Evaluation of a Teacher Education Intervention. *International Journal of Science Education*, 32, 7, 871 — 905
24. Sassi E., Monroy G., Testa I. (2005). Teacher Training about Real-Time Approaches: research-based guidelines and materials. *Science Education*, 89, 1, 28 – 37.
25. Testa I., Monroy G. and Sassi E. (2002). Students' Reading Images in Kinematics: The Case of Real-Time Graphs. *Int. J. of Science Education*, 24, 3, 235 – 256

