



6th International Conference

**Higher Education Learning
Methodologies and Technologies
Online**

25-27 September 2024, Rome, Italy

Book of Abstracts

Sponsored by



Società Italiana di Ricerca sull'Educazione Mediale



Autori vari
HELMeTO 2024 - Book of
Abstracts Tutti i diritti sono riservati

Editore STUDIUM s.r.l. a socio unico
Prima edizione Settembre 2024

ISBN 978-88-99978-67-9

Questa opera è protetta dalla legge n. 633/1941 sul diritto d'autore
© STUDIUM s.r.l. a socio unico 2024

Table of Contents

General Track 1 - Online pedagogy and learning methodologies

Exploring New Avenues in Formative Assessment for School Teachers: An Engaging, Computer-Based, and Situated Design.....	2
<i>Federica Morleo, Pasquale Anselmi and Alessandra Vitanza</i>	
Universities as strategic hubs for teachers' training: a professional development model proposal	5
<i>Arianna Giuliani, Elisa Mazzella and Serena Triacca</i>	
Assessment Design Using the MOODLE Learning Platform.....	8
<i>Olha Hulai, Vasylyna Shemet and Iryna Moroz</i>	
Online teacher training to implement skills-based teaching.....	11
<i>Emmanuele Gatti and Marco Rondonotti</i>	
Teaching Vision Inspection in Industrial Engineering: a constructively aligned online educational unit design.....	14
<i>Francesco Lupi, Antonio Maffei and Michele Lanzetta</i>	
Integrating Collaborative Video-Based Learning for Transdisciplinary Case Work in Pedagogical and Health-Related Education.....	17
<i>André Helgert, Nadine Elstrodt-Wefing, Michéle Möhring and Carolin Straßmann</i>	
Are you a left or right-brain type? Persistence of neuromyths in Italian in-service teachers	20
<i>Andrea Tinterri, Maria Carolina Zarrilli Affaitati, Angelo Basta and Anna Dipace</i>	
Thoughtful thoughts before developing distance learning in medical education	23
<i>Patrik Kjærdsdam Telléus, Piergiorgio Guarani and Raffaele Di Fuccio</i>	
Student-teachers' assessment competences in higher education. Documental analysis of Moodle's tools	26
<i>Laura Sara Agrati and Arianna Beri</i>	

General Track 2: Learning technologies, data analytics and educational big data mining

Enhancing Reflective Practices in Pre-Service Educators: A Case Study on the Role of GenAI in Assessment as Learning	30
<i>Leonard Busuttil</i>	
Engagement Habits: Visualisation of Longitudinal Learner Analytics with Frequency Heatmaps.....	33
<i>Martin Ruskov</i>	
Comparing the outcomes of students and ChatGPT in distance learning courses about Computer and Network Security	36
<i>Francesco Denaro, Pietro Ducange, Riccardo Pecori, Giuseppe Tradigo and Luca Veltri</i>	
Pathways to guidance through sustainability: a case study.....	39
<i>Michela Bongiorno, Barbara Bruschi and Davide Taibi</i>	

Machine Learning Stacked Classifiers Role in Higher Education Student Retention and Academic Success	42
<i>Muhammad Amin Nadim and Emanuele Marsico</i>	
Setting the Stage for Innovation: Developing the Study Framework for the enhancement of the CONALI Ontology in Education	45
<i>Antonio Maffei, Dario Lombardi, Francesco Lupi, Luigi Traetta and Michele Lanzetta</i>	
An Entropy-based Federated Learning approach for the student's dropout prediction	48
<i>Mario Luca Bernardi, Marta Cimitile and Muhammad Usman</i>	

SPECIAL TRACK 1: Inclusion and immersive approaches for higher education

I'm in Tales MOOC on Tangible User Interfaces and the UDL Model: A Case Study Design	52
<i>Silvio Pagliara, Lorenzo Desideri, Katerina Mavrou, Erika Inderst, Raffaele Di Fuccio, Maria Mouka, Giulia Mignardi, Riccardo Magni, Chrystalla Papademetri, Marianna Efstathiadou, Inge Piedfort, Vilma Ferrari and Silvia Mazzoni</i>	
'Touching' Stories: Towards the Development of Tangible User Interfaces Story-Building Authoring Tool for Inclusive Education	55
<i>Silvio Pagliara, Lorenzo Desideri, Katerina Mavrou, Erika Inderst, Raffaele Di Fuccio, Maria Mouka, Giulia Mignardi, Riccardo Magni, Chrystalla Papademetri, Marianna Efstathiadou, Inge Piedfort, Vilma Ferrari and Silvia Mazzoni</i>	
Students with Special Needs at University: E-learning as a contribute to inclusion	58
<i>Venusia Covelli, Laura Panizza, Miriam Trezzi, Elisa Zugno and Alessandra Marelli</i>	
Fortnite Creative: A Platform for Video Game Usability Research	61
<i>Marco Cremaschi, Elia Guarnieri and David Chieregato</i>	
Playing and learning in the blink of an eye: integrating eye-tracking technologies into game-based special needs education	64
<i>Nadia Di Leo, Martina Rossi, Anna Teresa Musicco and Giusi Antonia Toto</i>	
Extended Educational Environments for Past, Present and Future Students of Design & Computation	67
<i>Christian Schmidts, Johannes Pointner and Daniel Devatman Hromada</i>	
Does using ChatGpt for educational purposes require information on students' learning styles? An exploratory study conducted with learning tutors for students with special educational needs	70
<i>Angelo Rega, Raffaele Di Fuccio, Grazia De Angelis and Carolina Mele</i>	

SPECIAL TRACK 2: Artificial Intelligence and Innovative Technology for Special Education

Applying artificial intelligence to virtual reality to support Special Educational Needs	74
<i>Maria Concetta Carruba and Mario Covarrubias</i>	

Integration of Artificial Intelligence and Design Thinking in Education 4.0-7.0 from a Philological Perspective	77
<i>Oksana Danylchenko-Cherniak, Michele Russo and Michael Radin</i>	
The role of AR, VR, and AI for students with motor and communication disabilities: a literature review	80
<i>Fabrizio Corradi, Cristiana Cardinali and Maria Cinque</i>	
Business Schools and teaching practices: an online survey	83
<i>Maria Clara Dicataldo and Anna Dipace</i>	
Digital transformation of Initial Teacher Training: an exploratory study on eTwinning experimentation	86
<i>Viviana Vinci</i>	

SPECIAL TRACK 3: Learning Technologies and Faculty Development in the digital framework

Faculty Development in the online university setting: academic staff perceptions	90
<i>Paolo Raviolo, Marco Rondonotti and Serena Triacca</i>	
A.T.E.N.A. : Augmented Tools for Enhancement of Neural Activation. 3D Models in Didactics for Qualitative and Quantitative Learning	93
<i>Elèna Cipollone, Luna Lembo and Francesco Peluso Cassese</i>	
A systematic review of Faculty Development and digital technologies in Higher Education	96
<i>Federica Emanuel, Laura Fedeli and Alessia Scarinci</i>	
The impact of online teaching and the perception of digital skills among secondary school teachers	99
<i>Michele Marangi and Irene Mauro</i>	
Technologies can support learning in Higher Education: teachers' practices and perceptions	102
<i>Elisabetta Nicchia, Davide Parmigiani and Emiliana Murgia</i>	
Evaluation and impact of the Artificial Intelligence transversal skills Course: student feedback and progress in Faculty Development	105
<i>Loredana Perla, Annamaria Di Grassi, Raffaella Forliano and Maria Teresa Santacroce</i>	
MOOC Courses as an Element of Blended Learning	108
<i>Olha Hulai, Vitalii Kabak and Pavlo Savaryn</i>	
Museum education and new technologies for innovative teaching: impacts on teacher training	111
<i>Valentina Berardinetti, Guendalina Peconio, Martina Rossi and Giusi Antonia Toto</i>	
Empowering Future Teachers: The Role of Active Breaks and Technologies in Initial Teacher Training	114
<i>Elif Gulbay, Alessandra La Marca, Giorgia Rita De Franches and Savannah Olivia Mercer</i>	

Developing a questionnaire for measuring future teacher anxiety: with insights from initial observations and interviews	117
<i>Savannah Olivia Mercer, Ylenia Falzone, Alessandra La Marca, Benedetta Miro, Giorgia Rita De Franches and Mariagemma Pecoraro</i>	
LookAIHed: a comprehensive Faculty Development approach to integrate AI in Higher Education	120
<i>Juliana Elisa Raffaghelli, Mariana Ferrarelli and Marina de Rossi</i>	
Teaching and Learning Center and development of teacher professionalism: the case of an Italian university	122
<i>Ida Verna and Elia Pizzolitto</i>	

SPECIAL TRACK 4: Critical pedagogy, art, affect as method and performativity in Online Higher Education

AI and personalization of Mindfulness in higher education: emotions at stake for the reaching of well-being	126
<i>Nadia Carlomagno, Valeria Vadalá and Maria Vittoria Battaglia</i>	
Chances for accessibility: a case study on media education and contemporary art	129
<i>Eleonora Minna and Giulia Rocchi</i>	
Aesthetic experience as class engagement: a study on the intersection between emotions and art in e-learning	132
<i>Fabrizio Barpi, Ambrogia Cereda, Antonella De Blasio and Fiorella Vinci</i>	
I AM – I DO – I DREAM: Relational Dynamics in Self-Perception through Artistic Research	135
<i>Nadia Carlomagno, Arianna Ricciardi and Francesca Iandolo</i>	
Reading Dewey: Art and Democracy in an Academic Online Environment	138
<i>Fiorella Vinci</i>	
Models and Practices for Inclusion: Artificial Intelligence and Heritage Education	141
<i>Francesca Marone, Francescs Buccini and Ilaria Curci</i>	

SPECIAL TRACK 5: Intelligent tutoring systems and conversational pedagogical agents in higher education

Instructional Design and Disability: Empowering Inclusive Education with CONALI & AI	145
<i>Dario Lombardi, Luigi Traetta, Fan Mo and Antonio Maffei</i>	
“AI as an Ally?” : supporting argumentative skills in undergraduate students	148
<i>Francesca Crudele and Juliana Elisa Raffaghelli</i>	
Pedagogical Agents for Supportive Learning Instruction	151
<i>Darina Izhboldina</i>	
AI-Powered Chatbot: Teaching Assistant for Course Organization	154
<i>Leonardo Boncinelli, Alessio Magnolfi and Eugenio Vicario</i>	

SPECIAL TRACK 6: Rethink Education: The Opportunities and Challenges of Artificial Intelligence

Educational Architecture of Artificial Systems	158
<i>Flavia Santoianni and Alessandro Ciasullo</i>	
Explaining stress level predictions in higher education students through machine learning algorithms	161
<i>Gabriella Casalino, Giovanna Castellano, Fabiana Fornaro and Gianluca Zaza</i>	
Enhancing Higher Education with AI: Balancing Personalized Learning and Ethical Responsibility	164
<i>Pasquale Ardimento and Michele Scalera</i>	
Generative AI in Higher Education: two case studies	167
<i>Davide Taibi and Giovanni Fulantelli</i>	
Approaches for Integrating AI activities in Computer Science courses	170
<i>Gaetano Anastasi and Paolo Musmarra</i>	
Generative AI in Higher Education - Perspectives from Students and Teaching Staff	173
<i>Lukas Erle, Thomas Hoss, Isabel Peltzer and Sabrina C. Eimler</i>	
Does time matter in learning analytics?	176
<i>Gabriella Casalino, Giovanna Castellano and Gianluca Zaza</i>	
Beyond Problem-Solving: Using ChatGPT to Foster Deep Learning and Engagement Among Pre-University Students*	179
<i>Daniele Schicchi and Davide Taibi</i>	
Combining Large Language Models and Linked Open Data for Authoring of Learning Task	182
<i>Pablo García-Zarza, Davide Taibi, Juan I. Asensio-Pérez, Miguel L. Bote-Lorenzo and Guillermo Vega-Gorgojo</i>	
Formative Assessment Supported by Artificial Agents	185
<i>Pier Giuseppe Rossi, Lorella Giannandrea, Chiara Laici, David Scaradozzi, Francesca Gratani and Laura Screpanti</i>	
Stress in the university population: the positive role of physical activity in improving the wellbeing of students	188
<i>Mariasole Guerriero, Marilena di Padova, Fiorenzo Moscatelli, Sergio Bellantonio, Anna Dipace and Angelo Basta</i>	
Enhancing STEM Education with an AI-powered System that Promotes Interactive Learning and Engagement	191
<i>Marei Beukman, Björn Rudzewitz, Daniela Verratti Souto, Mingjing Zhu and Xiaobin Chen</i>	
Enhancing language assessment with AI and intelligent technologies: an Intelligent Language Assessment Platform	194
<i>Sarah Löber, Björn Rudzewitz, Daniela Verratti Souto, Luisa Ribeiro-Flucht and Xiaobin Chen</i>	

Flipped Learning and AI in Initial Teachers Training	197
<i>Ylenia Falzone, Antonella Leone, Vanessa Pitrella, Leonarda Longo and Dorotea Rita Di Carlo</i>	
Can Thinking Strategies Improve Understanding of Machine Learning?	200
<i>Matteo Baldoni, Cristina Baroglio, Monica Bucciarelli, Sara Capecchi, Leonardo Castellani, Elena Gandolfi, Francesco Iani, Elisa Marengo and Roberto Micalizio</i>	
Virtual worlds and intelligent tutoring systems for learning motivation: a narrative review	203
<i>Alfonso Filippone, Umberto Barbieri, Emanuele Marsico, Muhammad Amin Nadim and Raffaele Di Fuccio</i>	
Public Speaking Skills and Anxiety Awareness in Future Teachers. Using AI and IoT in Higher Education for research and training	207
<i>Lorella Giannandrea, Lorenza Maria Capolla, Francesca Gratani, Giacomo Nalli and Stylianos Kapetanakis</i>	
Bridging the AI Literacy Gap: Future Educators' Perspectives on AI Integration in Education	210
<i>Maria Ranieri, Gabriele Biagini and Stefano Cuomo</i>	
AI Act: a text analysis	213
<i>Delio De Martino, Marilena di Padova, Maria Clara Dicaldo and Anna Dipace</i>	
Gen-AI Systems in Context: Ethical Understandings and Model Cards	216
<i>Shannon Bramwell, Lesley Wilton, Rutwa Engineer, Stephen Ip and Athena Tassis</i>	
Enhancing Teacher Literacy in AI through the PROSPETTIVA Project	219
<i>Daniele Schicchi and Davide Taibi</i>	
Effective AI in Education: Transitioning from Sensor-Based to Interaction-Based Models in JOINclusion case study	222
<i>Enrique Hortal, Annaleda Mazzucato and John Christidis</i>	
Beyond Coding with AI: an Educational Intervention and a Research Methodology for CS Education	225
<i>Giulia Paludo, Agnese Del Zozzo, Francesca Fiore and Alberto Montresor</i>	

SPECIAL TRACK 7: Laboratory teaching and experiential learning in digital environments

Promoting undergraduate mathematics students' TPACK knowledge through digital resource productions	229
<i>Annamaria Miranda and Loredana Saliceto</i>	
Augmented and Virtual Realities: prospective teachers knowledge, intentions and believes about their use in geometry teaching design	232
<i>Benedetto Di Paola, Lorenza Cutrera and Claudio Fazio</i>	
Foggia Occupator: a case study on the creation of an Open Educational Resource through the digitization of a historical newspaper	235
<i>Michele Ciletti, Marco di Furia, Piergiorgio Guarini and Giusi Antonia Toto</i>	

Educational relationship educator-children-robots: a study within the practicum for future educators	238
<i>Loredana Perla, Laura Sara Agrati and Ilenia Amati</i>	
Principles, teaching strategies and communication styles of educating young people for the world of work: audio-visual as a support tool for university teaching.....	241
<i>Serena Gianfaldoni and Pietro Balestri</i>	

Special Track 6

Rethink Education: The Opportunities and Challenges of Artificial Intelligence

Organizers:

Gabriella Casalino, University of Bari Aldo Moro, Italy

Carla Limongelli, Roma Tre University, Italy

Giosué Lo Bosco, University of Palermo, Italy

Daniele Schicchi, National Research Council of Italy, Italy

Davide Taibi, National Research Council of Italy, Italy

Formative Assessment Supported by Artificial Agents

Pier Giuseppe Rossi¹[0000-0001-9801-6307], Lorella Giannandrea¹[0000-0002-1169-4795],
Chiara Laici¹ [0000-0002-8013-1179], David Scaradozzi²[0000-0001-9346-2113],
Francesca Gratani¹[0000-0003-2974-0101] and Laura Screpanti¹[0000-0003-4765-8427]

¹ Department of Education, Cultural Heritage and Tourism,
University of Macerata MC 62100, Italy

² Department of Information Engineering,
Università Politecnica delle Marche AN 60131, Italy

piergiuosepperossi@unimc.it; lorella.giannandrea@unimc.it;
chiara.laici@unimc.it; d.scaradozzi@univpm.it;
f.gratani@unimc.it; l.screpanti@staff.univpm.it.

1 Introduction

Recent scholarly investigations have highlighted the critical importance of feedback in enhancing educational outcomes [1; 2; 3; 4]. Feedback empowers students' autonomy in the learning process, enables informed institutional decision-making, ensures continuous improvement, fosters engagement and motivation, and enables personalized learning experiences [5; 6; 7]. Nevertheless, despite its acknowledged importance, the practical implementation of feedback processes in everyday teaching is often hampered by large class sizes and time constraints. Recent technological advancements have led to the development of diverse computer tutoring systems designed to support the feedback process across various educational domains and tasks [8; 9]. These systems, characterized by their distinctive designs, have emerged as valuable tools in addressing feedback implementation challenges. Notably, plenty of tools investigate multiple-choice questions and relatively few on open-ended questions [8], thus leaving room for improvement. In order to meet this challenge, the didactic research group from the Department of Education, Cultural Heritage and Tourism at University of Macerata, initiated an investigation exploring the use of Artificial Agents in the evaluation of open texts [9; 10; 11; 12]. This research is carried out under the PRIN AI&F “*Artificial Intelligence and Feedback for Effective Learning*” project, in collaboration with teams from the Universities of Bari and Padua. This paper presents an experimental work, conducted in the academic year 2023/24, which involved 264 students attending the first year of the Master's Degree course in Primary Education.

2 Methods

The research aims to construct a recursive pathway between human and artificial agent that allows the analysis of short open-ended responses, making the process more sustainable and favoring a formative evaluation using generative feedback.

The process consists of several steps:

1. The teacher prepares the tasks (open ended questions) and, at the same time, the rubric and one or more target texts in order to train the system with possible answers.
2. The tasks, together with the rubric, are assigned to the students who will answer the questions.
3. The LLM-based system operates on both target texts and student responses. In both cases, the texts are segmented (*tokenization*) and each segment is transformed into a vector (*embedding*). The system then compares each text vector with the target text vectors and, based on their similarity, ranks the answers.
4. The teacher examines the classification made by the artificial agent, focusing on the border areas between the classes and identifies new target texts from the students' answers in order to refine the classification.
5. The artificial agent re-classifies the answers after being trained with the new target texts. It also indicates the scores where the margin of uncertainty is greatest.
6. The teacher examines the new classifications and can either accept them or propose new target texts with which the system repeats the previous cycle (steps 5-6).
7. The teacher analyzes the answers given by the system and, if the new classification appears acceptable, ends the recursive process between human agent and artificial agent. If not, a new cycle begins.
8. Once the recursive process ended, answers are sent to the students, together with an indication of the parts of each answer which deserves further attention.
9. The students, having received timely feedback on the different parts of their work, with an indication of the answer's strengths and weaknesses, can start the feedback cycle with the teacher if they have any doubts.

The process is therefore characterized by three phases: 1) the preparation of the task by the teacher and the execution of the task; 2) the recursive cycle between human and artificial agent to arrive at a classification of the papers; 3) the interaction between teacher and students in which the classifications are discussed.

3 Conclusions

The research is still ongoing, but, at the moment, three points seem to require special attention: 1) The selection of the LLM to be used by artificial agent for the incorporation and classification of the answers. For instance, using an LLM specifically trained on the Italian language, ensures that the model can handle the unique aspects of the language, leading to more accurate results. 2) The preparation of the target texts to train the artificial agent on meaningful examples of texts. These should avoid generic and ambiguous sentences. The training of the system using a large number of texts from the reference literature have been tried and tested for some time. In our case, in correcting short open-ended responses, we obtained better results by using target texts specially prepared by the teacher. 3) The definition of procedures to obtain a final agreement between the human agent and the artificial agent on the evaluation of the text. First results from two tasks completed by 264 students seems to indicate that the artificial agent can support the feedback process by suggesting a useful classification of students' answers in more than the 80% of the sample; within this percentage, the convergence with the human agent's correction is total in 90% of the cases. Further development of the research will include the testing of other LLMs and trials in different subject areas.

References

1. Carless, D.: Exploring learning-oriented assessment processes. *Higher Education* 69, 963-976 (2015).
2. Hattie, J., Clarke, S.: *Visible learning: feedback*. Routledge, London (2018).
3. Winstone, N., Carless, D.: *Designing effective feedback processes in higher education: A learning-focused approach*. London, Routledge (2019).
4. Lipnevich, A. A., & Panadero, E.: A review of feedback models and theories: Descriptions, definitions, and conclusions. In *Frontiers in Education* Vol. 6, 720195. Frontiers. (2021).
5. Henderson, M., Ajjawi, R., Boud, D., Molloy, E. (Eds.): *The Impact of Feedback in Higher Education: Improving assessment outcomes for learners*. Springer Nature (2019).
6. Ajjawi, R., et al.: Feedback that works: a realist review of feedback interventions for written tasks. *Studies in Higher Education* 47(7), 1343-1356 (2022).
7. Bearman, M., et al.: Designing assessment in a digital world: an organising framework. *Assessment & Evaluation in Higher Education* 48(3), 291-304 (2022).
8. Deeva, G., Bogdanova, D., Serral, E., Snoeck, M., & De Weerd, J.: A review of automated feedback systems for learners: Classification framework, challenges and opportunities. *Computers & Education*, 162, 104094 (2021).
9. Gao, R., Merzdorf, H. E., Anwar, S., Hipwell, M. C., & Srinivasa, A.: Automatic assessment of text-based responses in post-secondary education: A systematic review. *Computers and Education: Artificial Intelligence*, 6, 100206 (2024).
10. Dimal, P. A. A., Shanika, W. K. D., Pathinayake, S. A. D., & Sandanayake, T. C.: Adaptive and automated online assessment evaluation system. In 2017 11th International Conference on Software, Knowledge, Information Management and Applications (SKIMA) pp. 1-8. IEEE (2017).
11. Gombert, S., Fink, A., Giorgashvili, T., Jivet, I., Di Mitri, D., Yau, J., Frey, A. & Drachsler, H.: From the Automated Assessment of Student Essay Content to highly informative feedback: A case study. *International Journal of Artificial Intelligence in Education*, 1-39 (2024).
12. Gombert, S., Di Mitri, D., Karademir, O., Kubsch, M., Kolbe, H., Tautz, S., Grimm, A., Bohm, I., Neumann, K., & Drachsler, H.: Coding energy knowledge in constructed responses with explainable NLP models. *Journal of Computer Assisted Learning*, 39(3), 767-786 (2023).



Società Italiana di Ricerca sull'Educazione Mediale



6th International Conference

**Higher Education Learning
Methodologies and Technologies Online**

25-27 September 2024, Rome, Italy

ISBN 978-88-99978-67-9



9 788899 978679