



Teacher education is a deeply pedagogical process rooted in values, ethics, and the social purpose of schooling. Globally, it sits at the core of educational quality and fairness, as research in comparative and international education demonstrates: the training of teachers directly influences students' learning chances, social inclusion, and the democratic aims of schools. Teachers are not simply transmitters of curricula, but active professionals whose convictions, reflective skills, and ability to manage the complexities of classroom life give shape and substance to the educational experience itself.

The pedagogical dimension of teacher education frames teaching as a relational, context-aware, and ethically grounded profession rather than just a set of procedural skills. From a research perspective, this demands robust research methodologies that can critically examine the complex realities of schools and inform evidence-based policies. Equally important is the connection between theory and practice, which helps to bridge the persistent gap between universities and schools.

The contributions gathered in this volume reflect the richness and diversity of experiences showcased during the ATEE Spring Conference 2024, held at the University of Bergamo from May 29 to June 1, 2024. The volume presents 70 selected papers out of more than 300 presented by researchers representing over 40 countries.

This broad spectrum of studies highlights promising directions that can inspire renewed inquiry and concrete proposals aimed at improving contemporary educational systems.

FRANCESCO MAGNI is an Associate Professor of General and Social Pedagogy (PAED-01/A) at the Department of Human and Social Sciences, University of Bergamo, Italy. He is a member of the board and Deputy Director of CQIIA (Center for the Quality of Teaching, Didactic Innovation, and Learning). He is also a member of the ATEE - Association for Teacher Education in Europe.

NICOLE BIANQUIN is an Associate Professor of Didactics and Special Education (PAED-02/A) at the Department of Human and Social Sciences, University of the Aosta Valley, Aosta, Italy. She is a member of the ATEE - Association for Teacher Education in Europe.

ATEE Spring Conference 2024

ATEE Spring Conference 2024

Teacher education research in Europe: trends, challenges, practices and perspectives

May 29th – June 1st, 2024
S. Agostino, Bergamo



Edited by Nicole Bianquin and Francesco Magni



UNIVERSITÀ
DEGLI STUDI
DI BERGAMO

ISBN:978-88-97253-27-3

DOI: [10.62336/unibg.978-88-97253-27-3](https://doi.org/10.62336/unibg.978-88-97253-27-3)



2025



UNIVERSITÀ
DEGLI STUDI
DI BERGAMO | Dipartimento
di Scienze Umane
e Sociali



CQIA

Centro per la Qualità dell'Insegnamento,
dell'Innovazione Didattica e dell'Apprendimento
UNIVERSITÀ DEGLI STUDI
DI BERGAMO



BOOK OF PROCEEDINGS

ATEE Spring Conference 2024

Teacher education research in Europe:
trends, challenges, practices and perspectives

May 29th – June 1st, 2024

S. Agostino, 2 - Bergamo, Italy

Edited by Nicole Bianquin and Francesco Magni



Università degli studi di Bergamo

2025

BOOK OF PROCEEDINGS ATEE Spring Conference 2024. Teacher education research in Europe: trends, challenges, practices and perspectives / Nicole Bianquin, Francesco Magni (edited by) - Bergamo: Università degli studi di Bergamo, 2025

ISBN: **978-88-97253-27-3**

DOI: [10.62336/unibg.978-88-97253-27-3](https://doi.org/10.62336/unibg.978-88-97253-27-3)

This publication is released under the Creative Commons
[Attribution Non-Commercial No Derivatives license \(CC BY-NC-ND 4.0\)](https://creativecommons.org/licenses/by-nc-nd/4.0/)



© 2025 The Authors

<https://aisberg.unibg.it/handle/10446/309209>

An event organised by:

Dipartimento di Scienze Umane e Sociali, **University of Bergamo** // www.dsus.unibg.it

CQIIA – Centro per la Qualità dell’Insegnamento, dell’Innovazione didattica e dell’Apprendimento, **University of Bergamo** // www.cqia.unibg.it

ATEE – Association for Teacher Education in Europe // www.atee.education

In collaboration with:

Siped
Società Italiana di Pedagogia
fondata nel 1989

SIPED
Società Italiana di
Pedagogia

BAUHAUS4EU
European University Alliance

Bahuhus4EU
European University
Alliance



CIRSE
Centro italiano per la
ricerca storico
educativa

SIRD
Società Italiana di Ricerca Didattica

SIRD
Società Italiana di Ricerca
Didattica

SIPSE
SOCIETÀ ITALIANA
PER LO STUDIO DEL
PATRIMONIO
STORICO-EDUCATIVO

SIPSE
Società Italiana per lo
Studio del Patrimonio
Storico-Educativo

**COMENIUS
ASSOCIATION
COMENIUS**

Comenius Association
European Higher Education
Network of Teacher and
Social Education

sipeges
Associazione italiana di pedagogia generale e sociale

SIPeGeS
Società Italiana di
Pedagogia Generale e
Sociale

EFVET
European Forum
of Technical
and Vocational
Education and Training

EfVET
European forum of
Technical and Vocational
Education and Training

SIPeS
Società Italiana
di Pedagogia
speciale

SIPeS
Società Italiana di
Pedagogia Speciale

ETF
Working Together
Learning for All
European Training Foundation

ETF
European Training
Foundation

C.I.R.PED
Centro
Italiano di
Ricerca
Pedagogica

C.I.R.PED
Centro Italiano di
Ricerca Pedagogica

INVALSI

INVALSI
Istituto nazionale per
la valutazione del
sistema educativo di
istruzione e di
formazione

SIREF
Società Italiana di Ricerca Educativa e Formativa

SIREF
Società Italiana di
Ricerca Educativa e
Formativa

**Ufficio
Scolastico
Territoriale
di Bergamo**

**Ufficio Scolastico
Territoriale di Bergamo**

Conference Chair

Nicole Bianquin, associate professor in Special Education, University of the Aosta Valley, ATEE member;

Francesco Magni, associate professor in Education, University of Bergamo, ATEE member.

Scientific committee

Adolfo Scotto Di Luzio, Vice-Rector for Didactics, Guidance and Placement, University of Bergamo, Italy

Marco Lazzari, Head of the Department of Human and Social Sciences, University of Bergamo, Italy (until September 2024).

Anna Maria Falzoni, Director of CQIIA - Centre for Teaching Quality, Teaching Innovation and Learning, University of Bergamo, Italy

Maria Assunção Flores, University of Minho, Portugal

Joanne Banks, Trinity College of Dublin, Ireland

Federica Baroni, University of Bergamo, Italy

Tore Bernt Sorensen, University of Glasgow,

Scotland (UK)

Paolo Bertuletti, University of Bergamo, Italy

Serenella Besio, University of Bergamo, Italy

Antonio Borgogni, University of Bergamo, Italy

T.J. Ó Ceallaigh, University College Cork, Ireland;

ATEE AC member

Monica Crotti, University of Bergamo, Italy

Linda Daniela, University of Latvia, Latvia

Dietmar Frommberger, University of Osnabrück,

Germany

Paola Gandolfi, University of Bergamo, Italy

Mabel Giraldo, University of Bergamo, Italy

Etti Gordon Ginzburg, Oranim College of Education,

Israel

Michiel Heijnen, Marnix Academy, Netherlands; ATEE

AC President

Erika Kopp, Eötvös Loránd University, Hungary;

ATEE AC member

Marta Kowalczyk-Walędziak, University of Białystok,

Poland

Anna Lazzarini, University of Bergamo, Italy

Hagen Lehmann, University of Bergamo, Italy

Nicola Lovecchio, University of Bergamo, Italy

Gale MacLeod, University of Edinburgh, Scotland

(UK)

Fernando Marhuenda Fluixá, Universitat de València, Spain

Alessandra Mazzini, University of Bergamo, Italy

Sara Nijs, Leuven University, Belgium,

Katrin Poom-Valickis, University of Tallinn, Estonia

Andrea Potestio, University of Bergamo, Italy

Evelina Scaglia, University of Bergamo, Italy

Johannes Karl Schmees, Norwegian University of

Science and Technology (NTNU), Norway

Leah Shagrir, Levinsky College of Education, Israel;

ATEE AC member

Olena Shyyann, Lviv State University of Physical

Culture, Ukraine; ATEE AC member

Vasileios Symeonidis, Pädagogische Hochschule

Freiburg, Germany

Ronny Smet, Karel de Grote University of Applied

Science and Arts, Belgium; RDCs Coordinator of

ATEE

Agnieszka Szplit, Jan Kochanowski University of

Kielce, Poland; ATEE AC Vice-President

Elena Theodoropoulou, University of the Aegean,

Greece

Philippe Tremblay, Université de Laval, Québec

Vidmantas Tūtlys, Academy of Education, Vytautas

Magnus University, Lithuania

Wieland Wermke, Stockholm University, Sweden

Mara Westling Allodi, Stockholm University, Sweden

Jenny Wilder, Stockholm University, Sweden

Rano Zakirova Engstrand, Stockholm University,

Sweden

Organizing committee

Virginia Capriotti, University of Bergamo

Sara Cecchetti, University of Bergamo

Federico Chiappetta, University of Bergamo

Emilio Conte, University of Bergamo

Ester Guerini, University of Bergamo

Paolo Lazzaroni, University of Bergamo

Alice Locatelli, University of Bergamo

Isabel Maggiarra, University of Bergamo

Fabio Sacchi, University of Bergamo

Arianna Taravella, University of Bergamo

Table of contents

Introduction

Francesco Magni, Nicole Bianquin, *Back to the Core: Rediscovering the Power of Teacher Education Research* 7

Teacher education and pedagogical perspective in uncertain times: history, theory, policies and practices

Brigitta Bekesi, Eva Ulbrich, Tony Houghton, Jana Trgalova & Zsolt Lavicza, *The Reflected Double Tetrahedron Model: Project-based learning in teacher training* 11

Andrea Dessardo, «*The Italian didactic secret*». *Teachers' education according to Giuseppe Lombardo-Radice's thought* 19

Ylenia Falzone & Alessandra La Marca, *Lifelong Learning for Mongolia: Occupational Health & Safety project (3L4MHOS)* 25

Ylenia Falzone, Benedetta Miro & Elif Gülbay, *Teachers and Artificial Intelligence: Developing Digital Citizenship Skills* 31

Eleonora Florio, Tanu Biswas, Ilaria Castelli & Letizia Caso, *Bleak Pedagogy: A new term unveiled from research on Adultcentrism* 38

Deirdre Harvey & Maria Campbell, *Promoting and supporting learner resilience in the hospital school* 44

Aggelos Kavasakalis & Angeliki-Despoina Varouxi, *Reasons and beliefs of (Greek) teachers for participating in an MSc relevant to their profession* 54

Semih Kaygisiz & Hanife Akar, *Challenges Head to Train Culturally and Linguistically Responsive Teachers* 62

Sabina Leoncini, *Gender Stereotypes between School and Guidance: A Look at European Regulations and Vocational Education in Italy* 69

Silvia Maggiolini & Elena Zanfroni, *Emergency and people with intellectual disabilities. Teachers' training in the LEBEL proposal* 77

Cristina Miralles-Cardona, María C. Cardona-Moltó & José M. Esteve-Faubel, <i>Gender-responsive teaching: What strategies are teacher educators using for gender mainstreaming implementation?</i>	83
Benedetta Miro & Alessandra La Marca, <i>Service Learning in teacher education for soft skills development</i>	93
Georgia Natsiou & Melpomeni Tsitouridou, <i>Reflecting together online and offline: A systematic review on the types of peer reflection activities in teacher education</i>	102
Laura Parigi & Maria Elisabetta Cicognini, <i>Exploring the Transformative Impact of Teacher Professional Development on Student-Centered Assessment Approaches</i>	109
Francesca Pileggi, <i>Non-cognitive competence and critical-creative skills. A critical review of the current perspectives</i>	116
Francis J. Prescott-Pickup, <i>Finding a successful teacher identity: the role of the mentor-mentee relationship</i>	122
Nathanaili Valbona, <i>Analyzing poor academic performance of Albanian pupils in PISA</i>	129
Elena Zanfroni, <i>Problematic behaviours and classroom management: teachers' representations</i>	137

Teaching and learning challenges and professional development

Monica Banzato, <i>Attitudes of Humanities Students and Aspiring Teachers Toward Quantitative Educational Research: An Introductory Study</i>	146
Ane Bergersen, <i>Global awareness and professional teacher competence through student mobility from Norway to Zambia</i>	152
Barbara Bocchi, Elena Bortolitti & Paola Damiani, <i>Informal Support Teacher Networks: training and self-training between Communities of Practice</i>	160
Barbara Bocchi, Elena Bortolitti, Paola Damiani, Giuseppe Filippo Dettori & Barbara Letteri, <i>The use of artificial intelligence (AI) in inclusive learning: an exploratory investigation</i>	167
Virginia Capriotti, <i>The Impact of Teaching and Learning Centers (TLCs) on Initial Teacher Education Programs in Italy</i>	176
Giorgia Coppola, <i>From Burnout toward Pedagogical Teacher Education. A communities perspective</i>	183
Alexandra Efstathiades, Christiane Gesierich, Christian Rudloff & Anna Kapsalis, <i>FOOTT PRINTTS: Advancing Quality Standards in Teacher Training</i>	189

Elena Gabbi, Ilaria ancillotti & Maria Ranieri, <i>Rethinking digital competences for teaching in the Post-Covid Era: A participatory approach</i>	197
Marco Giganti, <i>Emergency Remote Teaching and Teacher Training: The Role of Implicit Beliefs in Lasting Educational Change</i>	205
Hege Knudsmoen & Mette Birgitte Helleve, <i>Develop teachers' professional identity through global internship</i>	212
Charlotte Kohlloffel, <i>Opening the black box of writing instruction in times of change: insights from Italian secondary school teachers</i>	220
Regine Lehberger, <i>A learning-design to promote reflection and digital media skills for professionalisation of teacher students</i>	229
Marica Liotino, Taiwo Isaac Olatunji, Marianne Grace Araneta, & Monica Fedeli, <i>Reflective Practice in MOOCs: Exploring the Role of Tutors and Fostering Teacher Professional Development</i>	236
Cristina Lisimberty & Katia Montalbetti, <i>Guiding students from lower to upper secondary: a challenging and shared task for families and schools</i>	244
Sabrina Natali, <i>Rethinking teacher training in emotional education through sports</i>	256
Sara Nosari & Emanuela Guarcello, <i>The question of non-cognitive skills and the cheetah's coat perspective</i>	262
Alessandro Oro, Ira Vannini & Elisa Guasconi, <i>A formative assessment framework to develop primary school pre-service and in-service teachers' video analysis programs</i>	271
Federica Pelizzari & Simona Ferrari, <i>Exploring Coding and Educational Robotics in Primary Schools. Results and Perspectives from an Action Research Approach to Teaching Innovation</i>	278
Annfrid Rosey & Tove Leming, <i>Internationalization in Teacher Education: How can student practice in Southern Africa contribute to strengthening the professional work as teachers in Northern Norway?</i>	293
Stefano Spennati, <i>Educating on complexity at the time of transition</i>	300
Chiara Urbani, <i>Collaborative and epistemic advances: a study on teacher agency</i>	305
Gerd Wikan, <i>Global Teachers and Practicum in the Global South. A study of Long-Term Impact of International Practicum in Namibia</i>	312
Franco Zengaro & Sally A. Zengaro, <i>Teachers Reflect on Their Identities as Former Students and Future Teachers</i>	318
Sally A. Zengaro & Franco Zengaro, <i>Supporting Active Learning in Online Learning: Creating a Culture of Care</i>	326

Inclusion in teaching and learning processes and school improvement

Luca Angelone & Federica Festa, <i>Cultivating Inclusive Education: A Collaborative Journey of Secondary School Teachers in Promoting Cognitive and Linguistic Accessibility through Picture Books and AAC</i>	333
Luca Ballestra Caffaratti, Cecilia Marchisio, Alessandro Monchietto, Alessandro Zanzo & Marco Secchia, <i>The Use of Artificial Intelligence in Secondary Schools: Experiences in Initial Teacher Training</i>	340
Daniele Bullegas & Martina Monteverde, <i>Theory into practice: exploring teacher perceptions about Early Intervention in the Italian school system</i>	346
Sara Cecchetti & Nicole Bianquin, <i>The work plan (Plan de Travail) as an educational device that addresses everyone's needs. A survey of teachers' and pupils' perspectives</i>	354
Federica Cilia, Jeanne Kruck, Marie-Hélène Plumet & Mélina Dell'armi, <i>Well-Being and Social Participation of Autism Spectrum Disorder Students at University: the impact of Atypie Friendly Inclusion Program</i>	362
Alice Di Leva & Federica Festa, <i>The Student Voice in teacher training, an investigation into the inclusiveness of European practices</i>	370
Ilaria Folci & Anna Monauni, <i>Differentiation in Preschool. Pedagogical Issues and Best Practices</i>	378
Mabel Giraldo & Fabio Sacchi, <i>Planning the transition to adulthood for students with disabilities: knowledge, perceptions, challenges from STRADE teacher training program</i>	384
Jørgen Klein, Ann Sylvi Larsen & Tove Grete Lie, <i>'People are people' - An investigation of long-term impacts of an international practicum</i>	393
Daniela Maccario & Annamaria Garibaldi, <i>Helping to learn. What are good practices of educational intervention? Structure and preliminary results of a participatory research study</i>	400
Cecilia Marchisio & Alessandro Monchietto, <i>Improving Inclusive Education: The Turin Model of Collaboration between Schools, Universities and Communities</i>	405
Francesca Placanica, Rosa Sgambelluri & Alessandra Priore, <i>Life Designing and inclusive prospects in Italian schools</i>	411
Ilaria Ravasi, <i>Preventing early school leaving. Perspectives of intervention research between school and territory</i>	417

Digital innovation and artificial intelligence (AI): schools, teachers and students between real and virtual world

Valentina Berardinetti, Michele Ciletti, Andreana Lavanga & Giusi Antonia Toto, <i>Digital Innovation and Artificial Intelligence in Museum Education: perspectives, debates and psychological implications</i>	424
Roxana-Madalina Cristea, <i>Investigating the Relationships between In-service Teachers' Technology Pedagogy Content Knowledge and Virtual Learning Environment Success</i>	432
Francesca De Vitis & Marcello Tempesta, <i>Touch in small hands. Responding to the challenges of technology in childhood 0-6</i>	439
Silvia Larghi & Edoardo Datteri, <i>Programming errors and the attribution of intentionality to educational robots</i>	445
Juliana Elisa Raffaghelli, Francesca Crudele, Laura Foschi & Graziano Cecchinato, <i>Let me introduce open education... Facilitating Prospective teachers' understanding of open Education through an ai-based tool</i>	453
Alice Roffi, <i>Digital technologies and collaborative activities for science teaching in the upper secondary school: a qualitative study on teacher's perspective</i>	464
Alice Roffi, Gabriele Biagini, Stefano Cuomo & Maria Ranieri, <i>Development of teachers' competences on Learning Design and on supporting student's Self-Regulated Learning in the lower secondary school</i>	472
Marcello Tempesta, <i>Teacher education and motivation culture</i>	481

School & work and the role of teachers in Vocational Education and Training

Maria Concetta Carruba, Mariateresa Cairo & Magdalena Tsoneva, <i>Comparative Analysis of Inclusive Education Practices in Italy and Bulgaria: Reflections from the Erasmus Plus ASuMIE Project</i>	488
Valerio Ferrero, <i>Teacher Education as a Game Changer: Non-Traditional Factors of Inequality and the Role of Teachers for Equity</i>	494
Anna Granata & Valerio Ferrero, <i>Beyond Patriarchy: Teaching Profession, Gender Issues and Teacher Education in Italy</i>	502
Paola Zini & Dalila Raccagni, <i>Teacher training and well-being best practices: the 3H project</i>	508



POSTER SESSION

Antinea Ambretti, Chiara Gamberini & Arianna Fogliata, *Integration of the Sincrony method in physical education during school age in the digital era* 517

Francesca Finestrone, *Music as an inclusive tool for promoting a sustainable Culture* 523

Francesca Finestrone, Francesco Pio Savino, Leonardo Palmisano & Giusi Antonia Toto, *Nature Connection and Music in Early Education: Insights from the CNS-ch Scale and TEAL Methods* 532

Paula Matijašević, Bruno Matijašević, Ana Žnidarec Čučković & Vesna Babić, *Kinesiologists' and Coaches' Self-Assessment of Their Pedagogical Competences* 538

The contributions published in this book of proceedings have been evaluated through a double-blind peer review process. We would like to thank the members of the Scientific Committee, as well as the many other professors, researchers and experts who agreed to act as reviewers.

Lifelong Learning for Mongolia: Occupational Health & Safety project (3L4MHOS)*

Ylenia Falzone, *University of Palermo*, ylenia.falzone@unipa.it
Alessandra La Marca, *University of Palermo*, alessandra.lamarca@unipa.it

Abstract

The *Lifelong Learning for Mongolia: Occupational Health & Safety (3L4MOHS)* project aims to strengthen Mongolian higher education institutions (HEIs) by enhancing their capacity for industrial workforce training and addressing critical Occupational Health and Safety (OHS) issues. The project will establish fully equipped OHS Centers in four Mongolian universities and provide training for teaching and administrative staff, led by international experts. Focusing on Work Package 2 (WP2), the project seeks to train teaching staff, modernize curricula with digital tools (e.g., AR/VR), and develop innovative pedagogical methods to ensure equitable lifelong learning access. Outcomes include improved teaching quality, governance, and internationalization of Mongolian HEIs.

Keywords: digital transformation; lifelong learning; teacher training; e-learning; pedagogical innovation.

ISBN: 978-88-97253-27-3
DOI: [10.62336/unibg.978-88-97253-27-3_p.25](https://doi.org/10.62336/unibg.978-88-97253-27-3_p.25)

* The contribution is the result of the authors' joint reflection and research. Specifically, Y. Falzone authored paragraphs 2, 2.1 and conclusion and A. La Marca authored paragraph 1.

1. The impact of emerging technologies for lifelong learning

Over the past decade, the use of technology in education has transformed numerous aspects of learning. The increasing availability of educational resources and the expansion of higher education beyond traditional classrooms have created new opportunities for both teachers and students. Technology has facilitated personalized learning experiences, enhanced collaborative tools, and introduced innovative teaching methods such as virtual classrooms, interactive simulations, and adaptive learning platforms. These advancements have not only improved the quality of education but also promoted inclusivity, enabling learners from diverse backgrounds to participate and succeed in their academic journeys (Celik, 2023).

The provision of lifelong learning opportunities and its role in the higher education system must be rethought to include new educational designs tailored to the digital era (Zgaga et al., 2019). This shift requires reimagining learning frameworks to integrate flexible, accessible, and technology-enabled approaches that cater to diverse learner needs. Countries worldwide, as well as transnational organizations, have increasingly emphasized the development of lifelong learning initiatives in their higher education policy documents (Shava et al., 2023; Bond et al., 2018). Such policies highlight the need for systemic reforms aimed at fostering a culture of continuous learning and enhancing the employability and competitiveness of graduates in a globalized economy.

For instance, the United Nations Educational, Scientific, and Cultural Organization (UNESCO) advocates for a broader vision: "The right to education must be expanded to be lifelong and encompass the right to information, culture, science, and connectivity" (UNESCO, 2021, p. 4). This perspective underlines the importance of integrating lifelong learning as a core component of higher education, ensuring its alignment with the demands of the knowledge society and fostering inclusive and equitable access to learning opportunities for all. Lifelong learning as a guiding principle appears in the Sustainable Development Vision (SDV) 2030 as:

«A civil and lifelong education system must be open, accessible and of high quality. Lifelong learning is a key principle of Sustainable Development Goal 4 with which countries committed to 'ensure inclusive and equitable quality education and promote lifelong learning opportunities for all [...] It includes learning activities for people of every age, in all contexts (family, school, community, workplace, etc.) and using different modalities (formal and informal education), which together respond to a wide range of learning-related needs and demands» (UNESCO, 2020, p. 18).

The integration of digital technologies in education has transformed traditional teaching methods, making learning more accessible, interactive, and personalized. In this context, technology-based learning plays a crucial role in training and professional development, contributing to a proactive and resilient educational system.

Such a system requires forward-thinking educational policies capable of anticipating innovation and actively supporting the digitalization process. This approach has been a cornerstone of European policies over the past decade, as highlighted by the European Commission (2020). Specifically, strategies like the Digital Education Action Plan have aimed to strengthen the digital skills of students and teachers, promoting equity and inclusion in access to technology (Pedone, 2021).

Learning, therefore, serves as the foundation for the digital transition, not only facilitating the adoption of new technologies but also preparing the workforce and citizens to live and operate effectively in an increasingly interconnected and data-driven society. This transformation requires investments in technological infrastructure, continuous training, and the development of transversal skills such as critical thinking, creativity, and problem-solving, which are essential to addressing future challenges.

Mongolia is situated in a unique socio-economic context, characterized by frequent changes in political governance over the past decades, as highlighted in UNESCO's 2020 report *Mongolia, Education Policy Review: Towards a Lifelong Learning System*. This complex scenario presents a range of challenges for education, making it crucial to adopt an educational system that promotes lifelong learning.

Initiating a lifelong learning project in Mongolia addresses the need to overcome structural and social barriers that limit equitable access to education, particularly for marginalized populations. Proposed solutions include the use of e-learning resources, standardized educational policies to improve access to education, and strengthening professional training for teachers. In this context, a lifelong learning project becomes essential to meet the needs of an inclusive and sustainable education system, capable of supporting the growth and integration of all citizens into modern society. Another critical aspect involves translating international educational concepts into the local context. The challenge lies not only in translating educational terms but in making them resonate with Mongolia's cultural and social reality. Therefore, the introduction of a lifelong learning system is not just about adopting global educational models, but also about adapting them to the specific needs of the country, creating an educational vision that truly reflects the unique features and challenges of the Mongolian context.

2. The Lifelong Learning for Mongolia: Occupational Health & Safety (3L4MOHS) project

In the unique context of Mongolia, characterized by distinctive geographic challenges, occupational health and safety (OHS) education emerges as an indispensable element to protect the well-being of workers and support sustainable economic and social development. The complex nature of the Mongolian terrain, with remote industrial areas and extreme climatic conditions, underscores the importance of adopting innovative and inclusive educational strategies to address these critical issues. Lifelong education in Mongolia emerged in response to strong socio-economic needs during the 1990s, following the country's transition to democracy and a market economy. The 1991 Education Law formalized lifelong learning as a sub-sector of the education system, paving the way for the establishment of dedicated centers at both national and local levels. Despite the progress made, numerous challenges remain, including an inadequate regulatory framework, financial constraints, a shortage of qualified human resources, and accessibility issues (Yembuu, 2021).

The project (3L4MOHS) aims to transfer know-how from the European part of the Mongolian partners, in order to Develop and Implement Lifelong Learning Centres at University level. With the increasing advancement of technology and the emergence of digital platforms, Mongolia is well positioned to integrate e-learning methodologies into its OHS education system. This transition presents an opportunity to overcome logistical barriers traditionally associated with face-to-face training, such as long distances to travel and difficult weather conditions. The adoption of digital solutions not only improves accessibility, but also allows for the customization of training paths, tailoring them to the specific needs of workers in different sectors. In addition, the implementation of lifelong learning programs within the occupational health and safety educational framework could help foster a culture of prevention and shared responsibility. These programs, combined with the use of digital tools, offer an effective means of disseminating knowledge, updating skills and raising awareness of occupational hazards among workers, with a positive impact on productivity and quality of life.

Although the integration of digital tools into lifelong learning in Mongolia offers significant advantages, we are fully aware of the challenges associated with their implementation.

Internet access, for instance, remains a major issue in Mongolia, particularly in rural and remote areas where infrastructure is limited and connection costs are high (Tuul et al., 2016). This digital divide creates a gap between urban and rural populations, limiting the ability of those in disadvantaged areas to benefit from digital learning resources. Moreover, hardware limitations – including the limited availability of computers, tablets, and smartphones – further hinder the implementation of digital tools. For this reason, the project has provided for the purchase and distribution of appropriate technological resources, to concretely support educational activities in local contexts.

In addition to infrastructural and financial challenges, it is also essential to address the resistance to change among both teachers and students. Some educators may lack the necessary skills and knowledge to effectively integrate digital tools into their teaching practices, while others may be reluctant to adopt new methodologies due to their familiarity with traditional approaches. To tackle

these issues, specific training sessions on the use of digital devices in education have been launched, along with capacity-building activities focused on the design and management of Learning Management Systems (LMS).

For the implementation of the project, the analysis of the Educational needs highlighted significant gaps and crucial requirements in the Mongolian educational system, with a focus on occupational health and safety (OHS) training. Currently, Mongolia's educational landscape lacks structured OHS training courses at the higher education level. Available training is mainly delivered by NGOs or independent centers, often run by instructors who lack advanced teaching skills and experience in designing training content. This lack compromises the quality and effectiveness of training for students and workers, with direct repercussions on safety and well-being in the workplace.

To gain a deep understanding of the specific needs and requirements of the Mongolian partners, a focus group was organized during the first training session dedicated to digital pedagogies. The session involved nine stakeholders from educational institutions, training organizations, and non-governmental organizations operating in Mongolia. The aim of the meeting was to gather direct insights into the current challenges faced by the educational system, as well as to identify good practices and effective solutions that could be adapted and enhanced within the framework of the project activities. Through a structured and participatory dialogue, participants shared their experiences regarding the integration of digital technologies in teaching, professional training in specific areas – such as occupational health and safety – and the main infrastructural and methodological challenges.

One of the central issues that emerged from the survey conducted is the need to supplement theoretical instruction with practical sessions. The latter are considered crucial for translating knowledge into applicable skills. Practical sessions, combined with courses organized directly in workplaces, were identified as highly efficient training methods, capable of responding pragmatically to the needs of students and companies, and also offering a cost-effective solution for many organizations.

Another critical element concerns the need to modernize and digitize education delivery methods. The integration of advanced technological tools such as instructional videos, virtual reality and interactive platforms enhances both education accessibility and the quality of learning. Specifically, the digital transformation of education can enable the personalization of training and provide immersive experiences that increase the effectiveness of knowledge transfer. In addition, the project emphasized the role of innovative pedagogical approaches, including blended learning and gamification, in adapting educational content and methods to the specific needs of the Mongolian context.

The project placed special emphasis on collaboration with industry stakeholders and government partners, recognizing the importance of alignment between the education system and labor market needs. This synergy is crucial for ensuring the relevance and effectiveness of the educational programs in order to produce a tangible impact on the national economy. The direct involvement of key stakeholders allowed educational innovation to be tailored to the country's strategic priorities, ensuring that the benefits of training extended not only to individual workers, but also to the overall growth of the productive sector and Mongolia's economic sustainability.

2.1 Innovative Strategies and Challenges in the Digitalization of Higher Education in Mongolia: European Literature Review

Taking note of the needs outlined above, the specific objectives of the project include the need to establish Lifelong Learning Centres (LLCs) in Mongolian Higher Education Institutions, which will act as hubs for lifelong learning, exploiting modern digital tools to improve the quality of learning. With the aim of responding to the needs of the Mongolian context and in order to support the digital transformation and digitisation of learning delivery methods and teaching in training curricula, a European literature review was conducted to identify innovative practices, training methodologies and tools for OHS training. Through the analysis of successful implementation cases, potential barriers to the use of digital tools for OHS training emerged, providing a comprehensive picture of the opportunities and challenges.

Based on the analysis conducted, a detailed report was compiled summarising the most cutting-edge European trends, practices and teaching methodologies for e-learning training.

It was found that gamification stands out as a particularly effective strategy. The integration of typical game elements, such as evaluation systems, challenges and rewards, enhances learner engagement and fosters more robust learning outcomes. Recent studies confirm that these practices have no negative side effects and represent a dynamic solution for encouraging active student participation while promoting a more motivating and personalised learning process (Lipnicka, 2020; van Gaalen et al., 2021; Rodeghiero Neto & Amaral, 2024).

The project, for the digital transformation of the teaching-learning process, also envisages the use of Virtual Reality (VR) tools, which are becoming more relevant in educational and professional contexts. The literature highlights how such technologies have positive effects on risk reduction and increased cognitive retention (Gulbay & Leone, 2024). In particular, VR proves to be an irreplaceable resource for simulating hazardous situations that would be impossible to replicate in reality, such as possible contamination situations in industry. This experiential learning mode not only stimulates engagement, but also facilitates a deeper and more lasting understanding of safety and health content in hazardous work environments (Junaini et al., 2022). Although AR can offer significant benefits, it is crucial to carefully consider how to implement it in the educational context to maximise the benefits and reduce any frustrations or difficulties students may have. The use of AR visors, such as Hololens, means that users cannot make direct eye contact, reducing non-verbal communication and emotional expressions, which are important for effective collaboration (Radu & Schneider, 2019). Finally, the analysis shows the importance of integrating the different digital tools mentioned with the adoption of active learning strategies. For instance, the combined approach integrating techniques such as gamification and problem-based learning (PBL) has been shown to be particularly effective in improving educational outcomes. However, the report also highlights some of the difficulties and challenges involved in implementing this training, such as increased workload for teachers and resistance to change on the part of students.

The implementation of digital tools in education faces complex challenges related to digital inequalities, institutional rigidities and insufficient technological skills (UNESCO, 2023). Socio-economic and geographical disparities limit equitable access to resources, while resistance to change hinders the adoption of innovative methodologies. Lack of adequate training for teachers and students, combined with deficiencies in technical support and availability of up-to-date resources, reduce the effectiveness of digital technologies. In addition, ineffective communication undermines interaction and motivation in online learning. Overcoming these barriers requires an integrated approach to promote equity, innovation and inclusiveness.

In the specific context of Mongolia, the project aims to establish centres for lifelong learning and digital transformation as hubs for educational innovation and inclusion. These centres will serve as hubs for the professional training of teachers, for the testing of innovative digital teaching tools and for direct support to local schools in the transition to hybrid and digitised teaching models. By conducting case studies on successful experiences and using advanced digital platforms, the project intends to provide stakeholders with operational tools and evidence-based knowledge to foster the effective and sustainable integration of ICT. Thus, teacher training emerges as a key element for the success of e-learning technologies, and this is the ultimate goal of WP2. It is crucial that educators receive adequate and targeted training that makes them fully prepared to integrate digital tools into their teaching practice. Only through solid and continuous training can the effective use of technologies be ensured, thereby optimising the benefits for students.

3. Conclusion

The conclusions emerging from the proposed analysis highlight the importance of promoting quality education in Mongolia through targeted and strategic interventions. Health and safety training, selected as a pilot curriculum, proves crucial for strategic sectors such as mining, construction and

agriculture, demonstrating how educational innovation can have a significant impact on sectors crucial to the national economy.

However, there is a noticeable absence of Lifelong Learning Centres in higher education, a void that limits the continuous development of the skills needed to meet the challenges of the contemporary labour market. The digitisation of courses and the introduction of advanced technological tools are therefore essential to improve the quality and standards of education in Mongolian academic institutions. These interventions represent not only an opportunity for technological upgrading, but also a means of bridging the gap between higher education institutions and other stakeholders, fostering sustainable growth and the creation of new job opportunities.

The establishment of Lifelong Learning Centres and the digitisation of education are key levers for modernising the Mongolian education system, strengthening the link between education and economic and social development. However, constant collaboration with Mongolian partners enables us to gather continuous feedback on the concrete needs and requirements of local contexts, thus ensuring the effectiveness and sustainability of ongoing activities.

These efforts represent an essential step towards an inclusive and innovative education system, capable of responding to local needs and aligning with global trends.

Bibliography

- Bond, M., Marín, V. I., Dolch, C., Bedenlier, S., & Zawacki-Richter, O. (2018). Digital transformation in German higher education: student and teacher perceptions and usage of digital media. *International journal of educational technology in higher education*, 15(1), 1-20.
- Celik, I. (2023). Towards Intelligent-TPACK: An empirical study on teachers' professional knowledge to ethically integrate artificial intelligence (AI)-based tools into education. *Computers in Human Behavior*, 138, 107468.
- Gulbay, E., & Leone, A. (2024). Embodied Learning with Augmented Reality: Future Teachers' Perspectives. *PEDAGOGIA E VITA*, 81(3), 101-120.
- Junaini, S., Kamal, A. A., Hashim, A. H., Mohd Shaipullah, N., & Truna, L. (2022). Augmented and Virtual Reality Games for Occupational Safety and Health Training: A Systematic Review and Prospects for the Post-Pandemic Era. *International Journal of Online and Biomedical Engineering (iJOE)*, 18, 43-63. <https://doi.org/10.3991/ijoe.v18i10.30879>
- Lipnicka, M. (2020). *Gamification and Occupational Safety and Health Training: Possibilities for Development in the Latvian Context*. (Master's degree Thesis, Oulu University of Applied Sciences). <http://www.theseus.fi/handle/10024/353019>
- Pedone, A. (2021). I sistemi di formazione e la transizione digitale. Dalla risposta all'emergenza al piano d'azione per l'istruzione e la formazione digitale. In *XLII CONFERENZA ITALIANA DI SCIENZE REGIONALI*.
- Radu, I., & Schneider, B. (2019, May). What can we learn from augmented reality (AR)? Benefits and drawbacks of AR for inquiry-based learning of physics. In *Proceedings of the 2019 CHI conference on human factors in computing systems* (pp. 1-12).
- Rodeghiero Neto, I., & Amaral, F. G. (2024). Teaching occupational health and safety in engineering using active learning: A systematic review. *Safety Science*, 171, 106391. <https://doi.org/10.1016/j.ssci.2023.106391>
- Shava, G. N., Mkwelie, N., Ndlovu, M. J., & Zulu, E. (2023). Higher Education Institutions' Sustainable Development towards Agenda 2030: A Global Goals in Policy and Curriculum. *International Journal of Research and Innovation in Social Science*, 7(4), 1320-1336.
- Tuul, S., Banzragch, O., & Saizmaa, T. (2016). E-learning in Mongolian higher education. *International Review of Research in Open and Distributed Learning*, 17(2), 181-197.
- UNESCO. (2020). *Mongolia education policy review: Towards a lifelong learning system*. United Nations Educational, Scientific and Cultural Organization.
- UNESCO. (2021). *Reimagining our futures together: A new social contract for education*. Paris, France: Educational and Cultural Organization of the United Nations.
- UNESCO. (2023). *Institutional practices of implementing lifelong learning in higher education: Research report*. Retrieved 29 May 2024, from <https://unesdoc.unesco.org/ark:/48223/pf0000385434>
- van Gaalen, A. E. J., Brouwer, J., Schönrock-Adema, J., Bouwkamp-Timmer, T., Jaarsma, A. D. C., & Georgiadis, J. R. (2021). Gamification of health professions education: A systematic review. *Advances in Health Sciences Education*, 26(2), 683-711. <https://doi.org/10.1007/s10459-020-10000-3>
- Yemtuu, B. (2021). Intergenerational learning of traditional knowledge through informal education: the Mongolian context. *International Journal of Lifelong Education*, 40(4), 339-358.
- Zgaga, P., Teichler, U., Schuetze, H. G., & Wolter, A. (2019). *Higher education reform: Looking back – looking forward*. (Vol.8). Berlin: Peter Lang.