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Artificial intelligence competence needs for youth workers

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Abstract. This work addresses the increasing need for youth professionals to acquire competencies that enable the meaningful integration of Artificial Intelligence (AI) into non-formal and formal educational contexts. Against the backdrop of accelerated digital transformation, youth workers in Europe face challenges in understanding, adopting, and ethically applying AI technologies. This work, undertaken within the framework of the Erasmus+ co-funded initiative Artificial Intelligence for Youth Work (AI4YouthWork), seeks to define the requisite knowledge, skills, and attitudes for responsible AI use in youth work settings.

The research followed a mixed-methods design, combining desk research, policy analysis, and empirical data collection through semi-structured interviews and focus groups involving youth workers from Italy, Romania, Greece, and Portugal. The findings informed the development of an AI Competence Framework and the validation of targeted educational resources.

The analysis revealed significant variability in AI awareness among youth professionals, accompanied by uncertainty regarding ethical implications and practical implementation. The validated competence framework captures four critical dimensions: technical under- standing of AI, ethical reasoning, human-centred application, and the societal and environmental implications of AI. Complementary outputs include a multilingual eLearning catalogue (comprising 48 open educational resources) and a practical training toolkit with curated AI tools and youth-focused workshop templates.

This work contributes to the digital capacity-building of youth professionals by offering a structured, scalable model for the integration of AI in youth work. The findings underscore the necessity of embedding AI education within inclusive, ethically grounded, and context-sensitive training strategies. The proposed framework and supporting tools provide a foundation for long-term transformation in digital youth work across Europe.

Keywords: Artificial intelligence; Youth work; Competence framework; Non-formal education; Digital capacity-building.

1. Introduction

The rapid evolution of Artificial Intelligence (AI) technologies is significantly transforming contemporary societies, reshaping the ways individuals learn, work, and interact (Holmes et al., 2019; UNESCO, 2021). In the context of youth work, particularly within non-formal educational settings, AI has the potential to serve as a powerful catalyst to improve educational quality, participation, and personalisation (Luckin et al., 2016; Zawacki-Richter et al., 2019). How- ever, while young people who are digital natives increasingly explore and adopt tools powered by AI (Livingstone &

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Helsper, 2007), professionals of youth often face challenges in understanding, adapting to, and ethically applying these technologies in their practice (Pawluczuk, 2023).

The integration of AI into youth work introduces a dual imperative: first, to ensure that professionals are equipped with the necessary competencies to use AI responsibly and effectively; and second, to support young people in critically engaging with AI in ways that promote digital citizenship, social inclusion, and personal development (European Commission, Directorate-General for Education, Youth, Sport and Culture, 2022; Redecker, 2017). Addressing this dual challenge requires a coherent framework that defines the knowledge, skills, and attitudes that youth workers need to thrive in AI-augmented environments (Council of Europe, 2015; Evrard et al., 2023).

This work was carried out within the framework of the AI4YouthWork project, a transnational initiative co-funded by the European Union through the Erasmus+ Program. The project was designed to develop a validated AI competency framework for youth workers, as well as to produce a set of open, multilingual learning resources and tools aimed at promoting AI literacy, ethical awareness and practical skill building in the youth sector (Lanzetta et al., 2024).

The objective of this work is to contribute to the digital transformation of youth work by conceptualising, developing, and validating a structured framework of AI competencies for professionals who work with young people. In doing so, it addresses critical gaps in digital capacity, pedagogical integration, and ethical preparedness (Carretero et al., 2017; Vuorikari et al., 2022). The significance of this research lies in its potential to inform policy, improve training practices, and foster responsible adoption of AI in youth-centred educational contexts throughout Europe and beyond.

2. Research methodology

This work employed a structured, mixed-methods research design to develop, refine, and validate a competence framework for Artificial Intelligence (AI) integration in youth work. The methodological approach combined qualitative and documentary research techniques across four European countries: Italy, Romania, Greece, and Portugal. The methodology was designed to ensure inclusivity, contextual relevance, and empirical validity of the project outcomes (European Commission, Directorate-General for Education, Youth, Sport and Culture, 2022; Redecker, 2017).

2.1 Desk Research

The initial phase involved a comprehensive desk review of relevant literature, policy documents, digital education strategies, and training models. Sources included European Commission reports, national AI strategies, academic publications on AI in education, and practitioner guidelines for youth work (Carretero et al., 2017; Evrard et al., 2023). The purpose was to establish a baseline understanding of existing AI competence frameworks and identify gaps in youth-sector applications.

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2.2 Qualitative Field Research

Empirical data were collected through semi-structured interviews and focus group discussions with youth workers, educators, and institutional stakeholders in each participating country. A total of 68 participants were engaged across 12 sessions, selected via purposive sampling to reflect diverse professional backgrounds and experiences with AI. The discussions explored attitudes toward AI, perceived training needs, ethical considerations, and barriers to adoption in non-formal education settings (Pawluczuk, 2023).

2.3 Framework Development

Insights from the desk research and qualitative data informed the co-design of the AI Competence Framework for Youth Workers. The framework was structured into four core domains:

[1] Technical foundations,
[2] Human-centred application,
[3] Ethical and legal reasoning,
[4] Societal and environmental contexts.

Each domain includes descriptors of specific knowledge areas, skills, and attitudes. This structure aligns with existing competence models for educators (Redecker, 2017; Vuorikari et al., 2022).

2.4 Validation Process

The draft framework underwent a structured validation process through a transnational online sur- vey. Respondents were invited to assess the relevance, clarity, and applicability of each competence descriptor using a five-point Likert scale. Quantitative feedback was complemented by open-ended responses. The validation sample consisted of 121 youth workers from across Europe. Descriptive statistics and thematic content analysis were used to synthesise the findings.

All procedures followed ethical standards for research involving human participants, including in-formed consent, anonymity, and voluntary participation (UNESCO, 2021).

Table 1: Summary of Research Phases and Participants.

Phase	**Description**	**Participants/ Sources**
Desk Research	Review of policies, strategies, and frameworks related to AI and youth education	EC reports, national strategies, SALTO, Dig-Comp, DigCompEdu, literature
Qualitative Field Research	Interviews and focus groups with youth professionals in 4 countries	68 youth workers and stakeholders
Framework Development	Synthesis of insights into 4 competence domains	N/A (design phase)
Validation Process	Online survey assessing framework relevance and clarity	121 respondents from across Europe

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3. Results

The research process yielded a set of key outputs that contribute both theoretically and practically to the digital transformation of youth work through Artificial Intelligence (AI). The findings are presented in three main areas:

[1] The validated AI Competence Framework
[2] The development of open educational resources
[3] The AI Training Toolkit

3.1 AI Competence Framework for Youth Workers

The core output of this work is a validated competence framework that defines the knowledge, skills, and attitudes required by youth professionals to meaningfully integrate AI into their practice. The framework is structured around four dimensions:

- Technical Foundations of AI: Competencies include understanding algorithmic processes, recognising bias in AI systems, and critically evaluating the outputs of AI tools.
- Human-Centred Application: This dimension highlights the use of AI to enhance participation, accessibility, and personalised engagement in youth work.
- Ethical and Legal Reasoning: Competencies encompass awareness of privacy, transparency, and fairness, in alignment with the EU Guidelines for Trustworthy AI (High-Level Expert Group on AI, 2018, 2020).
- Societal and Environmental Contexts: This area addresses the broader impacts of AI on employment, climate, and social cohesion.

Survey-based validation (N = 121) confirmed the framework's relevance and clarity. Over 85% of respondents rated the competence descriptors as "relevant" or "highly relevant," and open-ended feedback provided actionable suggestions for contextual refinement.

3.2 Digital eLearning Catalogue

To support the operationalisation of the competence framework, a multilingual Digital eLearning Catalogue was developed, consisting of 48 open-access educational resources. These include:

- Thematic learning modules on AI literacy and ethics
- Interactive case studies and simulations
- Learning games and assessment quizzes

All resources are aligned with the competence domains and designed for modular integration into existing non-formal training curricula (European Commission, Directorate-General for Education, Youth, Sport and Culture, 2022; Redecker, 2017).

3.3 AI Training Toolkit

The AI Training Toolkit provides practical support for youth professionals. It includes:

- A curated map of free online AI tools suited for youth work (e.g., tools for communication, content creation, personalised learning, and data analysis), each reviewed against EU ethical standards.

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- Fifteen ready-to-use AI-focused workshop templates, enabling youth workers to facilitate participatory learning activities with young people on topics such as generative AI, data privacy, and algorithmic bias.

Together, these outputs address a critical gap in the availability of structured, ethically grounded, and context-specific AI training resources for the youth sector (Lanzetta et al., 2024; Pawluczuk, 2023).

4. Discussion

The findings of this work highlight the critical importance of equipping youth professionals with AI-related competencies to address the widening gap between digital innovation and educational practice in non-formal settings. While the technological readiness of younger generations continues to increase—particularly with respect to generative AI tools—youth workers remain underprepared to respond to the pedagogical, ethical, and social challenges posed by AI integration (Holmes et al., 2019; Luckin et al., 2016).

The validated AI Competence Framework presented in this work constitutes a structured response to this gap. It demonstrates that youth work, traditionally centred on interpersonal support, empowerment, and social inclusion (Council of Europe, 2015), must now also address the complexities of digital citizenship and algorithmic awareness (Carretero et al., 2017; Vuorikari et al., 2022). The inclusion of ethical reasoning and social and environmental awareness within the framework acknowledges that AI competence is not merely technical, but deeply intertwined with values, equity, and systemic understanding—an approach increasingly endorsed in contemporary educational theory (Floridi et al., 2018; Pawluczuk, 2023; UNESCO, 2021).

Moreover, the high validation scores for the framework's relevance indicate a growing recognition within the youth sector of the need for systematic upskilling (Evrard et al., 2023; Lanzetta et al., 2024). Respondents' feedback also emphasised the importance of contextualised learning resources and practice-oriented tools—needs directly addressed by the Digital eLearning Catalogue and AI Training Toolkit developed in this project.

Importantly, this work supports the view that youth professionals must not be treated merely as end-users of AI tools but as active mediators who facilitate young people's critical engagement with emerging technologies. This is particularly vital given the complex emotional responses observed among youth workers in prior studies—from resistance and scepticism to curiosity and cautious optimism (Pawluczuk, 2023). Structured frameworks and accessible, localised training resources can help convert this ambivalence into confidence and agency.

From a policy perspective, the outputs of this work are well aligned with the objectives of the European Digital Education Action Plan and with the ethical principles articulated by the EU High-Level Expert Group on AI (European Commission, Directorate-General for Education, Youth, Sport and Culture, 2022; High-Level Expert Group on AI, 2018, 2020). However, institutional recognition and long-term investment in non-formal education are essential to scale such initiatives and ensure sustained impact (Council of the European Union, 2018; OECD, 2021).

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5. Conclusions

This work contributes to the advancement of digital capacity-building within the youth sector by developing a comprehensive and validated competence framework for the integration of Artificial Intelligence (AI) into youth work. Through a combination of desk research, qualitative inquiry, and transnational validation, the findings confirm the urgent need for structured, context-aware, and ethically grounded approaches to AI literacy among youth professionals.

The validated AI Competence Framework offers a practical model that encompasses not only technical knowledge, but also human-centred application, ethical reasoning, and awareness of the broader societal impacts of AI. The complementary resources developed—namely, the Digital eLearning Catalogue and the AI Training Toolkit—translate these competences into actionable learning interventions and practitioner tools, suitable for diverse non-formal educational settings.

One of the key implications of this work is that youth workers must be supported not only as users of AI technologies, but as facilitators of critical, inclusive, and empowering AI engagement for young people. The resources presented here provide a replicable foundation for future initiatives across Europe and potentially beyond, particularly in contexts where formal educational reforms may lag or exclude marginalised youth populations.

Nevertheless, certain limitations must be acknowledged. The scope of the empirical research was restricted to four European countries, and further validation in additional cultural and policy contexts is warranted. Future work should focus on assessing the long-term impact of the framework and training resources on both youth professionals and the young people they support. Moreover, integration with national qualifications and continuing professional development systems would enhance institutional uptake.

In conclusion, the AI4YouthWork initiative lays essential groundwork for a more resilient, informed, and ethically aware youth sector capable of navigating the AI-driven transformations of the 21st century.

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