

AI-supported counselor training for socio-ecological resilience

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Abstract. As higher education experiences rapid technological advancements, the integration of intelligent technologies and generative artificial intelligence into counselor training presents a practical approach to bridging the gap between theoretical knowledge and practical application, while also promoting environmentally sustainable, low-resource, paperless instructional methods. This research introduces an AI-enhanced instructional ecosystem for counseling psychology, which combines HeyGen to simulate therapeutic sessions, Canva for organizing and delivering interactive content, and ChatGPT combined with Designrr to produce customizable, digital workbooks. Prior studies suggest that embedding large language models within course design enhances transversal skills such as critical thinking, structured reasoning, and professional communication; avatar-based storytelling and simulations increase engagement, retention, and analytical depth in university contexts; and personalized digital workbooks support knowledge organization and higher-order cognitive processing. The evaluation used a design-oriented approach that examined workflow usability and material efficiency (e.g., paper savings) for the Canva-HeyGen-Designrr algorithm. Ecologically, the workflow explicitly prepares trainees to identify and address uncertainty-related eco-anxiety and climate distress through targeted simulations and structured reflective prompts, while its fully digital infrastructure reduces paper consumption by replacing printed vignettes, supervision materials, and journals with reusable electronic resources. The findings suggest that AI-supported, environmentally sustainable training can simultaneously enhance counseling competencies and promote sustainable educational practices, if the energy consumption associated with AI technologies is appropriately monitored and managed within program implementation.

Key words: counseling psychology education, simulation-based learning, generative AI, personalized digital workbooks, eco-anxiety, socio-ecological resilience, sustainable higher education.

Introduction

Bulgaria's contemporary risk landscape reflects a population continuously exposed to persistent environmental and infrastructural uncertainties. National statistics from 2021 to 2023 indicate approximately fourteen to fifteen thousand recorded hazardous events annually, resulting in hundreds of fatalities and numerous injuries. The dominant categories include technogenic, meteorological, hydrological, and climate-related incidents, which constitute a significant component of the country's risk profile. For instance, between

2021 and 2023, annual hazard events ranged from fourteen to fifteen thousand, with hundreds of deaths and thousands of injuries each year (e.g., 12,914 technogenic incidents in 2021 with 760 fatalities and 7,904 injuries; similar figures for subsequent years) (National Statistical Institute, 2025).

Concomitantly, water security presents a critical challenge. Analyses based on official audit reports and media sources reveal that roughly 4.5% of Bulgaria's population is subject to regulated water usage. Additionally, potable water reservoirs operate at an average capacity of appro-

ximately 68%, with physical losses in distribution networks estimated around 60%. The aging infrastructure, with an average age of 36 years, often results in extended water outages - lasting hours or days - in numerous settlements. These conditions have prompted audits and governmental reviews concerning drinking water availability amidst ongoing drought conditions, emphasizing the severity of the issue (Kirilova, 2025). In the Bulgarian context, anxiety related to uncertainty is increasingly rooted in tangible ecological and infrastructural instabilities, transcending individual psychological experience. This thematic focus - "anxiety under uncertainty" - has been explicitly integrated into the counselor training curriculum. Recent data on hazards and crises underscore that Bulgarian citizens face chronic exposure to biological, technological, meteorological, hydrological, and other ecological or anthropogenic risks. This is achieved through an AI-supported, low-material pedagogical ecosystem comprising simulated counseling encounters via avatar-based video interactions, digitally delivered psychoeducational content accessed via students' devices, and personalized AI-generated reflective workbooks. Pedagogically, this approach prepares students to competently support clients whose anxieties are grounded in real environmental instabilities - such as water insecurity, infrastructural deterioration, and cascading disasters - rather than abstract worries. Ecologically, it positions counselor training itself as a component of socio-ecological resilience. From a sustainability perspective, the methodology emphasizes a predominantly paperless workflow, significantly reducing printed supervision materials and hand-outs, thereby aligning professional training practices with environmentally responsible principles. Nonetheless, it remains transparent that AI systems entail their own energy and water consumption, necessitating ongoing management of their environmental impact. At a structural level, government expenditures on environmental safety have steadily increased from approximately 2 million BGN in 2018 to over 3 million BGN in 2022, reflecting heightened acknowledgment of ecological and infrastructural risks (National Statistical Institute, 2025). Collectively, these data portray a population living with chronic uncertainty concerning health, water access, physical safety, and the stability of their living environment and prospects.

Within this socio-ecological framework, higher education bears a dual responsibility. On one hand, to equip counsellors with the skills necessary to identify and address climate- and infrastructure-related psychological distress, on the other hand, to do so through educational delivery methods that minimize the material and energy consumption involved in training. The first responsibility is pedagogical and oriented toward public health, while the second is ecological. Emerging evidence at both macro (multi-country) and meso (organizational) levels suggests that advancements in artificial intelligence - through development and implementation - are linked to enhanced ecological performance via energy transitions and the promotion of greener innovations. Between 2018 and 2022, public expenditure designated for environmental safety has experienced an upward trend, based on data provided by the author from national accounts. This increase indicates that the state must allocate additional resources simply to sustain fundamental environmental security. From a clinical perspective, these tangible conditions tend to produce anxiety rooted in uncertainty - manifesting as concerns about household hygiene, housing stability, and the prospects of children - manifesting in counselling settings not merely as general worry but as eco-anxiety, anticipatory grief, and threat perceptions associated with infrastructural vulnerabilities (Wang et al., 2023, 2024; Lin et al., 2024; Hussain et al., 2024).

It is important to acknowledge that AI is not inherently environmentally sustainable. The environmental impact associated with AI-supported education encompasses significant electricity consumption and cooling water requirements at the data center level, along with hardware-related externalities. Consequently, the emerging field of "Green AI" emphasizes strategies such as energy-efficient model design, data-centric training approaches, and deployment methods - including federated and distributed learning - to ensure that the carbon and water costs of AI inference and training are justified by the educational benefits provided. These components coalesce around a pragmatic hypothesis for counsellor education. It's an instructional ecosystem supported by artificial intelligence and grounded in simulation-based learning, which is aimed at minimizing paper usage. It can simultaneously expand super-

vised practice opportunities centered on ecologically relevant cases (e.g., water insecurity-related distress) and to reduce the material footprint of training by eliminating reliance on printed vignettes, supervision packets, and physical reflection journals. In the current investigation, we operationalize this hypothesis and empirically quantify the material savings achievable under realistic cohort sizes (Savazzi et al., 2022; Bolón-Canedo et al., 2024; Wu et al., 2021). Simultaneously, evidences point that, in education specifically, AI-enabled, digitally delivered learning has been shown to enhance sustainability-relevant knowledge and dispositions while displacing paper-intensive routines with reusable digital assets (Henriksen et al., 2024; Arif et al., 2025).

This persistent state of insecurity fosters clinically significant anxiety - fear of systemic failure, anticipatory grief regarding intergenerational security, and a pervasive sense of threat linked to climate variability, infrastructure decay, and resource scarcity. These issues manifest directly within counseling settings, such as climate-related distress, eco-anxiety, and concerns about future stability. This paper adopts a principled stance emphasizing low-material pedagogical strategies, exemplified here through explicit accounting of paper savings, while simultaneously acknowledging and critically discussing the environmental costs associated with artificial intelligence (AI) and exploring feasible mitigation measures. The primary objective of this paper is to introduce and assess an AI-supported counselor-training workflow tailored to Bulgaria's current socio-ecological challenges. Specifically, we implement digital psychoeducational modules, AI-generated clinical cases, avatar-based simulation exercises, and individualized, editable workbooks designed to train responses to eco-anxiety rooted in uncertainty. We quantify the amount of paper conserved when students complete standardized counseling protocols electronically. The outcomes are interpreted within the frameworks of socio-ecological resilience - defined as human adaptive capacity in the face of environmental stress - and sustainable higher education delivery, with an emphasis on material throughput per learner.

Materials and methods

The instructional methodology implemented can be conceptualized as a closed digital feedback

loop that replaces the conventional paper-based practicum framework in counsellor education. Initially, essential psychoeducational content is developed using Canva and delivered exclusively through digital platforms. Instead of distributing printed lecture notes, crisis response guides, or supervision worksheets, students access structured instructional materials via their smartphones or laptops. These materials include conceptual frameworks, guidance for initial client contact, fundamental stabilization techniques, and ethical considerations relevant to intervention. AI-generated case scenarios are subsequently transformed into interactive simulations utilizing HeyGen. Rather than reading scripted scenarios and improvising responses in class, students observe simulated clients speaking in the first person, articulating their issues, emotions, and sense of urgency. The students' task is to analyse these interactions as if conducting an initial assessment session. Following each simulation, students receive a personalized digital workbook - created through a large language model and formatted in Designrr - which functions as an editable protocol. This digital document guides students to (a) clearly articulate the primary issue; (b) identify automatic thoughts, fears, and beliefs underlying the client's distress; (c) formulate an immediate support plan; (d) reflect on their professional role and limitations; and (e) identify areas requiring supervision. The examples (in Bulgarian) are shown in Fig. 1 (book cover of Narrative therapy course), Fig. 2 (Theoretical framework), Fig. 3 (Training worksheet), and Fig. 4 (Avatar base counseling example).

Unlike traditional supervision methods that rely on printed forms or handwritten journals, this process is entirely digital. Students complete the workbook on their devices, with the document serving both as a record of their reasoning and as a supervision tool.

Subsequently, authentic narratives derived from news reports and local accounts depicting individuals and families experiencing acute stress and insecurity - such as housing loss, concerns about hygiene and safety, and anxieties related to providing for children amid scarcity - are collected and analysed. These narratives serve as foundational material for constructing clinically plausible cases with the assistance of artificial intelligence.



Fig. 1. Book cover of Narrative therapy course made with Designrr.

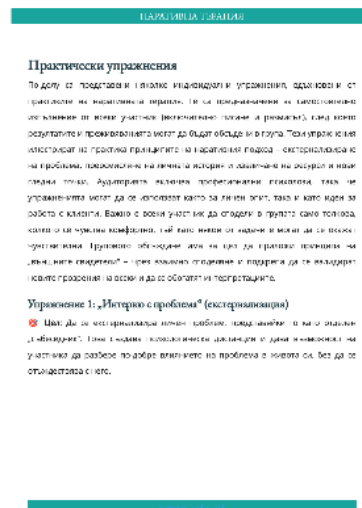


Fig. 2. Theoretical framework (made with Designrr and ChatGPT).

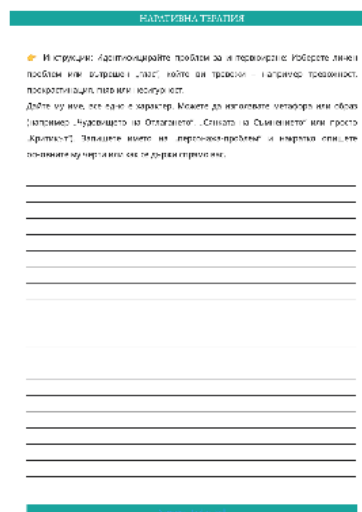


Fig. 3. Training worksheet (made with Designrr and ChatGPT).



Fig. 4. Avatar based counseling process (made with HeyGen and ChatGPT)

Results and Discussion

Students prompt AI systems to generate intake-style case descriptions, including details such as client identity, reported issues, personal descriptions of fear, the impact of the crisis on functioning, and available resources. This process results in comprehensive scenario descriptions in a structured format, like traditional printed case vignettes used in classroom role-plays. The process continues with a data collection phase, whereby students apply cognitive-behavioural and narrative techniques directly via their smartphones. They record automatic thoughts, reframe these thoughts into more adaptive alternatives, identify actionable behavioural steps, and craft alternative personal narratives - such as shifting from “I am failing” to a more constructive perspective.

From an analytical standpoint, this transition extends beyond superficial modifications, fundamentally preserving the essential pedagogical functions - such as case development, session observation, individualized workbook allocation, and reflection collection - while migrating them into a digital framework. Specifically, the methodology involves:

- employing artificial intelligence to produce authentic crisis scenarios, replacing traditional photocopied vignettes.
- Utilizing HeyGen to simulate session recordings accessible to students simultaneously, supplanting printed transcripts.
- Distributing digital, editable workbooks to students in lieu of physical supervision packets.
- Gathering reflections and formulations via students’ smartphones, thereby eliminating handwritten documentation.

This digital adaptation maintains the integrity of counselling training processes - students continue to conduct intake assessments, emotional evaluations, intervention planning, and ethical reflections - while all supervision artifacts are converted into reusable electronic formats.

A standard practicum protocol generally spans about four pages, including (1) an intake summary and primary concern, (2) a cognitive-behavioral formulation with intervention strategies, (3) narrative notes addressing meaning and ethical issues, and (4) supervisor inquiries or personal reflections. In conventional classroom settings, each student manually completes such a four-page packet for every client scenario, either by handwriting or utilizing printed templates. In contrast, our digital approach preserves this structure while replacing printed packets with editable electronic documents. This transition has quantifiable implications for resource consumption: assuming each simulated client encounter requires four pages, and students work through four distinct cases per day - a typical workload for skill development – the traditional method would generate 16 pages per student daily. When scaled to cohorts of 60 to 150 trainees, this translates to avoiding roughly 960 to 2,400 pages daily, or about two to five reams of paper per day, culminating in a total of 10 to 24 reams over a five-day program.

These figures underscore that, absent digital methods, such training would necessitate the printing, distribution, collection, and storage of extensive quantities of physical materials - tens of reams of paper within a single course. This discussion bears significance because traditional counsellor training typically involves generating physical documentation for each practice case.

Prior studies suggest that embedding large language models within course design enhances transversal skills such as critical thinking, structured reasoning, and professional communication (Michalon & Camacho-Zuñiga, 2023), avatar-based storytelling and simulations increase engagement, retention, and analytical depth in university contexts (Luprichová, 2025), and personalized digital workbooks support knowledge organization and higher-order cognitive processing (Monib et al., 2024).

Conclusions

This study describes an AI-supported, simulation-based, fully digital training ecosystem designed to enhance students' skills in case formulation, the mapping of theoretical frameworks to interventions, and professional self-reflection. Notably, the program explicitly prepares trainees to manage uncertainty-related eco-anxiety and climate-related distress. A key feature of the approach involves streamlining the workflow by replacing traditional printed vignettes and extensive supervision packets with editable digital protocols, thereby reducing approximately 16 pages of printed material per trainee per practice day. Extrapolated across a cohort of 60 students, this translates to a reduction of approximately 960 pages per day, and for 150 students, approximately 2,400 pages daily, culminating in savings of roughly 4,800 and 12,000 pages over a five-day training period, respectively.

The evaluation of this approach has several limitations. The study is confined to a single program and primarily relies on qualitative assessments, lacking randomized controlled designs or blinded rating procedures. The use of AI-generated cases may raise concerns regarding ecological validity. Additionally, the environmental impact of AI computation was not quantified, leaving the net ecological benefit unclear. Other potential limitations include the influence of novelty effects, issues related to access and accessibility in bring-your-own-device settings, and variability in supervision quality at scale, which may necessitate targeted live debriefs to ensure consistency.

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