



GenAI in education: What it means for teacher education

TE_REG Report 2 (WP2a2) Integrative Report on GenAI and Teacher Education

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Overview

This integrative report ‘GenAI in education: What it means for teacher education’ (TE_REG Report 2) builds on the exploratory report ‘GenAI in education: International frameworks and regional experiences’ (TE_REG Report 1), which mapped how GenAI is discussed and framed in relation to learning and teaching at international, European, and regional levels. ‘GenAI in education: International frameworks and regional experiences’ provides a descriptive overview of relevant documents and frameworks, offering a reference point for the reflections presented here.

The TE_REG project focuses on the rapid emergence of GenAI (as an external challenge to teacher education) which puts the internal challenge of the fragmentation induced by competency-based teacher standards sharply into focus. By addressing these intertwined challenges, TE_REG aims to develop a regenerative view on teacher education that responds to evolving societal needs. This report contributes to that ambition by exploring what GenAI implies for teacher education and by offering regionally grounded reflections and recommendations that might be instrumental for the development of the ‘TE_REG Manifesto’.

Focus groups were conducted in all regions (Finland, Flanders (Belgium), Hessen (Germany), Montenegro, and Portugal) with among the participants a diversity in professional roles (including teacher educators, (student) teachers, school leaders, and GenAI experts).

To manage the volume and complexity of materials, GenAI tools (ChatGPT 4.0 and Copilot) were applied to support document processing and synthesis. This use of GenAI as a tool for design was complemented by thorough review rounds with project partners to ensure factual accuracy and coherence.

2.1 Regional reflections from focus groups

The regional reports on GenAI and teacher education form an integral part of this overarching report. Each regional reflection is based on document analysis and structured discussions within focus groups. The reports provide insight into how GenAI is perceived, debated, and (where applicable) integrated into teacher education in the specific regions. What follows are introductory abstracts for each regional contribution.

Finland

Discussions in Finland highlight a cautious but open attitude toward GenAI in teacher education. Participants see GenAI as a potentially valuable tool e.g. in planning, differentiation, and language support, but they also voice concerns about possible effects on critical thinking, creativity, and teachers’ independent judgement. There is broad agreement that GenAI should support rather than replace professional decision-making. These views reflect a wider commitment among participants to preserve the human, value-conscious nature of teaching. GenAI literacy is recognized as essential, but it must be integrated in ways that uphold and strengthen professional autonomy and pedagogical responsibility. Controversies arise around the extent to which GenAI should be integrated into work with younger learners and the risk of over-reliance.

Flanders (Belgium)

In Flanders, participants express both optimism and unease. Many see GenAI as a source of inspiration and a practical tool for lesson planning and differentiation, but they warn against the risk of de-skilling and the erosion of professional autonomy. A broadly supported view is that GenAI integration requires clear frameworks that reaffirm the core role of teachers as critical, ethical professionals. Divergences appear in how much GenAI should contribute to the design and preparation phases of teaching. Open questions concern how teacher education can support collaborative learning cultures and define professional identity in an AI-rich world.

Hessen (Germany)

Reflections in Hessen are marked by both recognition of GenAI's practical benefits and concern about over-reliance. Participants agree that GenAI can assist in planning, differentiation, and feedback, but they stress that teachers need solid subject knowledge to critically assess AI outputs. A shared concern is the danger of over-reliance, which could compromise teacher autonomy. The relative lack of attention to ethical and data protection issues during discussions raises additional questions. Controversies revolve around how to balance efficiency gains with safeguarding educational values, while unresolved questions focus on how to adapt assessment practices and integrate ethics into teacher education curricula.

Montenegro

According to Montenegrin focus group contributors, in their country GenAI is currently being explored mainly at an individual level, with little systemic or institutional guidance. There is broad agreement on the need for national policies and ethical frameworks to provide clearer direction. Many express deep concern that, without critical oversight, GenAI may lead to superficial learning or undermine academic integrity. Several contributors emphasise the importance of fostering critical, ethical, and reflective capacities within teacher education. Open questions remain around how to support authentic student engagement in a GenAI-rich environment and how teacher education curricula might address the ethical, psychological, and pedagogical dimensions of AI.

Portugal

Participants in Portugal express cautious interest in GenAI, seeing opportunities for personalisation, differentiation, and administrative relief. A frequently voiced position is that GenAI should act as a partner or assistant, never replacing human judgement or teacher-student relationships. Concerns centre on over-reliance, bias, and inequity in access. There is widespread agreement that teacher education should integrate GenAI literacy, ethical awareness, and critical thinking, but practical strategies for doing so remain underdeveloped. Open questions include how to build training capacity and how to embed GenAI meaningfully into teacher education curricula without undermining core educational values.

The five abstracts offer a compact overview of how teacher education in the GenAI era is being reflected upon by teacher educators, students, and experts across regions. The full reports that follow invite closer reading and provide more in-depth perspectives, presented in alphabetical order.

2.1.1 Finland

[Insert the report here.]

<https://te-reg.eu/wp-content/uploads/go-x/u/9b1f9478-d836-41d3-9be0-5039abd925a7/University-of-Helsinki-Finland-GenAI-Reflections.pdf>

2.1.2 Flanders (Belgium)

[Insert the report here.]

https://te-reg.eu/wp-content/uploads/go-x/u/6555b5e5-d3d1-4d08-a0ec-cb80ac45095d/WP2a2-GenAI-ImplicationsForTeacherEducation-Flanders_REFLECTIONS_20250518.pdf

2.1.3 Hessen (Germany)

[Insert the report here.]

https://te-reg.eu/wp-content/uploads/go-x/u/3f123219-f136-4dbd-a755-20fd0e1c0930/WP2a2-GenAI-ImplicationsForTeacherEducation-Germanys_REFLECTIONS_20250427.pdf

2.1.4 Montenegro

[Insert the report here.]

https://te-reg.eu/wp-content/uploads/go-x/u/df077188-f92a-419d-94ea-829d494a511d/TE_REG-Report-WP2a2-Montenegro.pdf

2.1.5 Portugal

[Insert the report here.]

https://te-reg.eu/wp-content/uploads/go-x/u/8c6cb730-718b-47d5-862f-79b7b48ff2ca/WP2a2_Portugal_GenAI_EN.pdf

2.2 Conclusion

This final part of this report integrates insights from the five regional contributions presented here before and the findings and ideas discussed in ‘GenAI in education: International frameworks and regional experiences’ (TE_REG Report 1). In both reports, the focus is on the external challenge facing the teaching profession and teacher education today: the emergence of Generative AI.

Here, we look across the different regional reflections to identify shared concerns, recurring questions, and constructive ideas. Our aim is to prepare for what comes next: the development of the TE_REG Manifesto ‘Teacher Education Regenerated: an integrated view on Teacher Education in GenAI times’. This synthesis offers input for that manifesto. It helps us consider what matters, what is at stake, and what kind of choices need to be made. We will articulate a

number of position statements: points of orientation that express where we stand and what we want to take forward.

2.2.1 A basis taken as self-evident

Across all regions, certain themes surface again and again; in conversations, reports, focus sessions, policy documents, and academic texts. These are not necessarily conceptual baselines, but rather shared concerns and convictions: expressions of what many educators, students, and experts feel is at stake. They are voiced with sincerity, and they resonate widely. In that sense, they may form a kind of common ground, a shared bedding for engagement with GenAI in teacher education. At the same time, they remain open to questioning. Familiarity does not make them immune to scrutiny, nor does it close off the space for imagining what else might be possible.

Assertion 1: Teachers are irreplaceable.

GenAI can support but not replace the educational, relational, ethical, and context-sensitive role of teachers.

This widely shared and easily affirmed statement merits closer examination. Whether or not teachers are replaceable depends to a large extent on how we define teaching. If teaching involves generating explanations, designing materials, correcting language, drafting lesson plans, or producing assessment items, then many of these tasks can already be handled effectively by GenAI. In that sense, parts of what teachers have traditionally done can be replaced.

What this does not mean, however, is that the teacher becomes obsolete by default. Rather, opportunities arise to reconsider the teacher's distinctive contribution. If routine work can be delegated, more time and space become available for what requires human engagement: helping students think deeply, grapple with complexity, and find meaning in what they learn. Part of this lies in the relational dimension of teaching. Presence and immediacy – understood as psychological closeness, attentiveness, and the relational quality of teacher–learner interaction – affect how students engage with learning and relate to their well-being and motivation.

Teaching, in this view, becomes less about delivering content and more about creating conditions for intellectual and personal growth. What continues to matter – and arguably becomes even more visible in the age of GenAI – is the teacher's ability to foster trust, stimulate reflection, respond to the moment, and make ethical judgments in context. This involves a form of 'multisensorial registration' and 'contextual awareness': the ability to perceive and respond to what is happening in the room, drawing on subtle cues, lived experience, and an intuitive grasp of the broader context – including past dynamics, present tensions, and future possibilities. It reflects a mode of understanding grounded in presence, rather than in externally provided input or predefined data.

Assertion 2: Students need GenAI literacy.

Learners have to learn to question, interpret, and evaluate AI-generated content rather than consume it passively.

This call connects with a broader and long-standing educational tradition that emphasises critical engagement with information. What changes with GenAI is not the underlying goal, but the conditions under which it applies. GenAI literacy involves more than critical thinking in the traditional sense. It includes evaluating the content of individual outputs, but also understanding how they are produced, what assumptions or defaults shape them, and how they function within larger patterns of use. Critical engagement becomes part of a broader set of literacies that involve attention to process as much as to product: to how, why, and under what conditions something is articulated (written, said, drawn, shown...) by whom and/or by what.

While GenAI tools may generate incorrect or misleading content, this is not fundamentally different from the fallibility of human sources. People also make mistakes, spread misinformation, or rely on pedagogical methods that lack solid grounding – sometimes unintentionally, but at times willingly, from a position of authority or influence. The so-called ‘GenAI hallucinations’ may at times even be easier to detect than misleading information framed with rhetorical skill or social credibility. GenAI literacy, then, is not just about spotting technical errors, but about developing a situated awareness of how different sources – human or machine – shape knowledge and interpretation.

Assertion 3: Teachers need GenAI-training.

Both initial and in-service teacher education must include GenAI literacy, with attention to ethics, didactics, and subject-specific relevance.

GenAI intersects with key dimensions of teaching practice. It relates to subject matter, learning processes, classroom dynamics, and assessment routines. Understanding these connections requires more than technical familiarity (is not just another tool to be mastered). It involves reflection on how such systems shape the contexts in which teachers and learners interact.

Teaching is a profession shaped by context, judgement, and collaboration. GenAI is now part of that context, not as a separate topic, but as something that interacts with core aspects of educational practice (subject matter, learning processes, classroom dynamics, assessment routines...). Engagement with these aspects take meaning in specific settings and through collective interpretation.

Teachers engage with GenAI both individually and collectively. On the one hand, each teacher needs opportunities to explore tools, reflect on implications, and develop their own practice. On the other hand, much of the educational work around GenAI takes place in professional communities, where pedagogical, didactic, practical, and even managerial responsibilities are shared. In this perspective, GenAI literacy is not a checklist of individual skills but a capacity that develops through both personal learning and collective processes of reflection, experimentation, and dialogue across roles and disciplines. What this looks like in practice may vary, but working collectively on GenAI literacy seems to be a meaningful point of departure.

Assertion 4: Assessment needs to evolve.

Traditional assignments are no longer sufficient for evaluation; assessment relies on formats that foster authentic expression and cannot be outsourced to GenAI

Designing meaningful assessment practices requires time, dialogue, and attention to goals and context. It depends on multiple factors, including curricular frameworks, institutional expectations, and available support. There is no single model that fits all settings. The presence of GenAI does bring into focus the importance of aligning assessment with educational goals and settings. The evaluative implications of GenAI differ depending on the purpose of assessment.

Formatively, GenAI may support teachers in practical ways – by tracking individual progress, scanning classroom patterns, or identifying students who may need additional attention. These applications can reduce teachers' workload and create more room for the interpretive and context-rich aspects of formative work: understanding how learners relate to goals, content, and tasks, both individually and collectively.

In the context of summative assessment, GenAI exposes longstanding tensions. Evaluation practices have often centered on what is easiest to measure: factual recall, procedural fluency, and standardised formats. At the same time, questions have persisted about how to assess deeper forms of understanding, such as interpretation, analysis, and creative synthesis. The presence of GenAI does not create this challenge but makes it harder to ignore. Tasks that rely on surface-level processing no longer serve as reliable indicators of individual achievement. This shift may act as a pressure point to bring assessment practices more in line with the educational goals they claim to serve.

Not all traditional formats become obsolete, and not every open-ended task ensures meaningful learning or reliable evaluation. Relevance in relation to educational goals and clarity of expectations remain essential, regardless of form. At the same time, the presence of GenAI in education invites reconsideration of how assessment tasks are constructed and what kinds of engagement they call for. GenAI-tools may reshape the task itself, not by undermining its validity as a way of evidencing learning (e.g. an essay can still show interpretation and argument), but by shifting the terms through which such learning is expressed and evaluated (e.g. by placing emphasis on process evidence, oral explanation, annotated workflows....

2.2.2 New pathways for teacher education in the GenAI era

If we want teacher education to regenerate in light of the transformations brought about by GenAI – not just react or retrofit – we might want to move beyond the familiar. The following are not final answers, but tentative injections: new directions to explore, questions to bring into view, and challenges to engage with.

From tool to terrain: GenAI as context, not add-on

GenAI is not just a new tool to be integrated into existing routines. Given that it is primarily a new energy, a new force, it alters the conditions under which education (formal learning and teaching) unfolds – epistemologically, socially, and professionally. Rather than seeing it as a technical addition, it may be more accurate to think of it as a constituent of the environment in which education now takes place.

Such a perspective could open up new ways of thinking about teaching and teacher education – not as activities that simply incorporate GenAI, but as practices that are already shaped by it in various visible and invisible ways. GenAI literacy, then, is best understood as the capacity to navigate this new (educational) reality.

From competence to judgment: cultivating professional discretion

If GenAI can automate competence-based outputs (e.g. lesson plans, assessment rubrics, feedback templates), then teacher education is better served by focusing on capacities that cannot be automated and in which humans are – so far – uniquely positioned to excel: the teacher’s ability to work with the complexity of classroom life and to make context-sensitive judgments not fully captured by rules or standards, including pedagogical judgment, moral discretion, and the capacity to navigate uncertainty. Such capacities are not the easiest to acquire, yet they enable teachers to move learning beyond surface knowledge toward deeper and more lasting understanding.

From avoiding misuse to designing for meaning: increasing the educational ambition

Much of the current discourse is defensive: how to prevent plagiarism, detect AI use, or ban it in exams. Alternatively, the focus could be on the kinds of assignments that invite meaning-making through learning tasks that foster curiosity, ownership, and transformation, rather than mere compliance. GenAI can become an ally in this effort, but only when it is embedded in pedagogical designs that aim for depth and engagement.

From individual literacy to collective responsibility: acknowledging the limits of the individual

Calls for ‘GenAI literacy’ often focus on individual skills. An alternative or complementary emphasis could be placed on collective agency, fostering cultures of shared inquiry within teacher education. This might involve teacher teams, school communities, and peer groups that engage critically with GenAI together, not merely as users, but as co-shapers of educational purpose.

From domestication to transformation: allowing the power of GenAI

One of the early and understandable responses within teacher education has been to introduce GenAI as a separate theme (e.g. a dedicated session, module, or elective) positioned alongside topics like assessment, inclusion, or digital skills. While this offers a practical entry point, it may conceal the extent to which GenAI touches on deeper educational questions. Approaching it as an element that interacts with fundamental assumptions – about learning, about knowledge, about the role of education in society, about what educational institutions are preparing for – invites broader reflection. This kind of reframing shifts attention from GenAI as content to GenAI as a catalyst for re-examining the aims and orientations of teacher education, how it is structured, and what it takes to make it future-oriented.

Framing GenAI as a self-contained and easy to manage phenomenon may reduce it to a set of tools or isolated learning outcomes. Yet, its presence challenges more fundamental orientations, including how pedagogical judgement is exercised, how professional responsibility is shaped in relation to automation, and how teacher education engages with shifts in what counts as knowledge. Engaging with these questions does not imply rejecting all existing structures in advance, but it may invite collective inquiry and reflection on what those structures are meant to support.

This shift involves more than changes to content. It invites reflection on the frameworks through which teacher education defines its purpose. It creates space for experimentation, dialogue, and a willingness to revisit long-held assumptions in light of evolving conditions.