

Large Language Model (LLM) Development Programme

Understanding and working with generative artificial intelligence in academic research and higher education teaching

College of Education, Capital Normal University Beijing

November 2025

V1 (17-9-25)

Aims, content and concepts

The Programme, its aims and objectives

The LLM Development Programme for Capital Normal University, Beijing is being developed in response to the findings of recent research at CNU that members of staff were enthusiastically engaging with LLMs but in a relatively ‘weakly mediated’ environment (e.g. absence of institutional guidelines and GenAI support programmes). The proposed Programme to be delivered at the end of 2025 is designed to begin to fill this gap.

The Programme will be delivered over four weeks at the CNU College of Education, comprising two scheduled sessions each week. The Programme will be based on research-based inputs and, crucially, the harnessing and amplification of pre-existing knowledge and experience of members of staff and students in the use of LLMs.

The practical, theoretical and developmental objectives are to balance research-based inputs with participatory exercises to construct a creative dialogue with participants.

Practical

- Explore the opportunities/risks of using LLMs in the higher education environment and the importance of ethical working.
- Understand how LLMs work and the importance of prompt and context engineering to work with them optimally – context windows, agent building
- Discuss recent research on applying LLMs to academic research, including concepts of ‘cognitive offloading’ and developing higher order thinking and ‘orchestration’.
- Discuss recent research on applying LLMs to teaching in higher education, together with the foregrounding of participants’ pedagogical experiences to date,
- Develop a framework of university guidelines for ethical LLM partnership working.
- Explore how to collaborate with LLMs in cognitive partnership working and the development interdisciplinary thinking and working.

Conceptual

The Programme is informed by several key political-economy-ecology-technology concepts including understanding about:

- co-construction involving human and machine intellects and concept of the extended mind,
- the concept of building progressive layers of mediation, including the creation of ‘progressive technological organic intellectuals’ as key mediators,

- concepts of the technological general intellect and technological organic intellectuals,
- political-economy-ecology dimensions of GenAI, the role of geo-political competition between the US and China and the open-source movement,
- the technological trajectory of China and the potential contribution of CNU.

Research and teaching development

- the concepts of research problem spaces, compositional methodology and relational attribution in developing a personal research agenda,
- form an ongoing LLM 'community of practice' that will meet both physically and virtually.

Programme leads - Prof. Ken Spours, Distinguished Visiting Professor, CNU and University College London and Prof. Liying Rong, College of Education, CNU.

Target participants - academic staff from different disciplines and postgraduate students. The Programme will be advertised in October and staff and students can apply for a place (30 places?).

Duration - four weeks with two sessions weekly. Session 1 will be two hours and remaining seven sessions - 90-minutes. This initial programme will be followed by an online element.

An online global resource – with the permission of participants, the Programme will be filmed with the aim of becoming a global online resource, highlighting the innovative practices of CNU.

Week 1. 'Understanding' - foundational knowledge of LLMs and their challenges

Session 1. Navigating the new LLM frontier - opportunities, risks and ethical working

Objectives

Collectively explore the transformative potential of LLMs in higher education while critically assessing the associated risks and the necessity of ethical working.

Content & activities (two hours)

- *Participatory assessment of participant 'needs'* – collective articulation of participant needs and expectations.
- *Introduction to the Programme* – aims, objectives and key concepts.
- *Participatory activity* - discussion of the perceived LLM opportunities/risks.
- *Introduction to the LLM opportunity/risk landscape* – research-based input of the current evolution of LLMs, their adoption in global higher education and the 'opportunity/risk paradox'.
- *LLMs as 'tools' and 'intellectuals partners'* – from prompt engineering to context engineering
- *The concept of 'progressive mediation'* – moving beyond the simple acceptance/rejection of the new technologies with a proposal for a third path of 'progressive mediation' through educational programmes and ethical frameworks.

- The relationship of the concept of progressive mediation and the Programme.

Required Reading

Preparatory activity for Session 2

Session 2: Demystifying LLMs – from ‘black boxes’ to ‘white boxes’

Objectives

Demystify the core technical principles and features of LLMs, their recent evolution and moving from opaque ‘black boxes’ to transparent ‘white boxes’.

Content & activities (90 minutes)

- *How LLMs work* - a non-technical explanation of transformers, training data, and emergent capabilities and relationship between GenAI and LLMs (with support video, questions & discussion).
- *Technical Inputs* – including context windows and memory, agent building, Langchain and Retrieval-Augmented Generation (RAG).
- *The shift to multi-modality* - showcase examples of multi-modal LLMs and the movement from generative to agentic LLMs.
- *The black box challenge* - van der Schaar’s concept of moving from black boxes to white boxes.
- *Input and activity on prompt and context engineering*
- *Participative activity* - case study discussion of a recent research paper on multi-modal LLMs and discuss the implications for research and teaching.

Required reading

Preparatory activity for Session 3

Week 2: ‘Application’ - partnering LLMs in academic research and teaching

Session 3: Using LLMs in academic research

Objectives

Discuss practical applications of LLMs in the research lifecycle, from literature review, data analysis to relational attribution.

Content & activities

- *Introduction to the idea of researcher/LLM ‘co-construction’.*
- *Literature review with LLMs* – input and discussion of how to use LLMs for summarization, synthesis, and identifying key themes in a corpus of texts.

- *Research design and data analysis (activity)* - participants bring a research problem and work in groups to brainstorm how LLMs could assist in the methodology or analysis phases.
- *Ethical considerations* - discussion of bias, data fabrication and the role of human oversight and verification and the concept of 'relational attribution'.
- *Creating LLM methodological explanations (preparatory exercise for Session 4)*.

Required reading

Preparatory activity for Session 4

Session 4: Using LLMs in higher education teaching

Objectives

Explore how LLMs can be used to augment teaching practices and enhance student learning outcomes.

Content & activities

- *LLMs as pedagogical tools* - explore the use of LLMs for generating lecture outlines, creating formative quizzes, providing personalised student feedback, and designing adaptive learning pathways.
- *Curriculum development (activity)* - participants work in groups to re-design a module or course and integrate LLM-assisted teaching activities.
- *Assessment and academic integrity* - discuss strategies for designing LLM-resistant assessments and developing a culture of responsible AI use.

Required Reading

Preparatory activity for Session 5

Week 3. 'Conceptual reflections' – applying cognitive and political-economy-ecology frameworks to GenAI

Session 5: Cognitive partnership working with LLMs

Objectives

To understand and practice working with LLMs as a form of cognitive partnership, enhancing human intellectual capabilities rather than replacing them.

Content & activities

- *Prompt Engineering* - practical workshop on advanced prompting techniques for academic and teaching tasks.

- *Distributive cognition* - discuss the theory of distributed cognition and how LLMs fit into a network of human and non-human agents that share knowledge and solve problems, with a focus on how this can enhance or diminish critical thinking.
- *Relational Attribution* – recognising the contribution of the machine in academic writing.
- Explore the ethical implications of attributing human-like qualities and agency to LLMs and the challenge of psychological and emotional dependence.
- *LLMs and current attitudes in the global academic community* -

Required reading

Preparatory activity for Session 6

Session 6: Political-economy-ecology reflections on Generative AI

Objectives

Critically analyze the geopolitical, economic and ecological dimensions of GenAI in the Chinese context.

Content & activities

- *US-China competition* - discuss the strategic competition between the US and China for technological leadership, exploring topics like technology transfer, GPU sanctions, and national AI strategies, including China's "bottom-up" provincial incentives and "top-down" national curriculum reform.
- *Radical ideas about open source* and the importance of the 'DeepSeek moment' of early 2025.
- *Introduce the idea of technological organic intellectuals* in the context of China's mission for global parity and ethical leadership.
- *Debate/discussion (activity)*: A structured debate on the role of universities in navigating this geopolitical landscape, focusing on remaining academically open while contributing to national technological goals.

Required reading

Preparatory activity for Session 7

Week 4. 'Creating and building' – developing institutional and personal capabilities

Session 7. Developing LLM ethical guidelines for CNU as a new LLM problem space

Objectives

To begin the collaborative process of drafting institutional guidelines for the use of LLMs at CNU.

Content & activities

- *International and national best practices* - review of recent ethical guidelines from universities in China and globally.
- *Discussion and brainstorming (activity)* – working in small groups, participants work to create a draft of core principles for CNU's LLM policy, considering topics like academic honesty, data security, and pedagogical innovation.
- *Focus on the CNU context* - applying the mission and values of CNU to the draft guidelines.
- *Introduction to the concepts of Problem Spaces and Compositional Methodology*

Required Reading

Preparatory activity for Session 8

Session 8: Creating personal LLM development plans and a LLM community of practice

Objectives

Consolidate the Programme's activities and findings, introduce the idea of personal LLM development plans and the formation of a LLM community of practice.

Content & activities

- *Future roadmap* - discuss the next steps for CNU, including the potential for a dedicated LLM working group/community of practice, the implementation of pilot programmes, and ongoing professional development.
- *Concluding discussion* - final reflections on the role of LLMs as a tool for intellectual empowerment within the academic community.
- *Creating personal LLM development plans.*
- *Forming a LLM community of practice.*

Follow-up - a LLM community of practice and a globalised CNU resource

Following the November 2025 Programme there could be two follow-up developments.

- The formation of a physical and online LLM community of practice (COP)* to serve as a repository for programme materials, a forum for sharing experiences and research, and a space for the continued refinement of CNU's LLM guidelines. Participants will be encouraged to post articles, share their own research findings, and continue the dialogue on topics of mutual interest.
- The 2025 CNU LLM Development Programme as an online global resource.*