Programme Documentation of the research programme ‘AI-driven knowledge production’: Research Programme Architecture and Positioning.



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1. Purpose of this document

AI-Driven Knowledge Production is a research programme consisting of five linked dissertation-scale studies. Four studies examine substantially different modes of scientific inquiry; the fifth is a reflexive meta-study in which both the resulting research artefacts and aspects of their production histories become research material.

This document provides a concise account of the architecture of that programme and positions it in relation to relevant work on AI-generated scientific writing, autonomous research systems, human–AI research collaboration, curatorial authorship, provenance and synthetic scholarship.

It is not intended as a substitute for the dissertations or their accompanying Methodological Reflection Reports. Nor does it provide condensed chapter-by-chapter summaries. Separate volumes containing the Management Summaries of the five dissertations and of the five Methodological Reflection Reports serve those purposes.

The narrower purpose here is to clarify three matters: what was held constant across the five studies; why substantially different forms of scientific inquiry were included; and which aspects of the resulting programme have clear precedents and which aspects of their combination appear, on current evidence, to be distinctive.

2. Research question and programme architecture

Study	Research mode	Principal methodological function within the programme
Polyglot Learning in the AI Era	Design-oriented research	Tests AI-assisted development and large-scale operationalisation of a complex educational design. The empirical thirteen-week learning programme has not yet been conducted; the study therefore remains empirically unfinished.
Governing within Biological Boundaries	Interpretative / anthropological and public-administration research	Tests cross-disciplinary theoretical synthesis, interpretative argumentation and the risk that generative systems strengthen an initially plausible explanatory framework beyond its evidential basis.
AI-Driven Knowledge Production	Comparative and reflexive meta-research	Compares the cases and examines the changing division of labour between researcher and AI. Its own production process constitutes an additional reflexive case.
The Promises of Digital Revolutions	Historical-analytical research	Tests source-based reconstruction, repeated application of analytical frameworks, temporal reasoning and the

Study	Research mode	Principal methodological function within the programme
		distinction between historical evidence and retrospectively coherent interpretation.
Columba Loquens	Natural-science boundary case	Tests scientific plausibility and provenance under deliberately synthetic conditions. No pigeon experiments were conducted and the reported empirical datasets were synthetically generated.

The studies are consequently not five replications of the same experiment. They differ in object, evidence structure, method and status. The comparative logic lies precisely in those differences.

The substantive summary volume accordingly describes the programme as four domain-specific studies representing design-oriented, anthropological/public-administration, historical and natural-scientific research, together with an overarching meta-dissertation.

3. Functional separation within the research process

During the programme, the use of language models evolved from relatively general assistance towards more differentiated production architectures.

Where possible, generation, criticism and verification were organised as separate functions. A model used to draft or revise material was not automatically treated as an adequate evaluator of that same material. Other model instances or systems could be assigned adversarial review, source criticism, bibliographic checking or targeted verification tasks, while the human curator determined which criticism required action and whether the resulting material was acceptable.

The specific model assigned to a function was less important than the functional separation itself. Across different studies, ChatGPT, Claude and Gemini performed different roles; in some cases the allocation of generative and critical functions was reversed. The methodological principle was therefore organisational rather than model-specific.

This distinction became important because the programme repeatedly exposed an asymmetry between production and verification. Generative systems could produce and reorganise material much faster than a human researcher could independently verify it. Increased productive capacity therefore did not remove the need for human academic labour. It changed its location.

The recurrent human tasks increasingly concerned problem formulation, preservation of conceptual distinctions, selection, judgement, source evaluation, organisation of verification and deciding what could ultimately be defended.

4. Why a cross-paradigm design?

Much current work on AI-enabled research investigates performance within a single scientific domain or within computational research environments that are particularly amenable to automation. Such work is essential, but it cannot by itself establish how generative AI behaves under substantially different epistemic conditions.

The pentalogy therefore uses disciplinary heterogeneity as an analytical device.

A design-oriented study requires the transformation of abstract principles into a functioning intervention or artefact. Interpretative research places greater weight on conceptual framing, synthesis and the treatment of ambiguity. Historical research requires temporal discipline, source criticism and resistance to hindsight. Natural-science research foregrounds empirical provenance, measurement and the relation between data and claims.

Generative AI does not encounter the same quality problem in each of these environments.

The cases consequently produced different failure modes. Among those documented were semantic drift during repeated generation, narrative over-coherence, instability during recursive revision, unreliable references, the tendency of plausible synthesis to outrun evidential support, and the difficulty of maintaining complex design constraints across large volumes of generated material. The accompanying Methodological Reflection Reports reconstruct these failures, interventions and verification procedures rather than treating the final manuscripts as the only evidence generated by the programme.

This cross-paradigm comparison is exploratory rather than experimental in the narrow controlled sense. The studies were developed sequentially, their architectures differ, and they do not constitute a standardised benchmark in which a single independent variable was manipulated while other conditions were held constant.

Their value instead lies in exposing the same broad human–AI division of labour to different forms of scientific work and examining which opportunities and vulnerabilities recur and which remain domain-specific.

5. What the programme does — and does not — claim

The programme provides evidence that generative AI can perform a considerably larger range of tasks within academic research than text completion or linguistic editing alone. Within the cases examined, language models contributed to conceptual exploration, synthesis, drafting, criticism, revision, verification and the construction of research materials.

The programme also suggests that increased generative capacity creates its own control problem. Fluency, internal coherence and apparent scholarly form are not sufficient indicators of evidential validity. In several cases, the more convincingly a language model could elaborate a line of argument, the more important independent criticism, source control and human judgement became.

The resulting methodological proposition is therefore not that scientific quality can be delegated to a language model. It is that the architecture within which model output is produced, criticised, verified and accepted becomes an increasingly important determinant of research quality.

At the same time, the programme does not establish that the same division of labour will be appropriate across all disciplines, that AI-generated research is intrinsically superior to conventionally produced research, or that the observed production speeds can be generalised to ordinary doctoral trajectories.

Nor are the five manuscripts equivalent in empirical status. *Polyglot Learning in the AI Era* remains empirically unfinished, while *Columba Loquens* is a deliberately synthetic boundary case rather than a contribution to empirical knowledge about pigeon cognition. These distinctions are material to any evaluation of the programme. The summary documentation makes them explicit.

6. Documentation and auditability

An unusual feature of the programme is that the resulting manuscripts are not the only preserved research objects.

Each dissertation is accompanied by a Methodological Reflection Report documenting its development, division of human and AI roles, production problems, corrective interventions and reliability measures. The documentation includes successive versions, interaction histories, model assignments, curatorial decisions, critical interventions and verification procedures. In several cases, production, criticism and verification themselves became objects of investigation.

This does not make the programme automatically reproducible in the conventional experimental sense. Generative models are probabilistic, model versions change and substantial parts of the work were conducted through proprietary systems.

The documentation serves a different purpose: **auditability**. It makes it possible to examine not only the final claims and texts, but also how those claims acquired their final form and where human judgement entered the process.

The substantive and methodological Management Summary volumes provide complementary condensed access to these two layers. The complete manuscripts, Methodological Reflection Reports and supporting programme documentation are publicly available through the project website.

7. Positioning against existing work

7.1 Scope of the precedent analysis

None of the principal components of the programme should be assumed to be novel in isolation.

Machine-generated scientific text predates the programme. Human researchers have already delegated substantial writing to language models. Autonomous and multi-agent systems can perform literature review, hypothesis generation, experimentation, analysis and manuscript production. Other work has developed models of human curation, provenance logging, synthetic scholarship and AI-led scientific workflows.

The relevant question is therefore not whether the programme contains elements for which precedents exist. It plainly does.

The question is whether a directly comparable configuration has previously been publicly documented: ***a linked series of dissertation-scale studies across substantially different modes of scientific inquiry, conducted under a consistent human-curator/AI-producer division of labour, with preserved production and verification histories and a reflexive meta-study in which those histories themselves become research material.***

The following register is intended as a selective positioning exercise rather than an exhaustive systematic review. It covers publicly accessible scholarly and institutional sources examined up to 28 September 2026. Absence from the register does not establish absence from unpublished research practice or from literature not identified in that search.

7.2 Living Precedent Register

Precedent	Principal overlap	Principal difference
Beta Writer, Springer (2019)	Book-length machine-generated scientific text	Automated synthesis of an existing literature rather than an original linked research programme; no comparable cross-case curatorial and audit architecture identified
Luciano Floridi — "Distant Writing" (2025)	Human designer combined with substantial machine text production	Primarily conceptual and philosophical; not a dissertation-scale comparative empirical programme
Rodrigues — Apt Curation Model (2026)	Close conceptual parallel with human-as-curator and delegated AI writing	A model of authorship and curation rather than a linked set of completed research cases
Agent Laboratory (2025)	Human supplies the research idea; AI performs literature review, experimentation and report generation, with human feedback possible	Computational pipeline and paper/report scale; no comparison across substantially different epistemic traditions

Precedent	Principal overlap	Principal difference
Stanford Virtual Lab (2025)	Multi-agent scientific team operating under human direction on genuine research problems	Concentrated in a biomedical domain; no dissertation-scale cross-paradigm programme or reflexive meta-design
Stanford Agents4Science (2025)	AI designated as primary author and used extensively for hypothesis generation, experimentation and writing, with disclosure of human involvement	Short computational papers within a conference experiment rather than a longitudinal dissertation-scale programme
SciSciGPT (2025–26)	Human–AI research collaboration and preservation of complete interaction histories in some cases	Science-of-science applications rather than dissertation-scale research across contrasting scientific paradigms
Sakana AI Scientist (2024–26)	End-to-end autonomous research cycle including idea generation, experimentation, analysis, manuscript production and review	Primarily machine-learning/computational research; paper scale; substantially different human role
Google Science One (2026)	End-to-end research combined with explicit evidence provenance and claim verification	Computational research framework rather than dissertation-scale comparison across different forms of scientific inquiry
Hashem et al. — Synthetic Scholarship (2026)	AI-generated research including synthetic data, with emphasis on auditability rather than detection	Single mixed-methods study rather than a linked longitudinal programme
Holtermann (2025)	Self-reported dissertation-scale works produced with entirely AI-generated academic text under human prompt direction	No comparable cross-paradigm programme or documented research architecture identified; the reported defence claims had not been independently confirmed through primary university records at the time of this review

Thus, the existing register contains substantial precedents for virtually every individual component of the research programme.

8. Current positioning

On the basis of the publicly accessible material identified up to 28 September 2026, no directly comparable programme has been found that combines all of the following characteristics:

comparative research across different epistemic regimes; dissertation-scale outputs; a consistent separation between AI textual production and human scientific responsibility; functional differentiation between generation, criticism and verification; preservation of extensive production histories as audit material; and a reflexive meta-study in which the resulting research artefacts and their production processes jointly become case material.

This is a claim about the *combination and research architecture,* not about priority for its individual components.

Accordingly, the appropriate current formulation is: 'No directly comparable publicly documented programme identified as of 28 September 2026'.

That formulation is deliberately narrower than a claim of being the first or unique programme of its kind. New precedents should alter this positioning whenever they materially change the comparison. The precedent register is therefore intended to remain a living document rather than a fixed priority claim.

9. Research material

The programme is documented at three levels.

The five dissertation manuscripts contain the substantive research products. Their five Methodological Reflection Reports reconstruct the processes by which those products were generated, criticised, revised and verified. Two consolidated Management Summary volumes provide shorter access respectively to the substantive and methodological layers.

The full publicly accessible research corpus is available at: **https://research.cyber-busters.com**

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