ChalkboardAI

Classic Teaching, Smarter Tools

A Privacy-First Approach for AI-Augmented Classroom Practice

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1. Executive Summary

Teachers in UK schools — and in many countries worldwide — are facing intense pressure. The retention and recruitment crisis is well documented, and workload remains the central reason. Yet most AI tools are built around content, not classrooms, and offer little transparency. Management Information Systems (MIS) systems are rigid; administratively burdensome, and not designed for support planning. There is a clear gap where secure, genuinely time-saving tools should be. Teachers don't have time to trial tools that fail on first use; produce generic output; add to workload, or raise GDPR concerns. They need tools that work with them from day one: tools that are practical, reliable, and secure.

The ChalkboardAI Approach aims to meet each of these worries head-on. It has been conceived from the beginning as a data-secure, GDPR compliant eco-system of tools. Founded by a teacher with 10 years' experience working in UK primary schools, every tool is designed to solve a headache, or streamline a workflow. These tools are not generic or superficial. Each one is designed to address a specific, high-friction problem in a teacher's day. They have the potential to become a teaching companion through which teachers can confidently use their own anonymised data; gain insights into their classes, and recover precious time to allow them to do what they do best: deliver excellent lessons for the children they care about.

This document lays out the ChalkboardAI Approach; the system architecture underpinning it, and the proposed framework for piloting a privacy-first AI suite in UK primary schools.

2. What is ChalkboardAI?

ChalkboardAI is a privacy-first system that allows teachers to use AI safely, efficiently, and in line with UK GDPR. It is not a single tool, but a unified approach: a secure local data record, an automatic anonymisation layer, and a suite of focused classroom tools that sit on top of both.

At its simplest, ChalkboardAI works like this:

1. The teacher maintains one local class record on their device — a digital notebook containing the information they already keep throughout the year (needs, strengths, interventions, attainment notes, seating constraints, etc.).
2. When a ChalkboardAI tool is opened, this record is loaded into a temporary workspace in the browser — never uploaded, never stored externally.
3. Before anything is processed, all real names are automatically replaced with pseudonyms.
   The teacher does not need to remember to anonymise: it happens by default.
4. Only the specific data required for the task (e.g., grouping, timetabling, report writing) is extracted, anonymised, and sent to the AI.
5. The AI produces an anonymised draft, which is then reidentified locally on the teacher's device.
   No real names ever reach the model.

The result is a set of practical tools that genuinely reduce workload while meeting high standards of privacy, transparency, and professional control.

2.1 What ChalkboardAI Tools Do

ChalkboardAI is designed around real classroom jobs that consume teacher time. Each tool uses the same local class record and the same privacy layer, so teachers avoid duplicated data entry and repeated exports.

Current and emerging tools include:

- Groups – builds targeted intervention, project, or mixed-ability groups from anonymised needs, strengths, and constraints.
- Rota – creates support timetables using anonymised pupil profiles and the school's curriculum schedule.
- Reports – drafts personalised report sections based on anonymised attainment data, needs, and teacher notes.
- Provision Mapper – produces termly SEND provision maps aligned with pupil needs and school-level requirements.
- Parents' Evening Notes Generator – creates structured, anonymised meeting summaries tailored to each child.
- Chalkboard Coach *(future module)* – a safe, anonymised pupil-facing AI assistant designed to support metacognition, reflection, and learning conversations without ever revealing or storing identifiable data.

These tools share one purpose: to give teachers high-quality, secure, time-saving support without increasing workload or compromising compliance.

3. Why This Paper?

AI is moving faster than school systems, policy frameworks, and safeguarding standards can keep up with. Over the last eighteen months, UK schools have seen a rapid increase in the use of large language models (LLMs) by teachers, pupils, and commercial edtech providers. Yet despite this acceleration, there is still no agreed approach for using AI safely, transparently, and in a way that aligns with the realities of classroom practice and the legal responsibilities schools carry under UK GDPR.

At the same time, a growing number of AI-powered tools are being marketed to schools with little clarity about data protection, privacy controls, or the risks associated with model hallucinations. Teachers are being asked to integrate technologies that were not designed for education, and which often place the burden of compliance on the end user. This creates a gap between what the technology currently offers and what schools can responsibly adopt.

This White Paper is not a product pitch. It is an attempt to define a practical, privacy-first approach for safe AI augmentation in UK primary classrooms — an approach informed by real workflows, real constraints, and real professional duties. It is written from the perspective of a practising teacher who has spent a decade working within these constraints, and who has experimented extensively with AI to understand both its potential and its risks.

The ChalkboardAI Approach outlined in this document is early-stage. Like most emerging frameworks, it is evolving, and it will continue to develop through research, pilot studies, and collaboration with teachers, senior leaders, data protection officers, and technical experts. But the foundational principles — local-first data handling, automatic anonymisation, contextual minimisation, transparent prompt architecture, and human-in-the-loop safeguards — are stable, well-defined, and urgently needed.

This paper is offered as a starting point for discussion. Its purpose is not to present a finished system, but to articulate a clear, responsible, and professionally grounded approach to AI that schools can evaluate, challenge, refine, and — where appropriate — adopt. In an area where many tools are being built without reference to classroom reality, this approach aims to put teaching, ethics, and privacy first.

4. Why ChalkboardAI is needed

4.1 The workload crisis

The teaching profession is in the midst of a well-documented recruitment and retention crisis[1]. Stakeholders across the sector — including the DfE, teaching unions, and leading commentators — agree that workload is a major driver. This is not the fault of any one government or employer; teaching is demanding work and accountability is an essential part of the system. Despite initiatives such as the DfE's 'Reducing School Workload' collection[2] and the NEU's guidance on unnecessary administrative tasks[3], teachers' workloads continue to rise. Increasing SEND needs, tighter Ofsted expectations, widening attainment gaps, and growing administrative and pastoral demands all compound the pressure. The result is a profession struggling to sustain itself — and a system searching for solutions that genuinely reduce workload without compromising quality, equity, or safety.[4]

Much of a teacher's day-to-day work is essential: delivering a creative and engaging curriculum; keeping the children in their class safe; meeting their diverse needs; and securing progress for every pupil. These are the core responsibilities set out in the Teachers' Standards, and they rely on a teacher's training, experience and insight. However, each of these responsibilities carries a heavy administrative burden — and this is a key driver of the workload crisis.

Intervention planning, provision mapping, SEND documentation, safeguarding logs, parents' evening preparation, and comprehensive end-of-year reports are all examples of invisible time sinks. While these tasks must be completed to a high standard, much of this work does not, and should not, require a trained teacher to spend countless hours completing. Teachers' time is most valuable when it is spent preparing excellent lessons and engaging with their pupils — yet these tasks continually compete for that time. This tension is reflected in the fact that workload is cited by 90% of teachers who leave the profession.[5]

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[1] The failure to recruit and retain teachers | National Education Union
[2] Reducing school workload - GOV.UK
[3] Administrative and clerical tasks | National Education Union
[4] How we're reducing teacher workload – The Education Hub
[5] Teacher Labour Market in England Annual Report 2025 - NFER

Meanwhile, the current edtech market is awash with AI tools that act largely as wrappers for existing large language models. They promise time savings by generating model texts or drafting lesson plans — solutions to the visible drags on teachers' time. But this approach misunderstands the reality of teaching in 2025. A lack of time to plan lessons is not the problem itself; it is a symptom of a deeper workload crisis. This is the problem the ChalkboardAI Approach is designed to address.

4.2 Why current AI solutions fail schools

In the last 3 years, large language models have become part of the national conversation. It's an increasingly clear fact that the AI revolution will change the way that we live and work.[6] What is not yet clear is how this will be implemented in education.

Tools that already exist are useful in their way, but they ignore many of the legitimate concerns and questions that schools have.

The primary concern in the UK is that of data security and GDPR compliance. Schools operate under strict legal duties set out in UK GDPR and the Data Protection Act 2018[7], which include potential fines of up to £17.5 million (or 4% of annual turnover, whichever is higher), if they breach these regulations.[8] Yet current AI tools do not protect teachers from commiting accidental data breaches. In fact, by ignoring a simple reminder (for example, 'Remember, don't use real names!'), it is possible to use these tools with full names and sensitive data, with no obvious repercussions. This is not compliant with GDPR, and it puts too much burden on the teacher to be a GDPR expert.

A second concern is the problem of AI hallucinations.[9] Current LLMs are designed to synthesise human creativity, not verify facts, and this often leads to innacurate or misleading output. In education – where schools work with sensitive data and real people – this is not a minor inconvenience. It can undermine trust, create safeguarding risks, and introduce errors

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[6] AI: 3 ways artificial intelligence will change the future of work | World Economic Forum
[7] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data (United Kingdom General Data Protection Regulation) (Text with EEA relevance)
[8] Penalties | ICO
[9] A Survey on Hallucination in Large Language Models: Principles, Taxonomy, Challenges, and Open Questions

into planning and assessment. The current market offers no AI tool that meaningfully mitigates or flags hallucinations for the education context.

Many existing tools also target the most expertise-rich parts of a teacher's role: planning, assessment, and reporting. This raises an important question. Should we be outsourcing the core professional judgement of teaching to systems that do not know the pupils, their needs, or the school's context? Outputs often remain generic because these systems cannot work with real pupil data without breaching privacy.

Teachers recognise these risks, but they also do not have time to craft complex prompts or build bespoke workflows to correct them. They are caught between rising workload; the limitations of current AI systems; and the constraints of data-protection law. The result is a market full of tools that promise to help—but which do not align with the operational realities or legal responsibilities of schools.

4.3 The gap

The gap between what is currently available and what teachers need is clear and easily stated.
Teachers need tools they can trust.

Trust is created when tools are genuinely data-secure; when they work the first time and every time, and when they solve real problems without adding new risks or workload.

ChalkboardAI addresses this gap with a single, coherent approach: a privacy-first methodology for AI-augmented workflows, designed by a practising teacher and grounded in the everyday realities of the classroom.

5. Core Philosophy: Privacy-First AI by Design

The ChalkboardAI Approach is grounded in six simple principles that ensure AI tools are safe, trustworthy, and classroom-ready. These principles are intentionally practical: they describe what teachers require, what GDPR demands, and what current tools fail to provide.

5.1 Principle 1 — Local-first data handling

All identifiable pupil data stays on the teacher's device. Nothing leaves the teacher's machine until it has been anonymised and made GDPR compliant. There are safeguards in place to ensure that teachers cannot unknowingly transmit sensitive data to anonymous servers. This removes the burden of GDPR compliance from the teacher and places it on the tool.

5.2 Principle 2 — Automatic anonymisation at tool inputs

Before any text is sent to an AI model, names are automatically replaced with pseudonyms. This removes the need for teachers to police their own inputs or remember, 'don't paste real names' warnings. Crucially, anonymisation-by-default makes safe behaviour the path of least resistance, not an extra responsibility. It ensures compliance even when teachers are under time pressure.

5.3 Principle 3 — Contextual minimisation

Teachers maintain a single Chalkboard Class Record that lives on their device. When a tool runs, it requests only the specific fields it needs from that record, using a predefined 'required data profile'. The system extracts this minimal subset locally, before any pseudonymisation or processing occurs. Only this reduced dataset is then anonymised and sent to the AI.

The platform never requests additional personal data beyond the Chalkboard Class Record, and it never enriches or combines the Chalkboard Class Record with external sources. In practice, this eliminates repeated data exports and ad hoc spreadsheets while ensuring that every workflow remains tightly scoped to the minimum anonymised context needed to perform the task effectively.

5.4 Principle 4 — Reidentification happens locally

The AI's output is received in anonymised form and converted back to real names on the teacher's device. At no point does the model see real identities, even indirectly. This protects pupils, strengthens compliance, and prevents the model from building up inferred profiles across sessions. It also guarantees that any saved output (e.g., reports, timetables or rotas) is safe from end to end.

5.5 Principle 5 — Human-in-the-loop

Teachers remain the final decision-makers. The AI provides draft suggestions, but the teacher reviews, edits, and approves all outputs. This preserves professional judgment, prevents over-reliance, and ensures that AI augments rather than replaces teacher expertise. It also addresses the risk of hallucinations by building validation naturally into every workflow.

5.6 Principle 6 — Transparent reproducibility

Every tool shows exactly what was sent to the AI, and what the AI produced in return. Each operation generates:

- the anonymised prompt used,
- metadata describing the process.

This transparency builds trust, supports auditability, and helps schools meet statutory obligations to understand and evidence how data is used. It also enables teachers to learn, refine, and feel confident in the system.

6. System Architecture

The ChalkboardAI Approach is not simply a collection of tools. It is a single, coherent architecture designed to let teachers use AI safely, efficiently, and without risking significant data breaches. This architecture is what differentiates ChalkboardAI from every existing AI tool marketed to schools.

At its core are three tightly integrated components:

1. The Chalkboard Class Record (local, teacher-owned data layer)
2. The Data Minimisation + Pseudonymisation Layer (privacy and compliance engine)
3. The Task Modules (tool-specific workflows for real classroom jobs)

Together, these form a system that is modular, auditable, and GDPR-compliant by design.

6.1 The Chalkboard Class Record (Local Data Backbone)

The Chalkboard Class Record is the foundation of the Chalkboard ecosystem. It is a single CSV file — a simple spreadsheet format that every program can open — stored on the teacher's device, containing the full class profile across needs, strengths, attainment, and support information. It is intended to become the teacher's digital notebook and class record: one clean, consistent dataset, maintained locally and never uploaded to a server.

Instead of producing separate exports for each tool — a major GDPR risk in current school practice — the teacher loads the Chalkboard Class Record once per session. It enters a temporary, local-only workspace in the browser. It does not persist after the session ends.

Typical fields may include:

- real names (used for local matching only)
- SEND needs and strengths
- support requirements / adult allocation
- safeguarding or pastoral flags
- academic groupings / prior attainment

- seating constraints
- intervention needs and priorities

This full record never leaves the teacher's device. When a tool runs, it does not receive the entire Chalkboard Class Record. Instead, it requests only the fields defined in its Required Data Profile — a narrowly scoped, task-specific subset. Only that subset is ever processed further.

In effect, the Chalkboard Class Record becomes the teacher's 'single source of truth': powering every Chalkboard tool while remaining local, private, and fully under the teacher's control.

6.2 Automatic Pseudonymisation Layer (Privacy Engine)

Built on top of the Chalkboard Class Record is ChalkboardAI's most important innovation: the automatic pseudonymisation layer. This is the mechanism that ensures GDPR compliance is automatic, not something the teacher must remember or manually enforce.

For every use of a ChalkboardAI tool, the same process is followed:

1. Name-detection
All real names in any uploaded file (CSV, timetable, notes, reports draft) are detected using a combination of:

- the Chalkboard Class Record's known pupil list
- a hardcoded name-dictionary
- contextual detection patterns

2. Red-flagging
Any text that may include personal data is flagged immediately. Teachers must actively override the warning or edit the data set before continuing.

3. Pseudonym generation
Each real name is replaced with a stable anonymised label (e.g., Pupil-14).
This mapping is stored only locally, in memory and temporary local storage.

4. Reidentification map

After the model produces its anonymised output, the system converts pseudonyms back to real names locally. The AI never sees the real identities.

5. In-memory handling

All mapping structures — real→pseudo and pseudo→real — are stored temporarily and purged when the session ends.

This layer is what transforms risk into safety:

- Teachers cannot accidentally submit identifiable data.
- Tools remain compliant even under time pressure.
- School leaders gain confidence that all workflows are safe by default.

No current AI tool designed for teachers offers this level of enforced protection.

6.3 Task Modules (Tool Layer)

Every ChalkboardAI tool sits on top of the same data backbone and privacy layer. Tools are modular, independent, and lightweight — but because they all share the Chalkboard Class Record, they remain consistent and do not multiply workload.

Current and proposed modules include:

- Groups — builds intervention or project groups using anonymised needs data.
- Rota — generates support timetables using the school's anonymised timetable and intervention priorities.
- Reports — drafts personalised report sections using anonymised attainment and needs profiles.
- Provision Mapper — maps SEND provision across the term, in line with pupil needs.
- Parents' Evening Notes Generator — produces structured notes for meetings, drawn from the Chalkboard Class Record.

- Chalkboard Coach (future behavioural module) — safe, anonymised AI interaction for pupils, potentially feeding insights back into the Chalkboard Class Record once policies allow.

Because each module plugs into the same system, ChalkboardAI grows without becoming bloated or inconsistent. A teacher can use several tools per session without re-entering data, solving the current problem of disconnected apps and incompatible outputs.

6.4 The Advantage of Unification

Most EdTech tools exist in isolation. They require separate inputs, separate data exports, and separate accounts. This multiplies workload and creates privacy risk.

ChalkboardAI's unified architecture solves these problems at the root.

Because all tools draw from the same anonymised dataset:

- Teachers save time — no repeated data entry, no duplicated exports.
- Contradictions are reduced – when the Chalkboard Class Record is updated (for example, a change in need, attainment, or support), future runs of any tool see that same change.
- Privacy risk is minimised — one local record, one anonymisation pipeline.
- Quality improves over time — as teachers maintain and update the Chalkboard Class Record, the data set that is provided to the AI becomes richer over time, thus allowing more bespoke, more high-quality output.

This is the architectural innovation that other EdTech systems lack.
They build tools; ChalkboardAI builds a system.

7. FAQs

1. Is ChalkboardAI cloud-based or does any pupil data leave the school network?

No. ChalkboardAI is intentionally local-first. All identifiable data stays on the teacher's device. Only anonymised, minimised data is ever sent to the AI model, and only for the duration of that single operation. Nothing is stored or reused.

2. What happens if a teacher stores their Chalkboard Class Record on Teams, OneDrive or a shared drive?

This is permitted within the school's existing cloud provider arrangements. If the school already uses Microsoft 365 or Google Workspace under DfE-recommended contracts, storing a CSV within that environment falls under the school's existing GDPR compliance. ChalkboardAI still anonymises the data before any processing occurs, adding a second protective layer.

3. Can job-share teachers or multiple staff members access the same Chalkboard Class Record?

Yes.
Two (or more) teachers can use the same Class Record by saving it in an agreed shared location. Because pseudonymisation is generated per session, the record remains consistent and safe regardless of who loads it.

4. What if a teacher accidentally uploads a document containing real names?

ChalkboardAI automatically detects real names using only the data the teacher has locally loaded for that session (the Chalkboard Class Record). It also applies simple contextual algorithms to identify name-like patterns in the uploaded file (e.g., capitalised first–last name structures). If any real names are detected, the system triggers an immediate red-flag warning and the teacher must correct or confirm the data before continuing. This prevents accidental data breaches without ChalkboardAI storing or accessing any school data itself.

5. Does the AI ever see real pupil names?

No. Names are replaced with pseudonyms on the teacher's device *before* anything is sent to the model.
Reidentification happens locally after the anonymised output is returned.

8. Towards Safe AI in Schools

AI will shape the future of education, but how it is introduced matters. ChalkboardAI demonstrates that it is possible to combine innovation with responsibility: AI that protects identity, reduces workload, and enhances teaching without adding risk.

The approach outlined in this paper is deliberately practical and deliberately cautious. It offers schools a way to explore the benefits of AI while maintaining the highest standards of data protection and professional oversight.

The next phase is implementation and collaboration. With input from teachers, school leaders, and safeguarding professionals, ChalkboardAI can become a model for safe, meaningful AI use across the sector.

This paper is being shared to invite feedback, scrutiny, and collaboration. The next stage is a structured pilot with a small number of primary schools. We welcome input from school leaders, SENCOs, DSLs, data protection officers, and edtech technical teams.