ChalkboardAI

The secure data layer for AI in schools.

Safe. Local. Powerful.

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A Privacy-First Approach for AI-Augmented Classroom Practice

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Document History

Version	Date	Author	Summary of Changes
1.0	23 Nov 2025	T. Barton-Wilkes	Initial methodology draft.
2.0	03 Dec 2025	T. Barton-Wilkes	Major rewrite; reframed ChalkboardAI as privacy-first infrastructure; added system architecture.
2.1	TBC	T. Barton-Wilkes	Planned: future capability section on retrieval and verification.

1. Executive Summary

Schools in the UK are being hit by two crises at the same time.

The workload crisis: invisible work is breaking the profession.

Teachers are overwhelmed. Alongside the responsibilities of running a class, they carry a huge administrative load: SEND paperwork, intervention planning, notes, provision mapping, parent-evening prep, grouping, report writing, and constant data updates.

This 'invisible' labour — the repetitive, paperwork-heavy tasks — is a major driver of the recruitment and retention crisis.

AI could ease this pressure, but at the moment this is not possible because of the second crisis facing schools:

The 'AI Wild West' – teachers are already using AI, but without guardrails.

Teachers are currently free to use AI tools however they choose. Nothing technically prevents a teacher from pasting names, SEND details, behaviour notes, or other sensitive information into an LLM (Large Language Model), beyond the existing GDPR rules — and in practice, if a teacher breaches them in this way, it is almost impossible to detect. This situation is unsafe and unsustainable. The DfE and ICO have already signalled that clearer rules for AI use in schools are forthcoming, and schools are preparing for stricter compliance expectations.

The DfE is already consulting on AI in schools and, alongside the ICO, is expected to impose strict, non-negotiable rules on how pupil information can interact with AI.

Most of the AI tools currently used in schools are unlikely to meet the forthcoming requirements.

This document introduces the ChalkboardAI Approach — a privacy-first system architecture built to meet that regulatory moment while meaningfully reducing workload.

2. What is ChalkboardAI?

ChalkboardAI exists at the intersection of the two problems outlined above.

It is not a collection of tools.

It *is* a compliance-ready AI infrastructure, built on principles that meet both the workload crisis and the regulatory reality.

- A local, teacher-controlled Central Record holds pupil data securely.

- A built-in automatic anonymisation engine prevents identifiable data from ever reaching the AI.

- Modular tools (groups, rota, reports, provision mapper) plug into this secure foundation, pulling only the minimum data needed.

- Re-identification happens solely on the teacher's device.

- Everything is transparent, auditable, and minimal — built to meet both current GDPR requirements and the likely direction of future guidance.

There is a clear gap in existing solutions: none currently provide a local-first, teacher-controlled, pseudonymisation-by-default architecture. ChalkboardAI is proposed as one model for filling that gap.

ChalkboardAI is therefore not just helpful.

If AI becomes normalised in schools, a privacy-first infrastructure layer will almost certainly be required to manage risk at scale.

ChalkboardAI offers one viable approach for this emerging need.

It is proposed as the foundation for a new, compliant, workload-reducing AI standard for schools.

3. Why ChalkboardAI is Needed

3.1 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. The tasks that consume teachers' time are overwhelmingly structured, data-rich processes — but the tools currently available are unstructured, generic, and disconnected from the information required to automate them safely. This is the problem the ChalkboardAI Approach is designed to address.

3.2 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. By design, these tools cannot prevent accidental data leakage, because they rely entirely on user behaviour rather than technical enforcement. This is not compliant with UK GDPR's requirement for data-protection-by-design.[9]

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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] Data protection by design and default | ICO

A second concern is the problem of AI hallucinations. While modern LLMs can verify facts when explicitly instructed to do so — or when integrated into retrieval-augmented or agent-based systems — they do not routinely perform factual verification by default. Their core behaviour remains generative, not evidential, meaning that inaccurate or misleading output is still a common failure mode.[10] In education, where schools handle sensitive data and real pupils, this is not a minor inconvenience. It can undermine trust, introduce errors into planning and assessment, and create potential safeguarding risks. Crucially, the current market offers no widely adopted AI tool designed for schools that meaningfully mitigates or flags hallucinations through enforced verification or domain-specific safeguards.

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.

3.3 The gap

The gap between what is currently available and what teachers need is clear and easily stated.
The gap is not in the absence of effective tools.

The gap is not in the current and future regulations.

The gap lies in a missing layer of data-secure AI infrastructure — a foundation that allows schools to use teacher-facing tools with confidence rather than caution.

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[10] [A Survey on Hallucination in Large Language Models: Principles, Taxonomy, Challenges, and Open Questions](#)

Without this layer, tools cannot work with real pupil information safely; teachers must rely on prompts instead of structured workflows; and schools are left responsible for compliance decisions that should be handled by design, not by individual judgement. This missing infrastructure explains why existing tools remain generic, inconsistent, or high-risk, no matter how well intentioned they are.

What teachers need, above all else, is trust. Trust that their data is protected automatically; trust that tools will work every time; and trust that AI will reduce workload without introducing new risks. Only a privacy-first, school-centred infrastructure can provide that.

4. 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.

4.1 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.

4.2 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.

4.3 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.

4.4 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.

4.5 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.

4.6 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.

5. 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.

5.1 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.

5.2 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.

5.3 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.

5.4 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.

6. 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.

7. Towards an AI Safety Standard for 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.