A new Level 3 qualification in ‘Data Science & AI’

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Version 17, 15 Nov 2025

The UK government accepted all the recommendations of the AI Opportunities Action Plan, launched in January 2025. A strong emphasis in the plan is the development of human capital, to maintain the UK as one of the leading countries in the world in Artificial Intelligence (AI), but at risk of falling further behind the USA and China. The plan was clear that the government needs to create a deeper pool of AI skills and talent who will build, diffuse and use AI products across the economy.

This paper is a proposal for how we might use a new Level-3 qualification in 'Data Science & AI’ to excite post-16 students about AI and develop their machine learning (ML) skills in a stimulating programme of study.

It has been extensively refined in the light of multiple interactions with stakeholders, but it is not a finished design. We hope that it may provoke further debate, leading to more refinement. Please write to us: simon.peytonjones@gmail.com, lionel.tarassenko@eng.ox.ac.uk, philip@raspberrypi.org.

1. Purpose

In what ways should our school curriculum adapt to the Age of AI? We propose one specific possibility: a new Level 3 qualification[1] in Data Science and AI. This is but one response to the challenge. Others are also necessary, for example to ensure that every student leaves schools AI-literate.

2. AI skills for the workforce of the future

Our intention is that a new Level 3 qualification in Data Science and AI will attract a much wider constituency than currently take the A-level in Computer Science. It is helpful to distinguish three groups of students within any given year’s sixth-form. (In any year just under 600,000 students are studying for A-levels, 300,000 in each of Years 12 and 13.)

A. The software developers and AI innovators of the future. These students enjoy creating new software by programming and love the intellectual richness of computing, including programming. They make up approximately 7% (20,000) of the overall A level cohort, with girls very much under-represented.

However, in 2023 (latest available data), there were nearly 95,000 university applications from UK 18-year-olds for ‘Computing’ courses. This suggests significantly greater enthusiasm for study at undergraduate level, possibly driven by career aspirations and salary potential.

B. The professionals of the future. AI, principally ML, is beginning to have an impact on a broad range of professions, affecting not only doctors, biologists, and physicists, but also those in less STEM-centric professions such as lawyers, economists, and psychologists.

[1] Quick reminder: **Level 2 qualifications** are typically taken by 16-yr-olds. GCSEs are Level 2 quals, but there are many others. **Level 3 qualifications** are typically taken by 18-yr-olds, and are often called “post-16” quals. A-levels are Level 3 quals, but there are many others.

To maintain the UK's position as a leading country in AI, we believe that the professionals of the future should have the opportunity to acquire, during their last two years at school, a foundational understanding of how data analysis and ML algorithms work; for these students, *their motivations will be driven by applications* rather than by excitement about computing itself. Our guess is that this cohort represents 35-40% of the overall group.

C. **The citizens of the future**. Every single person must be digitally literate, to survive and thrive in a world pervaded by digital technology. That includes students whose A-level choices are mostly English, languages, Latin, PE, social science, education, art and religious studies, representing 50-55% of the cohort, and going on to study the arts and humanities at University.

A well-designed, modern digital literacy qualification should be available to *all* students, including those in Cohort C, but we are initially focusing on a Level 3 qualification aimed at Cohort B.

The aim of this proposal is to provide Cohort B, the future professionals, from doctors to economists, with suitable AI skills prior to their University studies, as part of creating that deeper pool of AI-savvy talent within the UK. Their interest in AI is primarily an applied one (*how can I use it?*); the goal of the new qualification is to give them the underpinning knowledge and understanding (*how does it work?*) that will equip them to make best use of ML.

3. Level 3 qualification in Data Science & AI

3.1. Title

'Data Science & AI' is the working title for this new qualification. We are not wedded to it.

3.2. Rationale for a new qualification

We propose to design a new free-standing qualification in Data Science & AI for Cohort B. This new qualification would sit alongside and complement the existing A-levels in Maths, Statistics, and Computer Science.

Why do we need a new qualification? Would it not be possible to broaden the existing A-level in Computer Science to include significant ML content, avoiding the need to establish a new Level 3 qualification? We considered this possibility carefully[2], but have concluded that it would be the worst of all worlds, for the following reasons:

- **The content is distinct**. As mentioned above, the overlap between computing and data science & AI is minimal, so squeezing both into a single A-level would not be feasible. To put it another way, a qualification in Data Science and AI could not be an incremental change to the existing A-level in Computer Science: it would require a complete rewrite, discarding much of the existing content. That would disrupt and dilute the established, and quite successful, A-level with its experienced teachers, and the experience of the awarding organisations in offering it. "If it ain't broke, don't fix it". The last thing we want to do is to replace a successful model with one that does not satisfy anyone.
- **The target audience differs.** The danger is that Cohort B students will be put off by any Level 3 qualification that looks like "Computer Science".
- **The prerequisites differ.** While GCSE Computer Science is not a formal pre-requisite for A-level Computer Science, evidence from AQA suggests that it is *highly* desirable. But we specifically do not want GCSE Computer Science to be a pre-requisite for the new Level 3

[2] There is some precedent for a broad structure, with options, in the form of AQA's A-level Physics exam. In practice, the school/teachers may choose which options (pathways) are available, limiting students' choice.

qualification in Data Science & AI, because that would exclude a large fraction of our hoped-for Cohort B students.

- **Scope for innovation**. There are several ways in which the new qualification will be, by design, innovative and therefore experimental, notably in its use of distance learning and its tighter review cycle. It would be much easier and lower risk to test and refine these innovations in the context of an entirely new Level 3 qualification.

After extensive debate, we have therefore concluded that the only viable option to achieve the goal of teaching relevant AI skills to the professionals of the future (Cohort B) is to have a new, separate qualification in 'Data Science & AI'.

3.3. What sort of Level-3 qualification?

Emerging from our consultations with stakeholders, two main possibilities have been suggested for the new qualification:

- Create a new A-level in Data Science and AI
- Create a specialised form of Extended Project Qualification (EPQ)

In this section we contrast these alternatives.

3.3.1. A new A-level

A new A-level offers a simple, clear, well-understood, high-status option that needs no explanation. That is a big advantage.

But it is also a heavyweight option, that carries real costs:

- A-levels are ponderous: they are hard to get approved, and it is hard to change their content. For example, the curriculum of the Computer Science A-level was last revised in September 2015, ten years ago. This is a problem for a very new and rapidly-evolving topic such as AI.
- A-levels are mainly assessed through final exams. Coursework (non-examined assessment, NEA) is only available in some subjects.
- Offering a new A-level would represent a risk for schools: they know what grades their students will get in (say) maths, but in a new A-level they will be more uncertain.
- Students typically do three A-levels, so a new A-level would displace some other A-level in the student's programme; there is an opportunity cost.
- Awarding organisations would need to design and implement the new A-level, with all the requirements for validity and reliability that surround a high-stakes A-level.

3.3.2. An Extended Project Qualification (EPQ)

The Extended Project Qualification is an independent research project leading to an extended report or artefact.

- It is typically undertaken alongside a programme of 3 A-levels, and attracts up to 28 UCAS points, equivalent to half an A-level.
- The student, with guidance from a supervisor, selects their own topic for the project.
- The project is supervised by a teacher who can be, and usually is, a non-specialist in the project domain. The role of the supervisor is to guide the student and to assess the final project.
- Assessment focuses on how well they meet the qualification objectives - such as demonstrating independent research, critical analysis, and project management skills - rather than on specific subject content.

Framing the new Data Science and AI qualification as an EPQ would stretch the boundaries of what an EPQ is. But there is precedent: the existing CyberEPQ also stretches the boundaries: it has a

substantial 9-module taught component, delivered online. A 'Data Science & AI' EPQ could be modelled on this exemplar, with project work based on nationally-available datasets (for example, satellite data for climate change monitoring).

Taking an EPQ is low-risk for the school and the student, because it is taken alongside an existing programme of A-levels. It would make A-level Computer Science teachers less anxious about the new 'Data Science & AI' Level 3 qualification, because an EPQ would be less likely to displace that A-level.

1.1.3. A-level or EPQ?

We are attracted by the clarity of a new A-level, but the feedback we have received strongly suggests that it might be better to launch the qualification as a lower-stakes EPQ. That would allow nimbleness and flexibility as we learn from experience, especially that of on-line teaching, and would offer students and schools a low-risk "way in".

An EPQ would also be far more agile. It is hard to imagine a new A-level being available for first teaching before Sept 2027, and it could quite possibly end up being Sept 2029. In contrast we could pilot a small-scale EPQ in Sept 2026, and subsequently launch it on a larger scale in Sept 2027.

If successful, and there was evidence of demand, it could subsequently morph into an A-level with the higher costs that would entail.

1.2. Funding

We believe that it is essential that the government emits a positive signal to schools that it wants them to engage with this new qualification. The most credible way to do so is to include the qualification in the funding streams that support highly-valued subjects, especially:

- Advanced Maths Premium
- Core Maths Premium
- Large Programme Uplift
- High Value Courses Premium

We do not have a well-informed opinion about which of these funding streams (or some other stream) is most appropriate, but we are convinced that the new qualification would be *much* more likely to succeed if supported by a strong "premium course" signal from the government.

1.3. Other prior art at Level 3

There are other qualifications in Level 3 space from which we could perhaps learn. For example:

- Core Maths qualifications
- The MEI Maths into Data Science and AI course. Taught online across a term, assessed by submission of a practical task and a 60-minute exam.

1.4. Equity and access: T-levels and V-levels

In line with the 2025 White Paper on post-16 education and skills, we are keen that, in the end, the new qualification should be available in some form to *all* students, including those taking more vocational pathways.

One practical route to achieving this would be also to make the qualification available as an optional component within relevant T-Level programmes, for example those in the Digital, Science, or Engineering and Manufacturing routes. T-Levels are built around three main elements: a core component covering broad underpinning knowledge and skills, one or more occupational specialisms, and an industry placement, so there are clear opportunities to align a Data Science & AI element with this structure. The foundational knowledge of AI and data analysis could be embedded

within the core component of an appropriate T-Level, ensuring that all learners gain exposure to essential digital and data literacy. Alternatively, the qualification could be developed as an occupational specialism in its own right, or as an employer-set project within the technical qualification, enabling students to apply AI and machine learning techniques to real-world datasets.

Framing the qualification in this way would promote parity of esteem between A-level/EPQ and T-level pathways, allowing every learner, academic or vocational, to access the same high-quality national resources, datasets, and project frameworks. This approach would also support the government's ambition to build an inclusive, AI-ready workforce by unifying academic and technical education around shared Data Science & AI foundations.

Another pathway could be to launch a V-level in Data Science and AI. We will study that option when the V-level landscape becomes clearer.

2. Delivery and assessment

In this section we will look specifically at how a specialist EPQ would be delivered and assessed. Here we envisage an EPQ framed in the same manner as the Cyber EPQ with a programme of taught content leading to an independent piece of project work.

2.1. Teaching

Given the rapid pace of ML development, many teachers will lack the necessary knowledge, skills, or confidence to deliver a specialist Data Science and AI curriculum. Nor do we believe that this gap can be filled by a few short up-skilling courses for teachers.

We propose that the taught content would be delivered online in the form of a centrally-managed collection of resources, and supported remotely by subject experts. We envisage

- Primarily asynchronous delivery: the online platform would have learning materials, including videos and lab projects, that the students could access independently. However, schools could choose to timetable students to engage with the content if this suited their local EPQ delivery model.
- The course would be supported by subject matter experts who would be available to the students and their teachers where specialist advice was needed.
- AI tools could be used to support personalisation, diagnostics, and progress tracking.
- Teachers would assess the project (as in current NEA models), with guidance from experts to help build teacher capacity.

No other Level 3 qualification, apart from the Cyber EPQ, is taught in this way; we recognise that this is a major innovation of this proposal. It would be sensible to pilot the new Level 3 qualification first, with a relatively small number of schools, gain experience, and refine the model, before scaling up nationally.

We give some more details about how the distance learning might work in Appendix A.

2.1.3. Raspberry Pi Foundation

An online delivery plan will only work if there is an organisation willing to do it. The Raspberry Pi Foundation (RPF), with its extensive experience in developing online learning materials, is keen to support this initiative. The Foundation has built considerable expertise in the area of AI and has developed a global programme, Experience AI, in collaboration with Google, targeting students aged 11-14. This programme has been deployed in 23 countries, reaching 1.8 million students. Teachers are trained and supported to deliver the programme, including access to an online course catalogue that includes an Introduction to Machine Learning and AI.

RPF also partners with the University of Cambridge on Ada Computer Science, a free online learning platform that covers existing A-level and GCSE content in depth and includes formative assessment with feedback on incorrect answers. The platform features content on AI and machine learning and uses AI to provide some feedback to learners. The Foundation's new Applied Certificate, developed with Greater Manchester Combined Authority, is another example of a digital delivery model.

2.1.4. Awarding body

The EPQ is offered in England by the three main exam boards: AQA, OCR and Edexcel(Pearson). The Cyber EPQ is awarded by City & Guilds in partnership with CIISC. We would have to engage with an awarding body at the early stages of course design and development.

2.1.5. Valuing the classroom teachers

With a specialist EPQ, the taught component should be supported by a teacher. The local, in-person teacher (perhaps from maths, computer science or another STEM subject) remains central to the proposition.

Indeed, a key goal is to build the capacity and confidence of teachers, alongside supporting students. We expect that teachers will themselves learn from the course, and will, over time, become increasingly able to support the new Level 3 qualification themselves. Far from side-lining teachers, the goal is to empower them to become confident in a fast-moving area that might otherwise seem dauntingly out of reach.

2.1.6. Prior art

There is some prior art for distance learning at school level, from which we should learn. Here are examples we know of; we would be happy to learn about others:

- The Girls Day School Trust runs a Space Technology Diploma for Year 12 students, that is largely taught by distance learning.
- The University of Cambridge's STEM smart programme gives distance support to high-potential A-level students from disadvantaged backgrounds. The Raspberry Pi Foundation is involved in this.
- Some schools such as Woolsey Hall specialise in online support for home-schooled children.

The Open University may also be a source of expertise, with decades of experience in distance learning, although primarily at tertiary stage.

2.2. Pre-requisites

There are no pre-requisites for taking an EPQ. For this specialist EPQ we would propose that a GCSE in Maths at grade 4 or above is a pre-requisite. However, since all students take GCSE Maths, this does not seem an onerous requirement.

3. Progression to university

The university system is slow to adapt to new subject knowledge in their entrants. For example, despite the existence of the A-level in Computer Science, few university Computer Science courses treat students with the A-level differently from those without.

The new Level 3 EPQ in Data Science & AI would be more attractive, both for students and for universities, because it would give school leavers a background in machine learning that would enable them to understand and use ML algorithms throughout their degree course. This would be most useful for students in a huge variety of degrees other than Computer Science: STEM subjects such as physics and biology certainly, but also law, economics, linguistics, psychology, and the like.

4. Frequently asked questions

4.1 Doesn't AI itself make a new Level 3 qualification unnecessary?

Some people believe that, because AI-powered large language models can apparently write code, the market for software developers (Cohort A) will disappear; and even Cohort B students won't need to know much to make effective use of AI.

We think precisely the opposite. AI is not like a car, with a single purpose, and a simple universally accepted user interface. Rather, ML is set of data-driven algorithms implemented as software tools, using which skilled users can develop remarkably effective applications. Our young people need more, not less, understanding of ML and its applications, to have a chance to be active adults in their chosen profession, driving change. A Level 3 qualification in Data Science and AI will provide some of the intellectual scaffolding, and practical skills, that they need to thrive in a rapidly changing landscape.

Readers may be interested in Why we should (still) teach our children to code, and Why our kids still learn to code in the age of AI.

4.2 Can't we just teach AI in other A-levels?

One might wonder whether it would not be better for A-level students to learn the proposed AI content directly in-context, as part of their A-levels in Physics, Chemistry, Biology, Maths, Economics, rather than as a separate A-level. Neat as such an idea sounds, we are confident that it would fail:

- The whole point about a Data Science & AI Level 3 qualification is that foundational knowledge about *how AI actually works* is necessary to apply ML in a fluent and sophisticated way to problem domains.
- Students equipped with the new Level 3 qualification will then be able to go on to specialist university degrees in medicine, biology, physics, law, etc, equipped with the foundational knowledge that will let them use ML well in those domains. Specialist knowledge at degree level will enable students to realise how transformational ML can be for that subject (for example, the use of AlphaFold in Biology or Biochemistry to predict the 3-D structure of proteins).
- Teachers of A-level Physics, for example, are interested in physics; for them AI is very much a means to an end.
- If we seriously intended to teach AI as part of other A-levels, we would have to remove substantial amounts of material from the curriculum in maths, physics, chemistry, biology, economics, law, etc. This is not a proposition that we can realistically contemplate; we would manage to unite the whole of the teaching profession against AI.

Back in the late 90's there was an attempt to teach "ICT across the curriculum" with a similar flavour to the above. It was an utter failure.

5. Timescale and next steps

Should this proposal continue to receive positive feedback from the community and the Department for Education (DfE), a syllabus will need to be developed. It is envisaged that this work would be led by the Raspberry Pi Foundation, in consultation with an awarding body and professional bodies such as BCS and the Royal Society, alongside representatives from industry and higher education institutions (HEIs).

In parallel, we should also begin considering how a pilot project could be implemented - perhaps by working with a small number of engaged schools in the first year, before expanding to additional schools as we refine the content in response to testing and feedback.

Appendix A: Distance learning

Important information! This is a first draft and is not a fully-fledged proposal for course delivery.

5.1. Core Principles

Since most students will have a non-expert teacher and will rely heavily on online materials, our approach should ensure:

- **High-quality online resources** accessible to all students.
- **Built-in scaffolding** to support weaker students with challenging concepts.
- **Accessible support channels** for both teachers and students.

5.2. Structure

- Provide a clear, week-by-week roadmap aligned with the course specification.
- Build in flexibility for different school holiday dates, INSET days, and other timetable variations.
- Design content in short, self-contained modules (20–30 minutes each) that can be combined for longer lessons.
- Include a recommended weekly time split for in-class and independent study activities.

Each week's pack could include:

For teachers:

- Short explainer video (10–15 min) aimed at non-expert teachers.
- Guidance notes, concept maps, learning objectives, key vocabulary, and common misconceptions.
- Weekly checklist to ensure all key activities have been covered.

For students:

- Online learning materials.
- Recorded mini-lectures or narrated presentations.
- Step-by-step worked examples for problem-solving.
- Interactive animations or simulations for abstract concepts.
- Formative assessment questions - auto-marked quizzes with immediate feedback explaining why an answer is wrong and what to review.
- Independent study guide: recommended independent study activities matching the taught content; Stretch and challenge tasks for stronger students; Model templates (Cornell notes, mind-maps, flashcards) to build retrieval practice into weekly routines.

5.3. Support from Expert Teachers

- **Online support sessions**: Weekly session(s) with a subject specialist to go over that week's set questions, recorded for asynchronous viewing.
- **Online Q&A forums**:
    - Student discussion board for questions and peer support.
    - Teacher discussion board for guidance and collaboration.

5.4. Progress Tracking & Motivation

- Dashboards showing student progress and performance trends.
- Prompts for self-reflection: *“What have I mastered? What do I still find hard?”*

5.5. Assessment & Feedback

- Mini-assessments every 2–3 weeks.
- Set and marked by the teacher, using provided mark schemes and model answers.

Build in **revision weeks** every 6–8 weeks to revisit past content and practise exam-style questions

Appendix B: Content

What knowledge and skills would form part of the new qualification? This sketch of content is very much a strawman. A good deal of detailed work would need to be done to flesh it out, including the addition of substantial data science material. Moreover, it was written with an A level in mind, and would need revision for the EPQ format.

Nevertheless, we present it here just to give the general idea.

- The history of AI since Alan Turing's 1950 paper
- Data collection and preparation (including data standardisation)
- Foundational understanding of how AI and ML algorithms work
- Modern architectures (graphics and tensor processing units; data centres and their power requirements)
- Social, legal and ethical issues (including AI-related issues like algorithmic and data bias)
- Module 1 (Core ML models)
    - nearest-neighbour algorithms, logistic regression, single-layer perceptrons, decision trees
    - From single-layer to multi-layer perceptrons; hidden layers, error back-propagation as a concept (credit assignment)
- Module 2 (Deep learning and reinforcement learning)
    - Deep learning: large-scale datasets; convolutional neural networks; image analysis
    - Reinforcement learning: intelligent agents; rewards and penalties; learning strategies; examples of reinforcement learning: AlphaGo and AlphaFold
- Module 3 (Modern AI – frontier models)
    - Recurrent neural networks; LLMs: tokenisation, embeddings and attention mechanism; next-token prediction; hallucinations
    - Applications of LLMs; prompt engineering, use of multi-modal data
- Major NEA (possible exemplars: climate change monitoring and analysis of wearable data)

The initial detailed syllabus would be designed with input from the BCS and the Royal Society, as well as industry.

Agility of content would be an important consideration. Our current processes provide no revision cycle at all for the DfE-mandated Subject Specification for an A-level. In practice it takes a decade to modify these specifications..

We propose the setting-up of a standing Ofqual-approved Accreditation Committee, with a BCS Chair, which would oversee regular syllabus updates (annually or bi-annually) to keep pace with the latest ML developments. This is not unknown; for example T-levels have a regular review. We do not anticipate rapid disruptive churn; rather, regular tweaks.

Assessment of an A-level qualification

If the new qualification was an A level we would need to pay careful attention to assessment. (For an EPQ the assessment regime is less onerous.) We propose an assessment model which would have a mixture of written exams and Non-Examined Assessment (NEA) tasks, set by the exam board.

By a "written exam" we mean that the exam takes place at one place and time, under controlled conditions. *But it could be on-screen* (as AQA do in A-level Computer Science, and Pearson do in GCSE in Computer Science), which provides opportunity for more flexible tasks than just "write down an answer"; for example, the ability to modify and run a program.

The question of non-examined assessment (NEA) is particularly tricky, and would need careful design. AI is a practical subject, and experience of using ML in practice is fundamental to learning

about it. And yet NEA is rife with unintended consequences: assessment load for teachers; students over-investing in NEA; poor discriminating power; onerous moderation to ensure reliability, etc.

A possible alternative approach is used in Chemistry:

- The awarding organisation provides a series of set tasks, which students must carry out.
- A written exam includes questions that are specifically linked to those set tasks.
- The tasks themselves do not contribute to the grade, only the exam does.

Using a set NEA task (as opposed to a student-chosen project) would ensure all students are assessed on the same core skills and would make expectations clear from the outset. This approach helps overcome one of the main challenges for inexperienced teachers when setting coursework: guiding students in choosing or scoping their projects, as teachers are often uncertain whether a proposed task meets A-level standards. When students select their own tasks, there is a risk that projects become either too ambitious or too trivial, which can significantly impact final marks.

While set tasks provide consistency and simplify moderation and standardisation, they also risk disengaging students who may find the prescribed topic irrelevant or uninspiring. This would be a challenge for the board, but the answer will surely be to provide tasks which will excite and motivate students; for example, assessing the impact of climate change on the planet using images from Earth Observation satellites using deep learning, or fine-tuning a Large Language Model to analyse sleep patterns from data recorded with wearable technology.

We would hope to partner with an awarding organisation to manage the assessment.