

Learning to Learn: Rebuilding Actuarial Training for an AI-Augmented Profession

ASSA Research Committee First Essay Competition: A Student Member's Perspective

Most mornings, before I open Python or Excel, I open an AI chat window. I usually already have several AI tabs grouped together under a folder named "AI" for quick access.

Over the past seven months, as a Graduate-in-Training at Eskom working toward my actuarial qualification, I have taught myself Python basics, pdf scraping, data cleaning and modelling, built my first Power BI dashboards, and improved my Excel proficiency. Whenever I get stuck on code, AI is there to assist me, functioning almost like a patient, always-available tutor.

None of this was part of my formal curriculum. I have been building it alongside my studies, in the gaps between preparing for A214 and managing the demands of my graduate role, because I sensed that the skills I will need in ten years are not the same skills I am currently examined on.

That gap between how the profession trains us and how the profession is starting to work is, I believe, one of the most important challenges facing South African actuaries over the next decade. AI will not make actuaries obsolete. But it will quietly redraw the boundary between those who lead the profession's next chapter and those who struggle to keep up with it.

A widening gap between the exam room and the workplace

Actuarial education in South Africa, like most systems globally, was built for an era when data was scarce, computation was expensive, and manual calculation demonstrated professional competence. Our examinations, including subjects like A214, still largely reward closed-book calculation and formula recall. Meanwhile, the daily reality for trainees increasingly involves AI tools that write code, summarise regulations, draft reports, and explain statistical methods in plain language.

This is not an argument for replacing mathematical knowledge with AI. A solid understanding of mathematics remains essential because an actuary who cannot verify AI-generated output is not being supported by AI. Instead, they are simply trusting it without question. The concern is narrower: the skills tested in the syllabus and the skills required in practice are drifting apart, and that drift is accelerating faster than ASSA, universities, and many employers have fully acknowledged. A 2025 survey by the Institute and Faculty

of Actuaries, IFoA, GenAI Working Party found that the majority of actuaries rated their AI knowledge as basic or intermediate, suggesting that uptake is outpacing structured preparation across the profession.

In my own cohort, AI fluency is almost entirely self-taught, dependent on individual curiosity, access to tools, and time outside formal study. That is a fragile and unequal foundation for the profession's future capability.

What AI changes, and what it does not

It is important to be clear about what is actually changing. Tasks such as data cleaning, routine reporting, automating valuation processes, and writing first versions of code are already well within the capabilities of generative AI. These were never the main source of actuarial value. They were the supporting tasks that helped us get to the real work.

What remains uniquely human, and will become even more valuable, is professional judgement. This includes deciding whether assumptions are reasonable when data is incomplete, interpreting complex regulations, understanding the wider business context, and taking responsibility for advice given to boards, pension funds, insurers, or the public.

AI can draft a report. It cannot take responsibility for the advice in that report. That responsibility, and the trust that comes with it, is at the heart of the actuarial profession. Yet our training still places greater emphasis on computational techniques than on developing the judgement needed to work effectively alongside AI.

The actuary of the future will be defined less by the ability to perform calculations by hand and more by the ability to use AI wisely, question its outputs, recognise when it is wrong, and make informed professional decisions. Those are different skills, and they should be taught and assessed as part of actuarial training.

This shift is especially important in South Africa, where data is often incomplete and public trust in major financial and social systems is critical. In healthcare, AI may help actuaries analyse large volumes of data and model different scenarios for initiatives such as National Health Insurance, but human judgement will still be needed where data is limited, uncertain, or inconsistent. In pensions, recent policy changes such as the Two-Pot retirement system have shown how quickly legislation and economic conditions can influence member behaviour. AI can help forecast these changes, but actuaries must still interpret the broader social and economic factors behind them and decide how they should be reflected in their advice.

The risk of leaving this to chance

If actuarial training does not adapt deliberately, two key risks emerge. The first is over-reliance without validation: a generation of actuaries fluent in using AI tools but under-practised in verifying their outputs. In a profession built on trust under uncertainty, this is a serious concern. A single high-profile failure involving unchecked AI-assisted advice could damage confidence in the profession far beyond the individual case.

The second is the emergence of a two-tier profession. Those with access, exposure, or initiative will develop AI fluency informally, while others will lag behind due to differences in resources, mentorship, or workplace culture. Given South Africa's legacy of unequal access to education and resources, leaving this to chance risks widening professional inequality. This concern is not hypothetical. The same IFoA survey found that 44% of actuaries anticipate significant role changes from AI within a decade, yet exposure to AI tools remains heavily dependent on employer size and organisational policy rather than any structured professional standard.

What should change

ASSA, universities, and employers should treat AI fluency as a structured part of actuarial training, not an optional extra. To do this effectively, we must move beyond general recommendations toward specific, actionable reforms.

First, **curriculum reform**: AI literacy should be formally integrated into the syllabus and Continuing Professional Development (CPD). This is not merely about teaching coding; it includes modules on validating AI outputs, recognising algorithmic bias, documenting AI usage for audit purposes, and navigating the ethical grey areas of automated decision-making. A dedicated "Data, Technology, and Judgement" paper at the professional level could ensure every actuary understands the machinery behind the models they oversee. This does not need to replace existing technical subjects. Instead, it could be introduced at the professional practice level, where the syllabus already focuses more on judgement and communication than on memorised calculation.

The IFoA survey found that coding assistance was one of the most in-demand GenAI learning areas for actuaries, suggesting that technical fluency is quickly becoming a baseline professional requirement rather than a specialised skill.

Second, **examination evolution**: ASSA should pilot open-tool case studies at professional levels, where candidates are given an AI-generated risk report or model output and asked to critique it, identify flaws, and defend their amendments. This would test judgement, not memory, under simulated workplace pressure. Some may argue that examinations are already rigorous, but rigour in manual calculation does not necessarily translate to rigour in AI oversight. We need assessments that explicitly test the latter.

Third, **employer partnerships**: ASSA could collaborate with employers to establish a standardised approach for tracking trainees' AI skills across modules, ensuring consistent development, portability of skills, and greater transparency in training and assessment.

Fourth, **governance standards**: The profession should develop a clear ethical and technical framework for actuarial use of AI, similar to ASSA Code of Professional Conduct and standards. This would guide members on what constitutes "reasonable" reliance on AI and mandate human override provisions for high-stakes decisions.

The actuary of the future

Energy, Climate, and South Africa's New Electricity Market

The transformation of South Africa's energy sector presents one of the greatest opportunities for the actuarial profession to expand its role. The recent ASSA Public Interest paper on South Africa's electricity system showed how actuarial skills can be applied to long-term energy planning, infrastructure investment, and decision-making under uncertainty. However, the profession's contribution to the sector is likely to grow even further.

The introduction of the South African Wholesale Electricity Market (SAWEM) will fundamentally change how electricity is bought and sold, shifting from a regulated single-buyer model to a competitive market. This transition will introduce new sources of financial risk, including price volatility, counterparty credit risk, and the need to value increasingly complex financial contracts. These are precisely the types of problems actuaries are trained to solve.

AI will play an important role in this environment by forecasting electricity prices, optimising trading strategies, and simulating thousands of possible market and climate scenarios. However, AI models remain dependent on the assumptions and data used to build them. In a new market such as SAWEM, where liquidity may initially be limited and policy uncertainty remains high, an AI model may recommend strategies that appear optimal mathematically but prove unrealistic or financially unsound in practice.

This is where the future actuary adds value. Rather than accepting AI-generated recommendations at face value, actuaries will be responsible for challenging assumptions, interpreting results within their broader economic and regulatory context, and exercising professional judgement before decisions are made. That could include assessing whether the electricity grid can support higher levels of renewable energy while also evaluating the financial resilience of market participants under severe stress scenarios.

My experience at Eskom has reinforced my belief that the next decade will not belong to those who build the most sophisticated AI models, but to those who know when to trust them, when to question them, and how to apply their outputs responsibly. In this way, the actuary becomes the bridge between advanced technology and sound decision-making, ensuring that the transition to a cleaner and more competitive electricity market is supported by robust risk management rather than blind confidence in algorithms. Yet none of this judgement can be taken for granted. It must be developed deliberately, which is exactly why the curriculum reforms proposed above matter beyond the classroom.

AI governance and oversight

Over the coming decade, the actuarial profession is likely to evolve in response to the growing use of AI in decision-making systems. Actuaries are likely to take on expanded responsibilities in the governance, validation, and oversight of AI-driven models.

Rather than focusing exclusively on building models for insurers and pension funds, actuaries may increasingly be involved in evaluating algorithms used across financial services, including banking, insurance, credit scoring, and even public sector decision systems. As AI becomes more embedded in these areas, the profession's strengths in modelling, risk management, and ethical judgement will be critical in ensuring that such systems remain transparent, robust, and appropriate for use in high-impact societal and financial decisions.

Conclusion

The actuarial profession in South Africa will not be displaced by AI over the next ten years. But it will be reshaped by how well actuaries combine professional judgement with AI-enabled tools.

My own experience learning Python, Power BI, and advanced Excel with AI as a daily learning partner has convinced me that this shift is already happening at the individual level, largely in an unstructured way.

The challenge for ASSA, universities, and employers is to make this transition deliberate rather than accidental. If done well, the next generation of South African actuaries will not be defined by what they memorise for examinations, but by what they have learned to learn.

References

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Disclosures

Use of AI: AI tools were used to assist with editing, structuring, and refining language. The arguments, opinions, personal experiences, and conclusions remain the author's own.

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