A Vision for the Delivery of Skills, Vocational and Technical Education in Scotland

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1. Executive Summary

This paper from Professor Joe Little explores the future of skills, vocational, and technical education delivery in Scotland, considering the significant disruption driven by technological advancements, particularly AI, and other global shifts like climate change and changing demographics.

It discusses the role of futurism in preparing for uncertain futures, outlines potential future scenarios related to education and society, and examines the current landscape of colleges in Scotland in the context of these trends.

It looks at what is considered World-Class Vocational and Technical Education and makes recommendations for the sector to consider in planning ahead for the coming decade.

The structural policy environment in nations who are achieving World-Class VET include:

- College **priorities** driven by **government** in consultation with **business** bodies.
- **Alignment** with **economic** or **business growth** ministries. With economic growth being directly tied to the **provision of key skills** within the workforce.
- Recognition that the **college institution** is key to providing **essential national skills.**

- **International marketing** to supplement income or directly meet government skills demands.
- **Direct consultation with business bodies** both internationally and locally to meet their skills needs and supplement their own income making them significantly more **resilient** to financial challenges.
- Provide **hands-on skills development** alongside online **blended capability**, suited to both the **learner** and **employer**.

2. A Futurists Perspective on Skills, Vocational and Technical Education

This paper sets out to explore the **potential future landscapes** impacting Scotland's colleges, particularly concerning skills, and vocational and technical education (VTET) delivery.

I felt it important to understand first of all the science of futurism and if you prefer **Strategic Foresight** when looking at the future of anything. Strategic Foresight is something **expected of leadership** and yet the pressures of just keeping the lights on often starves leaders of the time to really look at what is happening in their sector, let alone what is happening **globally** that will eventually impact them.

Yet a lack of foresight is often cited as the principle **reason for collapse within companies** as key technological, societal, political, environmental, economical, legal and ethical signals and trends move to being mainstream and policy before the organisation has time to restructure or indeed pivot.

Therefore I think it is important to consider that **"The Future You Were Promised Has Been Cancelled"**, the one we believed would happen by now with flying cars, robot secretaries, cloud bases and lunar cities as predicted by “Tomorrow’s World” and other publications hasn’t happened but some of that did come about through other means.

Crucially - the skills and roles we see now all had a basis in signals 10 years ago and with **reasonable foresight** could have been prepared for.

However, I believe that the coming decade will be **profoundly disruptive** to traditional notions of the workforce, **how work is performed**, and the **necessary skills needed**.

A major driver of this disruption is the **exponential rise of AI** in various forms, impacting all sectors, from industry and research to the creative arts and in turn education and the acquisition of knowledge and skills.

Futurism is "not about prediction as there are no facts in the future". Instead, it is fundamentally "all about preparation for possible futures". Futurism involves looking for signals of the future, identifying patterns, trends, and drivers. Then exploring a range of possible futures that those elements may evolve into. Then planning for them. Futurists come from diverse backgrounds, including corporate strategists, government agencies, artists, educators, sci-fi writers, historians, technologists, entrepreneurs, game designers, and government advisors and have risen to around 10,000 globally.

The key process of building foresight involves 4 steps by:

- preparing (orienting to the future, identifying drivers and signals)
- foresight (drafting forecasts, exploring unexpected possibilities, drawing out consequences, envisioning alternative futures, articulating and personalising the future through headlines and artefacts)
- insight (riding the two curves, mapping cross-impacts, building resilience, prioritising actions)
- action (building roadmaps, testing and learning, rallying a network and identifying assets and gaps).

A 10 year horizon is considered optimal as within that time frame the future will be significantly different but within our own personal agency to change. Predictions beyond that tend to be too different to comprehend for the audience and the personal agency too far out to care enough to change.

Signals aren't always technological as some people may think but can be **S**ocietal, **T**echnology, **E**nvironmental, **E**conomical, **P**olitical, **L**egal, or **E**thical in nature. We must also pay attention to the overarching drivers of change which right now are easy to identify as the **climate emergency**, **social injustice**, **increasing economic divide**, **the dramatic impact of technology**, rising youth **mental health issues**, and the increasing frequency of **polycrises**.

In envisioning a range possible futures it is important not to be drawn to wholly utopian or dystopian outcomes as these rarely occur and often alarm but instead to use **Professor Jim Dator's 4 Alternative Futures Scenario Framework**[1], which provides four potential trajectories for the future:

Growth: Systems continue developing along their current path

Collapse: The current trajectory halts, and systems fall apart

Discipline/Constraint: New forms of restraint are imposed to prevent collapse

[1] 1. Dator's Four Futures – The Foresight Guide

Transformation: Entirely new systems emerge, transcending the present order.

These potential futures raise critical questions for education, specifically:

- What skills do we need to teach?
- What jobs will be available?
- What will the labour market want?

Back in 2022, to an audience of Scottish skills educators and administrators (DESG), I cited a statistic suggesting that "85% of jobs that will exist in 2030 haven't been invented yet"[2] and gave examples of jobs that existed 10 years prior (e.g. meter reader, TV repairs, assembly line workers), jobs that didn't exist 10 years prior (e.g. social media influencer, blockchain engineer), and jobs we can only imagine being around in 10 years (e.g. cultured meat farmers, robot field trainer, planet B scout, remote vehicle pilot) with a number of signals to support our thinking about future jobs: remote operations centers navigating ships from a building resembling a gaming arcade, to scenarios implying a huge influx of climate refugees, and the rapid growth of the space sector.

Jobs that existed 10 years ago and now gone/going	Jobs that didn't exist 10 years ago	Jobs we can only imagine being around in 10 years
Meter Reader	Blockchain Engineer	Quantum Programmer
Switch Board Operator	Mobile App Developer	Climate Change Scientist Robotic Design Architect
TV/VCR Repair Technician	Sustainability Manager	Spaceship Pilot Remote Vehicle Pilot
Electronics Assemblers	Cloud Computing Specialist	Blockchain crypto Specialist VUI/BCI Consultant
Video Store Manager/Clerks	Autonomous Vehicle Designer	Environment Ecological Artificial Intelligence Officer
Dictaphone Operators	AI/Big Data Analyst	Climate Refugee Centre Manager
Film Projectionists	YouTube Content Creator	Meat Addiction Counsellor Ambient Intelligence Experience Designer
	Social Media Influencer	Robot Field Manager Neuro-net Awareness Officer
		Nascent Data Harvester Planet B Scout
		Agribot Engineer

All of these were intended to demonstrate that **Scotland** would indeed be at the **center of significant skills needs** and **dramatic change** in the jobs and roles required in the future.

[2] Realizing 2030: Dell Technologies Research Explores the Next Era of Human-Machine Partnerships | Dell USA

At a macro level technology is set to significantly transform the jobs landscape with predictions from IFTF[3] and the Future Today Institute[4] laying out a futures landscape that implies we are already in a **Technology Super Cycle** nominally titled **Living Intelligence**, with the combined advancements in AI, the doubling of 'Internet of Things' connected devices (wearable, industrial and agricultural), and bioengineering potential (organoid Intelligence, bioprinting electronics, tissue engineering) being the key components that will transform how we view ourselves, our planet and our business and industry.

All of which lead to the conclusion that in the **next 10 years AI symbiosis will be a key skill** expected of all employers in much the same way that the use of calculator in the early 80s and symbiosis with the internet in the early 2000s were seen as key skills.

Our access to knowledge and skills have also significantly changed. Long gone are the days when verifying a key fact would require travelling to meet a **sage**, if you were lucky referencing the Encyclopedia Britannica that your parents invested in or travelling across town to the **library** and traversing the library coding system or **microfiches**. Indeed in the past 20 years we have had closer and faster access accelerate from encyclopedic CD-ROMs in our basement computers to hand held devices a metre away to wrist based and **eye based XR devices** offering AIs with instantaneous knowledge and skills.

This indicates a key shift in desirable skills **"From Know-It-Alls to Learn-It-Alls",** a theme explored recently by the Deloitte Futures team[5]. Where the thesis that machines will do most things humans already know how to do, suggesting the future belongs to those who are **adaptable learners**.

The employment "Waterline" we use to illustrate that core skills ("Dig Holes & Plant Seeds," "Animal Husbandry") are fundamental, but the "Waterline" representing the necessary **level of differentiated skills** has always risen, requiring a move from **depth to breadth**.

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[3] IFTF - The Future Is Wide Open
[4] https://ftsg.com/
[5] Future of Work | Deloitte UK

We've always been doing this as human beings for centuries and will continue to do so in order to survive. Teaching breadth, acquisition of a broad range of skills and an aptitude towards **lifetime learning** must become core going forward.

3. The Current Landscape for Colleges in Scotland

From an independent perspective there are several key issues and trends impacting **the landscape for colleges in Scotland:**

- There has been a **reduction in investment and in the parity of investment** for colleges despite previous recommendations in the Cumberford-Little[6], Fraser of Allander[7] and Withers reports[8].
- Limited debate about Higher Education investment levels for colleges within the university funding discussion.
- A **reduction in young people leaving school and entering Further Education** (FE).
- Lack of **clarity on priorities from the Scottish Government**.
- Uneven **engagement with businesses** and trade bodies.
- **Government funding addressing poverty issues at the grass roots only** but not necessarily focusing on skills for removing individuals from poverty.
- A lack of much needed **capital investment in buildings for safety and security.**
- Little headroom and poor policy conditions to develop **international engagement** nor incentive to do so.
- Limited and uneven college **alumni engagement.**

Yet there are significant drivers and trends impacting the sector and crying out for change.

With technological drivers predicting **AI transformationally impacting all arts, business and industries including education** (an estimated 48% of current jobs being eliminated or transformed in the next 20 years), acceleration in demand for **robotics, BioTech, NeuroTech, SpaceTech, renewable energy and climate tech skills**.

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[6] https://view.pagetiger.com/inlhij/1/PDF.pdf
[7] https://fraserofallander.org/publications/the-economic-contribution-of-colleges-in-scotland/
[8] Skills review published - gov.scot

There is also a trend indicating that the way work will get done will also change with a movement from appointments to key roles within a hierarchy of a large company to a **focus on tasks** that can be completed by a badged member of staff, contractor, gig-worker, AI or robot and a symbiosis of skills to identify and execute those tasks being key by 2033[9].

Scotland will also be hit by two further significant global drivers. Namely the **current climate emergency** with increasing severe climate events each year, lack of **building resilience** to climate events, little provision for **climate refugees** (Glasgow is currently the 4th more desired destination in the Cities@risk register[10]. Around the world, anywhere between 200m and 1 billion refugees expected to move in the next 20 years) and the rise of **youth mental health issues** already showing an impact in student dropout and a **significant increase in demand for Additional Support Needs support.**

[9] Global Workforce Hopes and Fears Survey 2024 | PwC
[10] Cities at risk - Lloyd's

4. Global Trends in Skills Teaching

In researching this paper and carrying out workshops with college sector leaders I investigated several futures databases and online feeds directly and indirectly impacting the sector and presented around 50 signals I felt should be front of mind for the leadership.

I also connected with a number of global skills experts in the UK, US, Germany and Asia. What struck me was that a number of global trends were impacting all of them and the necessity to evolve to meet these challenges was very much front of mind.

The drivers and trends that were specifically impacting VTET globally included:

- The increase in life expectancy and an aging workforce. This necessitates lifelong learning, with employees potentially needing to re-skill or up-skill multiple times over careers that could last 60 years or more (around 3-5 times with Deloitte predicting up to 12 times).[11]

- With that in mind employers are seeking alternative online and micro-credentials to retain workers in the workplace and manage costs. Gone are the days when major employers held week long skills courses in dedicated training centres.

- A common theme was that students are increasingly sensitive to the rising costs of full-time education and increasing personal economic pressures.

- In addition to employers recognising the importance of neurodiverse employees in the workforce there is a rise in the need to support learners with Additional Support Needs (ASN).[12]

- To meet this demand a number of commercially available personal skills platforms, mobile learning platforms, and employer skills assessment platforms are emerging for employers and employees.

An additional and striking trend is that universities and colleges are increasingly using online course delivery platforms to extend their reach globally and provide an alternative commercial income stream at considerably less cost.

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[11] Skills-based organizations | Deloitte Insights

[12] Meeting the support needs of learners in Scotland's colleges | National thematic inspections | HM Chief Inspector reports and guidance | Inspection and review | Education Scotland

Further trends[13] were found following the success of "Serious Games"[14] and the rise of immersive VR/AR training platforms which are finally moving beyond just medical and military skills and finding success in other less obvious sectors where physical training is either risky, costly or simply unsafe to provide. Supporting that are increasingly more micro-credentials platforms being preferred by trade bodies as a mechanism for certification and qualifications.

Globally, commercially focused colleges are rebalancing their focus towards major employers (local and international) for financial viability, and some are closing physical buildings in favour of online digital and hands-on-skills centres.

The trend is moving from lectures to immersion, mentoring, AI integration, and then practical application - described as "blended by default".[15]

[13] (PDF) Global Trends in Vocational Training Education: A Bibliometric Analysis
[14] Game-Changers: 18 Serious Games That Changed the World - Growth Engineering
[15] (PDF) Hybrid and Blended Learning Models: Innovations, Challenges, and Future Directions in Education

5. What World-class Vocational, Education and Skills Teaching Looks Like

As with the “Entrepreneurial Campus Blueprint” policy document I was keen not to overly focus on the current best practice within Colleges in Scotland but to look at what is considered **"World Class VTET Delivery”** as I believe that provides more valuable benchmark and context to the organisations who will already be aware of their strengths and weaknesses. Through a number of interviews and research I discovered a series of key attributes of these institutions:

- College **priorities** driven by **government** in consultation with **business** bodies.
- **Alignment** with **economic** or **business growth** ministries. With economic growth being directly tied to the **provision of key skills** within the workforce.
- Recognition that the **college institution** is key to providing **essential national skills.**
- **International marketing** to supplement income or directly meet government skills demands.
- **Direct consultation with business bodies** both internationally and locally to meet their skills needs and supplement their own income making them significantly more **resilient** to financial challenges.
- Provide **hands-on skills development** alongside online **blended capability**, suited to both the **learner** and **employer**.

6. A Personal View of the Future of Scotland's Colleges

Throughout this research of the college sector both historically and current state, locally and globally it became clear to me that the sector in Scotland is in **distinct decline** with little chance in the current paradigm to become a growth sector unless it becomes **sustainable with investment** and makes a **significant change from within**.

The current 24 college structure, with most colleges struggling to survive year-on-year and only a few content with their current status and almost no reward for innovation and commercial entrepreneurship within the institutions has led me to the conclusion that a new model is needed that will deal directly with the issues constraining the 24 colleges and provide a more hopeful future for the sector and indeed move from **"survival mode"** to **"recognised as world-class**".

For colleges:

Provide a More Engaging and Compelling Skills Offering for Students: Colleges should offer a more attractive alternative to expensive university programmes for school leavers, providing **globally recognised skills attainment.** This includes offering **blended training options** better **aligned to educational and special educational needs.** Courses should be immersive, interactive, and engaging, building confidence for real-world work. Colleges should also build **entrepreneurial and intrapreneurial skills** to cope with the increasing need for successful start-ups and foster the soft skills needed for success in all businesses. The aim being to produce **confident, innovative workers** who build connections and businesses and become **proud alumni** willing to return as **practitioners** to mentor and **share real-world experience**.

The importance of a **Digital Learning Resource Centre** is essential to success of this whole sector, providing technical **support for digital transformation**, managing online platforms, developing immersive training environments, training staff, supporting AV suites, and scanning for new technologies. Becoming **future proof** and **"Digital by Default."**

For the sector voice:

The voice for colleges should be stronger with the Scottish and UK government, industry bodies, international governments and to the students and alumni. This would look like more advocacy with Scottish and UK government, lobbying for clear priorities **aligned with economic growth**, building a case for increased skills training based on **national priorities**, and lobbying for a more **sustainable multi-year funding model.**

One voice advocating for **sustainable skills provision** that is recognised as **world-class within 10 years**, setting out the need for a **skills college** for college staff which provides high quality professional development in new technology and ways of teaching and in turn up-skill themselves, and providing a centralised place that's developing world-class digital classes **aligned to the market needs of employers and students which are shared across the sector**.

Providing expertise to all colleges will help to support them in being **resilient** to the global **climate** change emergency, **financially resilient** to governmental and global changes, and it could carry out the constant task of reviewing global signals and **adapting for the future**. This could come under a brand such as **Future Skills Scotland**, **Scottish Colleges Alliance**, **World-Class Skills Scotland** or **Scottish Centre for Future Skills Excellence**. In doing so it would become a more attractive brand to all parties, provide the resources and digital needs to transform efficiently. This organisation could also:

Provide a centralised focus with Industry and Business, more powerfully representing colleges with national businesses and trade organisations, agreeing priorities for skilling/up-skilling workforces, developing **modern blended learning approaches matching employer needs** (accreditation, safety, regulatory), and using **best-in-class digital tools** via a centralised team supporting all colleges in their deployment. The goal being to become the **skills centre of choice** by constantly reviewing global best practices.

Provide a More Effective and Cost Efficient Representation Internationally: More powerfully representing colleges internationally, marketing the **"Scotland College Brand"** to develop **world-class training** (e.g., engineering, maritime), recruiting international students to Scotland as a **respected vocational skills provider**, and engaging with **international governments** and partners on skills needs. Some colleges have shallow or no resources to do this currently.

Conclusion

My view is that a new model is needed for Scotland that will deal directly with the issues constraining the 24 colleges and provide a more hopeful future for the sector and indeed move from “survival mode” to “recognised as world-class”.

There is a wealth of evidence on global signals and trends for learners, employers and education and training providers. It is clear that these trends will impact Scottland’s students, college staff and colleges as these are truly global changes which are taking place and it would be remiss to think these changes will pass Scotland by. Preparing, being ready to change, and being able to change, are key to success. This will take place in challenging circumstances however because of the lack of available investment.

I would recommend that as much support as possible is afforded to Scotland’s colleges politically, and that colleges work together closely, to achieve success and economies of scale in delivering results for students and society. Colleges have always played a vital role in Scottish civic life and there is a bright future for Scotland’s colleges if far more strategic ambition is put towards their success.

Attribution

Professor Little was commissioned by Colleges Scotland to research global trends and signals in vocational educational delivery which was presented in two workshops to college sector leaders in Spring 2025.