HEA | An tÚdarás um Ard-Oideachas
The Higher Education Authority

Background Paper for Higher Education Authority – Strategic Directions: Future Challenges and Considerations.

Professor Marie Clarke, School of Education, University College Dublin on behalf of the HEA.

June 2026

Acknowledgements

A number of people made invaluable contributions in the preparation of this consultation document. Mr Tim Conlon generously shared his strategic perspectives and advice throughout the process. Ms Linda Darbey through her coordination and direction, with the support of Dr Louise McAteer, provided extensive support at each stage of development, in sourcing data on recent and future trends, and for providing support on the finalisation of the paper for publication. Dr Jemimah Bailey through her work and insights in relation to the analysis and conclusions strengthened the final document. Members of the Higher Education Authority Board generously shared their time and feedback during the drafting phases. Their collective expertise has been vital in shaping this background document to support meaningful future consultation.

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Glossary

AI	Artificial Intelligence
CSO	Central Statistics Office
D/FHERIS	Department of Further and Higher Education, Research, Innovation and Science
DkIT	Dundalk Institute of Technology
DORA	Declaration on Research Assessment
EC	European Commission
ECB	European Central Bank
ERA	European Research Area
EU	European Union
GER	Gross Enrolment Ratio
GERD	Gross Domestic Expenditure on Research and Development
GNI	Gross National Income
HE	Higher Education
HEA	Higher Education Authority
HEI	Higher Education Institution(s)
IADT	Dún Laoghaire Institute of Art, Design and Technology
ICT	Information Communications Technology
IoT	Institutes of Technology
KTI	Knowledge Transfer Ireland
MIC	Mary Immaculate College
MNC	Multinational Corporation(s)
MoU	Memorandum Of Understanding
MTU	Munster Technological University
NDP	National Development Plan
NPF	National Planning Framework
NESC	National Economic and Social Council
OECD	Organisation for Economic Cooperation and Development
PRTLI	Programme for Research in Third-Level Institutions
QUB	Queen's University Belfast
R&D	Research and Development
SME	Small and Medium Enterprises
TPFR	Total Period Fertility Rates
TU	Technological University
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organisation
VR	Virtual Reality
WEF	World Economic Forum
XR	Extended Reality

1. Introduction

In the context of strategy development and policy formation anticipating future trends is complex. This is especially the case in higher education. In addition, the policy process is an interactive one (Muller, Maassen, & Cloete, 2006), complicated by many factors outside the policy intention, including the nature of available evidence and the role that stakeholders play in the policy formation context (Clarke, 2023). Government and Higher Education Institutions (hereafter HEIs) responsiveness to stakeholders does not evolve simply and functionally; it is also influenced by the networks of relationships in which they are situated. At the macro-level, there are national systems, at a more meso-level, there are relationships between key government actors and the higher education (hereafter HE) sector in which the system is funded in return for the delivery of outputs, and at the micro-level, where HEIs work with community stakeholders in specific contexts (Benneworth & Jongbloed, 2010). The complexity of stakeholder involvement in policy formation is underscored by the fact that stakeholders form expectations around a given set of rules, and their responses to change can be unpredictable. According to Balbachevsky (2015), prominent stakeholders tend to seek alliances with other stakeholder groups who hold similar beliefs so that they can shape their preferences and policy alternatives. This, in turn contributes to the political dynamics that characterise a policy system. More recently, Langrafe et al. (2020) have demonstrated that instead of focusing on which stakeholders are the most important and prioritising their demands, emphasis has now shifted to improving relationships to foster public value. Understanding the policy context is key to understanding the potential impact of future trends on the system.

In 2017, the Higher Education Authority (hereafter, HEA) published a discussion paper titled *Higher education futures: which issues and trends are most significant for Ireland and the HEA?* for its 7th HEA Forward-Look Forum. The emergent themes from that paper informed the HEA Strategic Plan 2017-2021. Projecting forward to 2050 reference was made to EU forecasts about global demographic and societal challenges; energy and natural resource security and efficiency/environment and climate change; economy and technology prospects; geopolitics and governance; territorial and mobility dynamics; and research, education and innovation. The paper acknowledged that while the trends were each

individually significant; they did not exist in isolation – and would not occur at an equal pace across the world (Higher Education Authority, 2017).

In recent years considerable change has taken place in the Irish HE sector. The Department of Further and Higher Education, Research, Innovation and Science (hereafter D/FHERIS) was established in July 2020. It is responsible for HE strategy and policy, gives direction to the HEA and allocates resources to the HE sector. The HE sector is governed by a range of legislation, including:

- Irish Universities Act, 1997
- Technological Universities Act, 2018
- Institutes of Technology Act, 2006
- Higher Education Authority Act, 2022
- Qualifications and Quality Assurance (Education and Training) Act, 2012
- Charities Act, 2009
- Ethics in Public Office Acts (1995, 2001)
- Freedom of Information Act (2014)
- Protected Disclosure Acts (2014, 2022)
- Equal Status Acts, Disability Acts & Employment Equality Acts
- Official Languages Act (2003, 2021)
- Data Protection Acts and EU GDPR obligations
- Research and Innovation Act, 2024
- Regulation (EU) 2024/1680 (harmonised rules on Artificial Intelligence)
- Student Support Act, 2011

The establishment of the Technological University (hereafter, TU) sector and the consolidation of initial teacher education across colleges and universities marked a significant change in the Irish HE context. As of 2022, there are currently five designated technological universities in Ireland: Technological University Dublin was established on 1 January 2019; Munster Technological University (MTU) was established on 1 January 2021; Technological University of the Shannon: Midlands Midwest was established on 1 October 2021; Atlantic Technological University was established on 1 April 2022, and South East

Technological University was established on 1 May 2022. A TU represents a combination of the university system and the tradition of institutes of technology (IoTs) from which TUs were born (Dwyer & Seery, 2024). TUs are viewed as rooted in their regional contexts, addressing local community, national, and international needs, policy, education and research (Technological Universities Research Network, 2019), and are at a nascent stage in their development. One of the two remaining Institutes of Technology (IoT), Dundalk Institute of Technology (DkIT), recently entered into a Memorandum of Understanding (MOU) with Queen's University Belfast (QUB), which will see DkIT become a university college of QUB. The Institute of Art, Design & Technology, Dún Laoghaire (IADT), is working to define its future position within the Irish higher education and tertiary system, cognisant of the nature of higher education in the creative industries, and their importance to social, cultural, and economic life, nationally and internationally.

Following the recommendations of the Report by the International Review Panel on the Structure of Initial Teacher Education (2012), a period of consolidation and innovation resulted in the creation of centres of excellence in initial teacher education with the establishment of the DCU Institute of Education comprising St. Patrick's College, Mater Dei Institute of Education and the Church of Ireland College (2016); the incorporation of Froebel College into Maynooth University; and an MOU between the University of Limerick and Mary Immaculate College (MIC).

The HEA Act 2022 increased the powers of the HEA as a regulator tasked with holding HEIs to account for their performance and for securing value for money in the use of funding. In 2026, the HEA's strategic objectives must be considered in the context of other government policy papers such as *Programme for Government 2025*; *the National Development Plan (NDP)* (2026–2035), *National Planning Framework (NPF) Revision* (April 2025), Project Ireland 2040, Action Plan for Competitiveness and Impact 2030, the *Circular Economy Strategy* (2026–2028), the *Shared Island Initiative* and *The Roadmap for Social Inclusion* 2020-2025; *Research Ireland Strategy Curiosity, Capability, Competitiveness – Charting Ireland's Research and Innovation Future* 2026–2030, *Global Citizens 2030 Ireland's International Talent and Innovation Strategy, System Performance Framework 2023-2028, Ireland's National Skills Strategy 2025, The National Access Plan 2022-2028, Funding the Future: Investing in Knowledge and Skills: Ireland's competitive advantage, 2022, Statement of Strategy 2025-2028, DFHERIS,* and the forthcoming *Tertiary Education Strategy.*

This paper considers the literature on megatrends and explores recent developments in industry, work patterns, and higher education in both the global and Irish context. Areas such as research, future population projections, resourcing needs of the system, and policy development are also considered.

2. Mega Trends

Strategic foresight methodologies have grown in popularity (Malik & Janowska, 2019). Megatrends as a concept was first introduced by Naisbitt (1982) and more recently was defined by Naughtin et al. (2024) as:

> *A megatrend is a significant driver of change that is likely to have transformative impact on individuals, organisations and societies. Megatrends typically develop over a period of years or decades and occur at the intersection of multiple political, environmental, social, technological, legal and/or economic trends.*

Megatrends do not predict the future and should be viewed as a best guess based on current evidence or as a lens to help people identify larger impactful issues (von Groddeck & Schwarz, 2013). Megatrends are used by governments, companies, and international agencies to anticipate changes that are shaping and reshaping the local, regional, and global strategic landscape (Jeflea, et al., 2022). They are framed using a variety of methodologies: literature reviews and expert panels, workshops, interviews, questionnaires, environmental scanning, and modelling (Popper, 2008). The methodological variability underpinning megatrends makes it difficult to compare the results across different analyses or track the evolution of specific megatrends over time to evaluate their accuracy (Malik & Janowska, 2019). The lack of a common methodology and theoretical basis also limits the credibility of megatrends as a fore-sighting tool and their ability to drive meaningful action (Wright, 2020). Notwithstanding these challenges, several well-recognised frameworks have been developed in the field. The DRIVE framework (Esposito & Tse, 2018) focuses on five generic megatrends (demographic and social changes; resource scarcity; inequalities; volatility, scale, and complexity; and enterprising dynamics). The Organisation for Economic Cooperation and Development (2018) [hereafter OECD] developed a megatrends framework around four key categories (i.e., people, the planet, productivity, and polity) (OECD, 2014; 2018). The European Commission's (hereafter EC) Joint Research Centre established the Megatrends Hub, a repository of 14 broad global megatrends that organisations can use to assess future impacts on a chosen topic (Störmer, et al., 2020). The 14 megatrends identified are Accelerating technological change and hyperconnectivity; Aggravating

resource scarcity; Changing nature of work; Changing security paradigm; Climate change and environmental degradation; Continuing urbanisation; Diversification of education and learning; Widening inequalities; Expanding influence of East and South; Growing Consumption; Increasing demographic imbalances; Increasing influence of new governing systems; Increasing significance of migration and Shifting health challenges.

The company Diplomatic Courier World in 2050 is a global action platform funded through a combination of corporate partnerships, private sector sponsorships, and collaborative initiatives with international organisations. Their Megatrends framework maps the major anticipated forces reshaping society: global shifts in technology, geopolitical power, demographics, and the environment. Their map is valuable as they identify a number of sub-trends under each megatrend.

The first mega trend in the Megatrends framework is **exponential technologies,** which will radically reshape the world from AI to quantum to biotech, and which they contend will rewire the architecture of society. They conclude that we are now in an era where whoever masters the code shapes the future. In addition to this megatrend, they identify sub trends such as fragmented futures, post-human possibilities: where emerging technologies blur the line between machine and mind; a data dominion era where power lies in ownership and weaponised innovation where defence-tech investment is rapidly gaining ground.

The next megatrend is **disruption from climate change and energy transition**. As governments retrench in an era of poly-crisis (war, inflation, fragmentation) climate ambition is being eroded. The sub-trends in this area include the rise of the outsiders where grassroots coalitions start addressing these issues, gridlock vs. gigawatts, where climate change initiatives cannot be successfully scaled in a world experiencing migration and war; fossil futures in flux as fossil fuels are being phased out, and meeting global energy need is harder to predict. This is accompanied by a rise in nuclear power.

The third megatrend is **education and work**. They argue that education and labour are undergoing significant recalibration. In this megatrend the next frontier is not just skilling up for the future but redefining what learning and labour mean in an age of disruption. The sub trends identified include: the role of AI in reshaping the fabric of economic and social life bringing tremendous creativity or displacement of industries and work patterns, the next sub trend identified is the perpetual learning loop in a world where skills expire faster than

diplomas and lifelong learning is no longer optional, but a means of survival, and in a context of global displacement education and labour systems struggle to adapt to a mobile, shifting human workforce. Another sub-trend concerns what they term a vanishing reform spotlight, where efforts to transform education systems are eclipsed by more urgent crises.

The fourth megatrend focuses on **individual and societal wellbeing** which are at an inflection point. The COVID-19 pandemic exposed the fragility of even the most advanced public health systems, and the Global South faces escalating demand with too few resources. As climate shocks, migration, and mental health crises converge, humanity stands at a point where it needs to reimagine wellbeing, or watch it unravel. The sub themes identified are holistic models of wellbeing (mental, emotional, spiritual, and environmental), frontline futures from pandemics to heatwaves where public health is becoming a core pillar of global security and societal resilience where health tech is flipping the script and empowering individuals with real-time data, AI-driven diagnostics, and decentralised care models.

The fifth megatrend examines the **pressures that societies face**. Fractured societies, eroded public trust, and outdated governance models are colliding with crises too complex for any one actor to solve. As liberal systems face backlash and global cooperation frays, the challenge is no longer just reform; there is a need to redesign. The sub-trends identified under this megatrend focus on: trust collapse: institutional legitimacy is unravelling as polarisation and misinformation fuel widespread disillusionment, democracy is in retreat: the global pivot away from liberal institutions is eroding long-held norms and opening the door to authoritarian resurgence, new models of collective action and migration flashpoints: geopolitical instability and climate disruption are turning migration into a political and moral fault line. Each of these megatrends are potentially impactful on the role of higher education systems in the future.

3. Future Scenarios in Higher Education

The literature on future scenarios on higher education adopts several different approaches (Blankesteijn & Ghorbani, 2025). The OECD (2009) identified several future scenarios for higher education in the context of globalisation. The first included open networking, (international cooperation and extension of the Bologna process), and open knowledge sharing (leading to global and participatory universities). The second focussed on the need for higher education to concentrate on local needs and security, (reflecting fears of migration and loss of identity). The third new public responsibility assumed that an era of fiscal austerity and aging populations would drive efficiency reforms (competitive funding, accountability, and university quasi-market incentives) and the fourth, Higher Education Inc. was predicated on a market-dominated transnational sector through trade liberalisation, private providers, and international student mobility.

The British Council (2022) focussed on three scenarios, their Core Scenario*, Adjusting to a Changing World,* envisaged a moderately globalised future where higher education would adapt to ongoing worldwide demographic and economic shifts, remaining open yet under pressure. Their alternative Scenario A pointed to *A More Insular World* in the context of heightened nationalism and restricted academic mobility, and their alternative Scenario B, *Open and Inclusive*, predicted a highly collaborative global system with a free flow of students and knowledge (Blankesteijn & Ghorbani, 2025).

Adopting a different focus, Naude & Sutherland (2024) explore the future of learning and teaching models in higher education. They envision four learning models for 2030. The first, a highly human–embraced, single-career educational approach akin to a traditional model but enhanced with technology. The second, a machine-embraced, multi-career model where AI and virtual reality support personalised, lifelong multi-skill trajectories. Their research indicates that millennial parents are broadly open to such innovations (hybrid formats, regulated screen time, etc.), suggesting a positive shift in attitudes. Digitalisation is viewed as the major driving force (VR/AI integration) (Blankesteijn & Ghorbani, 2025). Other authors also consider future learning scenarios and pathways. Orr et al. (2019) identified

four main ones, which they labelled *Tamagotchi, Jenga, Lego* and *Transformer*. In the *Tamagotchi* scenario, the university functions as a closed eco-system that supports and guides students as they pursue a course of study. This scenario is particularly well-suited to students who progress from school to university or college. The *Jenga* scenario envisions a first-degree programme that offers a solid foundation of knowledge and competences and can take the form of a shortened study programme. The curriculum builds on this foundation and is constantly expanded by the learner (student) through new learning blocks. These additional blocks are made available by different training providers. In the *Lego* scenario, the course of study is no longer completed as a compact unit at a university or college but consists of individually combined modules of different sizes from different training providers. The learners themselves decide which learning phases or units they want to complete. In the *Transformer* scenario, the students do not transfer directly to higher education as school-leavers but acquire their own professional identities and life experiences attending university or college later in life and integrating their life experience into their studies. They need flexible courses of study that alternate between didactic control by teachers and advisors, and their own self-determination. These scenarios raise questions about institutional support, governance, and quality assurance, as well as issues involving institutional financing for restructuring and infrastructure. They also impact significantly on the organisation and activities of universities and colleges, as well as on higher education policy and governance (Orr, et al., 2019).

Other authors have offered similar scenarios about learning pathways. Gering, et al. (2022) envisioned four futures: *Fixed–Micro* programmes*, Flexible Micro* programmes*, Fixed Holistic* programmes, and *Flexible Holistic* programmes. In the *Fixed-Micro* programmes higher education is delivered in standardised, one-year skill programmes (mass education meeting labour market demands with tightly set content). In the *Flexible–Micro* programmes, universities and alternative providers share a market of agile short courses, offering on-demand skills with greater choice and timing flexibility. The *Fixed–Holistic* programmes, is a continuation of the status quo, with traditional multi-year degrees remaining predominant, with gradual pedagogical evolution. The *Flexible–Holistic* programmes, envisions a future where degrees still exist but are highly customisable, allowing students to curate their coursework and pace, accommodating diverse needs, and lifelong learning within formal structures (Blankesteijn & Ghorbani, 2025).

Focusing on infrastructure and the university campus, Akcaova et al. (2024) identified four scenarios by 2040. These were: the *Growth* scenario, which assumes that current trends continue; campuses remain recognisable but are enhanced by extensive digital integration (e.g. XR/VR in classrooms and personalised learning analytics) to enrich student experiences. The *Discipline* scenario envisions a future where human-centric learning is preserved through strong regulatory limits on technology use—campuses are safe, structured environments which are focused on student well-being. The third scenario, *Transformation* explores a reimagining of the higher education space: perhaps decentralised or virtual campuses, or fundamentally new models of campus-community interaction, reflecting a radical yet plausible shift in how/ where learning occurs. The *Collapse* scenario imagines universities in retreat—physical campuses shrinking or decaying as big technology companies and fully online platforms overtake educational functions, leaving traditional universities underfunded and peripheral. In all scenarios, globalisation, digitalisation, funding, and policy are key factors influencing the future status of higher education (Blankesteijn & Ghorbani, 2025).

Across the literature, higher education institutions are key drivers of future society (Blankesteijn & Ghorbani, 2025). Universities are increasingly seen not only as knowledge providers, but also as active change agents in addressing societal challenges. Sporn & Godonoga (2024) emphasise the social dimension of universities and their responsibility to adapt and impact their communities. This perspective aligns with a broader discourse that universities must justify their societal relevance by tackling issues such as social inequality, technological disruption, and global sustainability. The value of universities will be measured by their impact on future society outcomes, including economic innovation, social cohesion, and environmental sustainability, which go beyond their traditional teaching and research missions (Blankesteijn & Ghorbani, 2025).

In UNESCO's vision of a new social contract for education, higher education is tasked with assuming greater responsibility in areas like climate action, public health, and civic education (UNESCO, 2021a). This will according to Sporn & Godonoga, (2024) will require universities to expand their third mission (service to society) by forging new partnerships with government, industry, and civil society to address societal challenges directly. Recent literature calls for closer university-business-government collaboration to ensure that higher education keeps pace with economic and social change (Cai & Lattu, 2022). The literature

suggests that in 2040 higher education must be deeply interwoven with societal development: universities are expected to educate not just job-ready graduates but responsible citizens and innovators who can work within and improve a rapidly changing world (Devaux, et al., 2019). For Blankesteijn and Ghorbani, (2025) understanding possible futures for universities is essentially about understanding futures for society at large. The evolving relationships between industry, work patterns, and education will play a key role in those future societal developments.

4. Industry, Work Patterns and Higher Education

The relationship between industry, work patterns and higher education is considered in a vast body of literature. It should be noted that much of the debate about the relationship between these areas and higher education is informed by the dominance of Human Capital Theory, which has been widely critiqued and debated. Marginson (2026) argues that work and higher education are different kinds of social sites, each with their distinctive history, requirements, daily practices, subject-positions, rhythms, and drivers. Some parts of higher education are in an explicit continuum with work (e.g. programmes that train professionals such as doctors, teachers), and many higher education programmes have occupational content. Students and graduates, HEIs, professions, and employers often make strenuous efforts to connect education and work. However, for Marginson (2026) the linear transition imagined in the human capital narrative does not describe higher education/work connections, as relations between the two domains are multiple, context-bound, fragmented, uneven, and must be continually developed.

In seeking to understand trends and developments in the areas of industry, work, and education, efforts have been made to categorise different periods of development. The literature on industry tends to frame industrial development as industrial revolutions, currently categorised as Industry 1.0 to 7.0. Work patterns and educational developments have been classified in a similar way.

Industry 1.0, dating from the 18th century, focuses on mechanisation arising from the invention of the steam engine. The **second industrial revolution**, in the late 19th century was marked by assembly lines and mass production allowing industry to scale in a global context. **Industry 3.0** emerged in the latter part of the 20th century with the development of computers, early robotics, and digital automation. The second decade of the 21st century witnessed the emergence of **Industry 4.0**, the rise of automation, artificial intelligence (AI), and cyber-physical systems, which has resulted in rapid digital development across a range of areas. **Industry 5.0** has emerged as a new vision for industry which prioritises societal value, placing worker well-being at the centre of production while respecting planetary

boundaries and using advanced technologies to find solutions to global challenges (Directorate-General for Research and Innovation, 2021; Gola, Ratnayake, & Krajčovič, 2025). **Industry 6.0** was first proposed in 2022 and is expected to reach maturity by 2032. It centres on bio-digital convergence between semi-autonomous robotics and human labour. **Industry 7.0** emerged in 2024 and is not expected to be realised before 2050. The focus of this revolution is expected to be on self-regulating industrial ecosystems that balance economic output within planetary limits, marked by artificial-general-intelligence architectures, where natural organic AI systems will learn continuously from ecological, economic, and social streams. It should be noted that it is not clear how AI will impact on industry in the medium to longer term. Autor & Thompson (2025) argue that the impact of AI on jobs will depend on how future AI systems are designed and that well-designed systems could be fashioned to enhance, rather than *displace,* human creativity and productivity – creating new, wage-enhancing "expert tasks". This would, in turn, imply sustained demand for highly educated workers.

Society 1.0 to 5.0 is also classified in similar way. This framework captures changes in society: **Society 1.0** (hunter-gatherer), **Society 2.0** (agricultural), **Society 3.0** (industrialised) and **Society 4.0** (information). The current **Society 5.0** is called the 'super-smart society' (UNESCO, 2024). Working patterns are generally described using a similar framing to the industrial revolutions. The move from working at home to working in factories, to using computers to **Work 4.0** (the Internet of Things) are all directly linked to the industrial revolution patterns. **Work 5.0** emphasises continuous learning and reskilling as fundamental to helping workers thrive alongside intelligent machines (Oeij, et al., 2023). The literature suggests that the workforce is not fully prepared with the skills required for emerging **Industry 5.0** jobs. **Work 5.0** foresees jobs redesigned such that humans work alongside AI decision-support systems or robotic assistants, which requires co-designing work tasks to achieve optimal human-machine synergy (Chigbu & Makapela, 2025).

In some research educational developments are framed in a similar way to the industry and work revolutions (Shukla, Singh, Sonwani, Dixit, & Gupta, 2025). After the first industrial revolution, the education sector proliferated, beginning the period of **Education 1.0**. that resulted in the emergence of enabling technologies such as the paper-making machine, mechanical printing, the graphite pencil, the ballpoint pen, and the typewriter (Miranda, et al., 2021). The educator was seen as a sage, and the student had a mostly

passive role. **Education 2.0** coincided with the second industrial revolution characterised by mass production, industrialisation, and electricity, where libraries and printing machines provided open resources to the educator, but the student remained a passive recipient. **Education 3.0** emerged in the third industrial revolution and revolved mainly around computerisation, automation, and control. In this new communication era teaching-learning processes were supported by multiple resources such as multimedia, online tools, and virtual laboratories (Miranda, et al., 2021). In this context, the educator was considered an orchestrator, curator, and collaborator, and the students were empowered to build their knowledge. Knowledge generation in **Education 4.0** aligned to the fourth industrial revolution moving towards an approach that combines heutagogy (self-learning), peeragogy (peer learning), and cybergogy (learning within virtual, online, or technology-enhanced environments) where collaborative learning is promoted. Education 5.0 has gained currency as a forward-looking framework for reimagining learning in the age of intelligent machines and societal change (Shahidi Hamedani, Aslam, Mundher Oraibi, Wah, & Shahidi Hamedani, 2024). It builds on **Education 4.0** (the digital and personalised learning paradigm aligned with **Industry 4.0**) and extends the model by integrating AI and data-driven tools with humanistic pedagogies that emphasise creativity, emotional intelligence, and lifelong learning (UNESCO, 2021b). **Education 6.0** is a future vision to 2035 which identifies immersive ecosystems using AI, AR, VR, and adaptive learning systems for global collaboration (Mystakidis, 2022). **Education 7.0** is a vision to 2050 which promotes a human-centric AI future where highly autonomous AI ecosystems and blockchain-based credentialing are combined with an emphasis on creativity and ethics as core human capacities (Mystakidis, 2022). These developments present several challenges for teaching and learning activity in higher education.

While the signature pedagogies of disciplines are well documented (Shulman, 2025) a considerable body of literature (Jarni & Gurr, 2024) focuses on good teaching practices in the context of rapid technological advancements and the promotion of student learning engagement. Kukulska-Hulme et al. (2023) explores pedagogies using AI tools; metaverse for education; multi-modal pedagogy; entrepreneurial education; relational pedagogies; and entangled pedagogies of learning spaces. The need for evidence-informed practices in relation to these areas is vital in meeting the needs of disciplines and enhancing student learning.

Jani and Gurr (2024) identify a number of issues that need to be addressed in future teaching practices. These include *next practice*: where there needs to be a stronger focus on the curriculum that deals in matters of ethical reasoning and critical thinking, where the lines between human and machine become blurred; *clarity*: strengthening the focus on macro learning pathways and designing courses which allow for personalised automated learning experiences, along with a vision of how these are connected and orchestrated with a human focus*; activating learning* ensuring the focus remains on deep learning; learning relationships where the social and emotional dimensions of learning are recognised and respected in digitally mediated environments; *self-regulation:* where students are taught how to learn, unlearn, and relearn (Toffler, 1990); and *feedback:* how feedback is effectively designed and 'distributed' rather than delivered in multi-modal environments where the dialogic process (Price, Handley, & Millar, 2011) of feedback is two way, supporting the learner to become better equipped to develop deeper insights and understanding.

Chigbu & Makapela (2025) have developed a framework connecting industry, education, and work patterns to highlight the commonalities between the areas and how each must contribute to one another. They argue that as industries transform and new technologies emerge, the skills required in the workforce are changing rapidly. **Industry 5.0** and **Work 5.0** highlight the need for workers who are not only technically proficient in working with advanced technologies (automation, data analytics, AI, etc.) but who are also adaptable, creative, and equipped with strong social and cognitive skills (Chigbu & Makapela, 2025). **Education 5.0** is about reorienting education systems to prepare individuals for this future – developing talent that can thrive in and shape the new landscape of work (Chigbu & Makapela, 2025). While demand for basic cognitive and manual skills might decline with AI automation, demand is rising for complex problem-solving, critical thinking, digital literacy, and the ability to work alongside AI skills that are not traditionally taught to a sufficient extent (Vuori, Burkhard, & Pitkäranta, 2025).

The World Economic Forum anticipates that analytical thinking and creative thinking are expected to remain the most important skills for workers, even as technical skills in AI and IT grow in prominence (World Economic Forum, 2023). Some universities are beginning to implement **Education 5.0** strategies by introducing programmes in AI ethics, human–computer interaction, and sustainability, ensuring students acquire knowledge (Seeling, Roberts, & Weible, 2022) in technology and its societal context. **Education 5.0** advocates for

closer partnerships between educational institutions and industry so that curricula will remain relevant to industry trends and provide students with hands-on experiences (through internships, apprenticeships, and co-op programmes) that build job-ready skills. **Work 5.0** emphasises the need for continuous upskilling and reskilling of the existing workforce. In a **Work 5.0** scenario, learning is not confined to the early years of life but occurs over the lifespan, supported by employers and society (Anthuvan & Maheshwari, 2025).

The intersections between industry, education, and work patterns are also being considered in the policy context (OECD, 2023). Demand for advanced adult learning will increase as technology drives changes, and individuals will work for longer in aging societies. Although take-up of adult learning opportunities generally remains low in OECD countries, efforts are underway in many countries to strengthen the culture of lifelong learning and increase the range of upskilling and reskilling opportunities available. The advanced skills required for many occupations mean higher education has an important role to play in this evolving landscape, even though existing efforts to develop new upskilling and reskilling offerings are still in their early phases (OECD, 2023).

Clear pathways for adult learning and career transitions are needed, requiring collaboration between educators, industry leaders, and policymakers (Chigbu & Makapela, 2025). However, many higher education systems are resource constrained, there are infrastructure gaps, and there are the associated risks of fragmentation in terms of quality assurance and the exacerbation of credentialism. Market-led skill agendas can sideline civic, ethical, and foundational learning if not counter-balanced by public interest goals (Chigbu & Makapela, 2025).

UNESCO's *Futures of Education* (2021) calls for a new social contract in education that would ensure education, knowledge, and innovation are mobilised to create sustainable and just futures, implicitly recognising the need for education systems to keep people employable and capable of driving positive change (UNESCO, 2021c). This will require a new paradigm of policy integration – a recognition that economic development, educational advancement, and labour welfare must be pursued in unison within ethical and transparent frameworks (Chigbu & Makapela, 2025).

4.1. Industry, Work Patterns and Higher Education in the Irish Context

Future Forty (2025) a report published by the Irish Department of Finance, analyses Ireland's long-term economic, demographic, and fiscal trajectory until 2065 (Department of Finance, 2025a). It presents scenarios covering future challenges and opportunities under the areas of Climate Change and the Green Transition, Demographic Trends, Housing, Healthcare, Digitalisation, Deglobalisation and Future EU Expansion. The central scenario, projects a period of economic growth with Gross National Income (hereafter GNI) reaching €537bn in 2065. Annual economic growth, however, is projected to decelerate throughout, converging toward 0.5% by the mid-2060s. In the period 2025-2037 the deficit is projected to remain below 3% of GNI, economic growth remains above 1%, and debt remains <50% of GNI. The fiscal conditions begin to deteriorate during this period due to the slowdown in expected tax receipts. They map a central scenario for the following time periods:

- **2038-2054**: Public finances deteriorate, as the deficit moves towards 5%, (even with returns from the Future Ireland Fund), economic growth declines to <1 per cent, and National Debt breaches 100% of GNI.
- **2055-2065**: Without fiscal remedies or a changing economic environment, the long-term impact of these conditions begins to magnify, as the deficit reaches 7.9% of GNI, economic growth falls towards 0.5% per-annum, and National Debt reaches 148% of GNI.

Ireland is a small, open economy exposed to global risks, including geopolitical fragmentation, shifts in trade and investment patterns, climate action failures, and developments at EU level. Global protectionism, market distortions, or sudden trade disruptions can undermine high-value, high-productivity sectors such as pharmaceuticals and digital technologies. *Enterprise 2035,* which will be published in 2026 takes account of four big trends likely to transform Ireland's economy over the next decade – these are: Demographics, Decarbonisation, Digitalisation, and Deglobalisation.

The National Economic and Social Council has identified the need to increase participation and productivity across the life course, which is dependent on having access to

secure, flexible, and rewarding employment (National Economic and Social Council, 2024). They point to meaningful work and progression pathways to sustain engagement at all ages so that lifelong learning will become a central feature of the system, equipping people to adapt as technologies and industries evolve. In this context, employers, educators, and government each have roles to play in promoting continuous skill development and inclusive workplaces (National Economic and Social Council, 2024). The *National Skills Strategy 2025* and the *National Strategy for Higher Education to 2030* are referenced as providing support for a lifelong learning approach but the NESC suggests that these strategies may need to be revisited in the light of demographic and technological changes (National Economic and Social Council, 2024).

Future Forty views technologies such as artificial intelligence (AI) and quantum computing as having the potential to raise productivity across a wide range of sectors where the process of digitalisation will impact on every part of the economy (Department of Finance, 2025b). In the period 1998-2024 employment in Ireland's ICT sector increased from 61,000 in 1998 to over 187,000 by 2024.

As part of the central scenario forecast digital investment is projected to continue to trend over the coming decades. The rate of growth is adjusted 15% upwards in the positive scenario and 15% downwards in the negative. The relationship between digital capital investment and productivity, are modelled based on ECB research. The effective adoption of digital technologies depends on key supporting factors, including digital skill levels, ICT infrastructure, and opportunities for digitalised businesses.

Future Forty views Research and Development (hereafter R&D) in addition to driving innovation, as central to the creation of the enterprise and skills base. To meet future demands and to ensure that Ireland's population is well-prepared for future technological shifts, there is a planned expansion of capacity in higher education as well as increases in postgraduate and post-doctoral provision through increasing the number of researchers per 1,000 people from <10 to 15 by 2030.

5. Research and Higher Education

Scientific research is a marker of status in universities worldwide, especially in rankings and publications. Most research and scholarship for local or national use, work in the social sciences and humanities due to their contextualised character are not regarded as highly in metrics and rankings (Marginson, 2026). For Marginsion (2026) science is global, local, and national simultaneously. Scientific publications produced in OECD countries increased by one-quarter between 2011 and 2021, before falling slightly in 2022 and 2023. In the same period, the number of publications in China and India increased by, respectively, 175% and 190%, meaning China now produces twice as many scientific publications each year as the United States (Marginson, 2026).

Efforts to refocus academic research away from a culture of quantity towards more sustainable models centred on innovation and quality are underway in a number of OECD countries. The publication of *The San Francisco Declaration on Research Assessment (DORA)* (2013) has been impactful in this area (Declaration on Research Assessment, 2013). Some OECD higher education systems have changed the way they fund academic research to promote an emphasis on quality. However, where research metrics are linked to citations and global rankings impacting on student choice and public policy, the pressure to deliver research outputs remains a constant (Jakab, Kittl, & Kiesslich, 2024).

National science policy is shaped according to nation-state objectives of security, prosperity, and global competitiveness (Marginson, 2026). The 2024 Draghi Report on European competitiveness points to under investment in R&D as a constraint on economic resilience and innovation capacity (European Commission, 2025). Governments and public research agencies are essential to research. They provide the infrastructure of universities and government laboratories that house nearly all basic science. They part fund those institutions and largely fund their research projects while also providing a stable policy, legal, and regulatory framework (Marginson, 2026). The higher education sector accounts for most non-commercial research activity and provides the training context for the majority of doctoral candidates and researchers. In 2023, 16% of total Gross Domestic Expenditure on Research and Development (GERD) in OECD countries took place in the higher education sector, while 74% took place in the business sector (OECD, 2025b). In the OECD, the lowest

reported shares of expenditure on research for the year 2022 are observed in Ireland (14%), the United States (13%), Chile (6%) and Bulgaria (5%) (Figure 1) (OECD, 2025d). Higher education research tends to attract revenue that does not cover its full economic costs, thereby reducing research activity and increasing cross-subsidies from other revenue streams. Without action to either reduce the costs of research or increase the revenues to support it, this situation is not financially sustainable in the long term (OECD, 2025d). Establishing the reasonable cost for activities and outputs, including research, in higher education settings can be challenging because of the difficulty of establishing objective quality benchmarks at which these activities and outputs should be delivered.

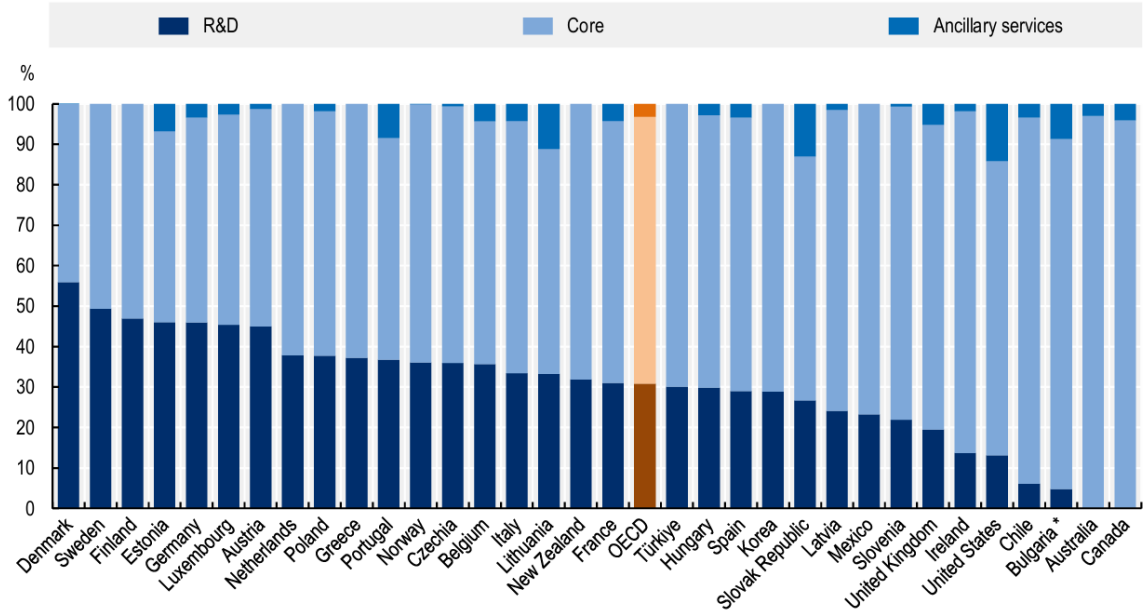

Figure 1 - Estimates of expenditure allocated to research vary substantially across countries (reproduced from: OECD, 2025d). Current expenditure of public and government-dependent private tertiary education institutions by "type" of expenditure, percentage, 2022.

5.1. The Place of Research in the Irish Higher Education Context

Ireland's research system has shared priorities with the European Research Area (ERA), which include research assessment reform, open science, gender equality, and research security. Ireland actively participates in shaping these agendas, ensuring that the research system remains aligned with European values. A central pillar of this engagement is

Ireland's participation in Horizon Europe, which is the EU's flagship funding programme for research and innovation.

Horizon Europe provides critical opportunities for Irish researchers and institutions to engage in world-class collaborations, tackle global challenges, and strengthen Ireland's position in the international research landscape. To date, Irish organisations have secured over €993m million in *Horizon Europe* funding (as of July 2025), with publicly funded higher education institutions accounting for a significant share of this success. Continued strong performance in Horizon Europe relies on sustained institutional capacity, high-quality infrastructure, and the ability to form and lead international research partnerships, all areas where the HEA's investments play a foundational role.

Irish scientific research outputs match the EU average, eighth in published papers per capita in 2018. Ireland is a leader in a small but growing number of fields, and related innovation is translating into economic benefit. The arts and humanities and the creative industries have boosted Ireland abroad, while also contributing significantly to the economy (Royal Irish Academy, 2021). The HEA 2018-2022 Strategic Plan indicated that research activity should no longer be considered under the purview of solely economic concerns and that a better balance was required between basic and applied research and societal needs (Higher Education Authority, 2018a).

The research and innovation landscape in Ireland is currently undergoing a period of significant transformation. The *Research and Innovation Act* 2024 established Taighde Éireann – Research Ireland and a new statutory framework for research governance. Taighde Éireann – Research Ireland's Strategy 2026-30 is structured around three interconnected impact themes: Talent, Economy, and Society, the interconnection of these themes focusing on excellent research and innovation across the breadth of disciplines is viewed as critical to ensuring future economic competitiveness, securing higher productivity, addressing global challenges, and supporting Ireland's future prosperity and generations. This coincides with the implementation of *Impact 2030*: *Ireland's Research and Innovation Strategy*, which sets out the Government's vision for a globally competitive, inclusive, and high-performing research system.

Significant structural challenges exist in the context of developing a high-performing research ecosystem. The absence of full economic costing of research is a significant barrier (Royal Irish Academy, 2021). National investment in research and development lags behind

EU and OECD benchmarks. In 2021, Ireland's gross domestic expenditure on R&D (GERD) stood at approximately 1.1% of GDP, compared to an OECD average of 2.7% and an EU average of 2.2%. While Ireland experienced a temporary surge in R&D investment in 2022, this was followed by a 2.4% decline in 2023 underlining the challenges in implementing sustained structural investment (Higher Education Authority, 2025). To address this, gross (public and private) expenditure on R&D is targeted at 2.5% of GNI by 2030 (OECD, 2025). On average the state provides 60% of research funding. Research expenditure is concentrated in urban HEIs (e.g., UCD, UCC, and TCD), where research spending is two to six times higher than in semi-periphery or periphery institutions (e.g., UL, MU, SETU, ATU) (Ó Maonaigh, Reilly, & Stephens, 2025).

Industry-derived funding has accounted for about 7.54% of total research expenditure in traditional universities and 4.62% for TUs (Knowledge Transfer Ireland, 2023). The most common industry partners for HEIs are overseas multinational corporations (MNCs) and Irish small and medium enterprises (SMEs) (Ó Maonaigh, Reilly, & Stephens, 2025). Accessing data about private sector supported research funding is challenging. Some HEIs disclose in annual reports, some contributions are part of broader endowments which may also cover scholarships, equipment, infrastructure or staffing. Many HEIs have established new professorships funded by industry including Meta and Eli Lilly who have sponsored faculty positions within Irish universities (Ó Maonaigh, Reilly, & Stephens, 2025). The Minister for Further and Higher Education, Research, Innovation and Science announced a €4.55 billion investment package secured for the D/FHERIS under the revised NDP 2026-2030 to support a new national research programme, a successor to the PRTLI. This funding will support a new national research programme (Department of Further and Higher Education, Research, Innovation and Science, 2025). In addition, in recognition of the need for investment in research infrastructure, the Minister launched *INSPIRE*, a €750 million investment package to transform research infrastructure across the higher education sector from 2026 to 2031, with an initial €100 million invested in 2026 (Department of Further and Higher Education, Research, Innovation and Science, 2025).

The Royal Irish Academy has recommended greater citizen engagement and participation in research activities and that research funding should be based on a distributed excellence model promoting the formation of unique regional clusters between HEIs, industry, the arts and tourism sectors (Royal Irish Academy, 2021). It also

recommended that Ireland needs to be more ambitious in attracting and retaining new talent by providing competitive doctoral and postdoctoral funding and training opportunities across all disciplines (Royal Irish Academy, 2021).

6. Future Population Trends and Higher Education

Planning for any future development in higher education requires an evidential base, and population trends are an important component of this process. The United Nations estimates that the world's population will rise to 9.8bn by 2054 and 10.2bn by 2100 (United Nations, 2024). More than half of global population growth between now and 2050 is expected to occur in just nine countries (India, United States, Indonesia, Pakistan, Nigeria, Ethiopia, Egypt, Democratic Republic of Congo, and Tanzania). In contrast, across the European Union, the population will decline from its 2026 peak due to the decreasing birth rate, even though net migration is expected to remain steady (OECD, 2025c). Population projections for the next 15 years indicate a mixed picture across countries. The age cohort aged 20-24 years is projected to decline by 5% across all 38 OECD member countries combined. The working-age population (those aged from 20 to 64 years) is projected to decline in a majority of OECD countries in the period up to 2060, falling by a combined total of 8% across OECD countries between 2023 and 2060 (OECD, 2025d).

In 2025, the tertiary education rates among 25–34-year-olds exceeded 50% in a third of OECD countries and exceeded 40% in another third, indicating that the scope to increase domestic enrolment is lower than previously (OECD, 2025d). Global higher education enrolment has more than doubled since 2000, reaching 264 million enrolments in 2023 (with women now outnumbering men). The Gross Enrolment Ratio (GER) (tertiary enrolment as a percentage of the population in the five-year age group immediately following upper secondary education) is 43%, compared to 19% in 2000 and 30% in 2010. The shrinking youth cohort in many OECD countries is already reducing the flow of new undergraduates and the public subsidy and tuition fees they bring – a pattern that will accelerate in the years to come (OECD, 2025d). In higher education systems where, international students account for a substantial proportion of enrolment, changing patterns of international mobility, geopolitical tensions and shifts in domestic immigration policies are combining to reduce inbound mobility and the income generated from international fees (OECD, 2025d).

6.1. Population Trends and Higher Education: The Irish Context

Future Forty: Ireland's Demographic Outlook Trends and Scenarios for the Next Forty Years, (developed as part of the wider Department of Finance *Future Forty* work programme) explores how population change may unfold under varying assumptions about migration, fertility, and mortality (Department of Finance, 2025b). The document points to significant data gaps, particularly on migrant outflows and return migration and models its predictions based on Australian assumptions, whose applicability to Ireland remains uncertain. Considering the data gaps, the Department of Finance recommends the creation of an integrated cross-departmental migration data system, linking visa, employment permit, Revenue and Social Protection records to enable real-time analysis and evidence-based policymaking.

As of April 2025, the resident population in Ireland was 5,458,600 million, an increase of 78,300 over the previous 12 months. Over the last decade, the number of births registered fell from 67,462 in 2014 to 54,062 in 2024, with a corresponding decline in Total Period Fertility Rates (TPFR) from 1.9 in 2014 to 1.5 in 2024. The average fertility rate in 1984 was 2.6 births. Numbers indicate a potentially major reduction in the role of births in increasing the population, which will have implications for future education system planning. The CSO population projections (Figure 2) taking into account migration indicates that by 2057 the population will be at 7.01 million (high migration – M1), 6.45 million (medium migration – M2), 5.73 million (low migration – M3). The Labour Force is projected to increase under all three potential population growth scenarios. Under high migration, the Labour Force is projected to increase by 610,000 (22.6%) by 2037 to 3,307,000 persons. Under medium migration, the Labour Force is projected to increase by 485,000 (18.0%) to 3,182,100 persons. Under low migration, the Labour Force is projected to increase by 337,200 (12.5%) persons.

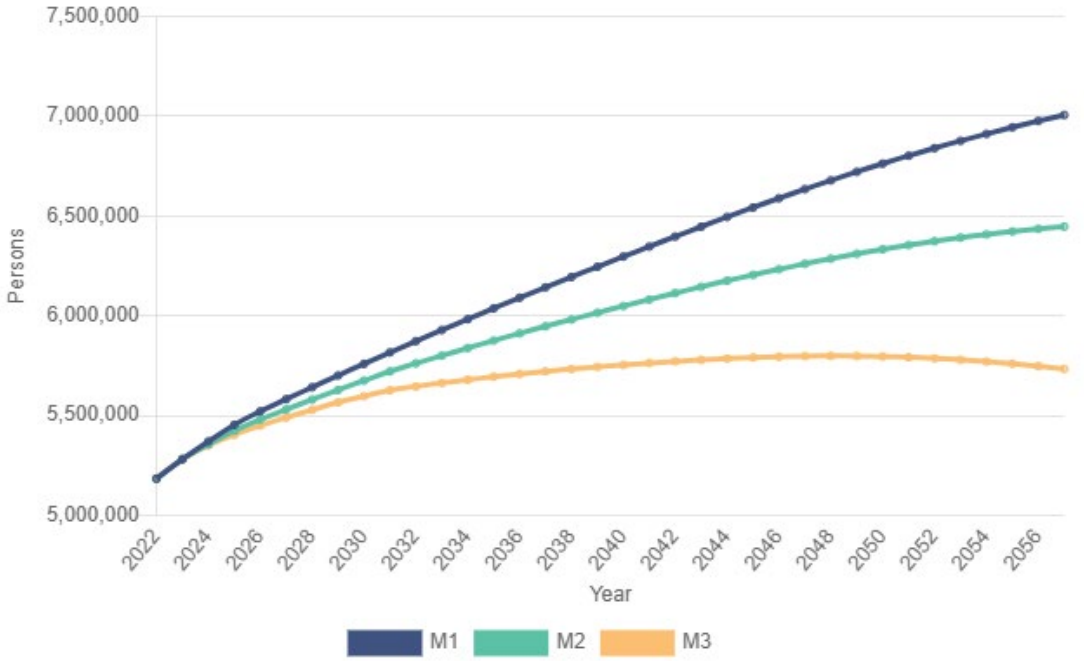

Figure 2 - Projected population, 2022 - 2057 (reproduced from: CSO, 2024)

The proportion of the population living in Dublin (1,568,000) has risen from 28.2% of the total in 2019 to 28.7% of the total in 2025. At regional level the CSO points to a number of different patterns with reference to population projections. Between 2023 and 2042, the Mid-East (Kildare, Louth, Meath, and Wicklow) sees the largest regional growth, increasing from 14.9% to between 15.5% and 16.1%. Declines are projected under CSO scenarios for the South-West (Cork City and County and Kerry), Mid-West (Clare, Limerick and Tipperary), and Border (Cavan, Donegal, Leitrim, Monaghan and Sligo) regions.

The CSO dependency ratios reveal a number of projected patterns. The young dependency ratio (the population aged 0 - 14 years expressed as a percentage of the population aged 15 - 64 years) is projected to fall under all assumptions by 2057. This ratio was 29.9% in 2022 and falls to between 20.9% and 21.2% in 2057. The young dependency ratio is expected to be at its lowest level in the early 2040s. The older dependency ratio (the population aged 65 years and over expressed as a percentage of the population aged 15 - 64 years) was 23.1% in 2022. This is projected to increase steadily from 2022 onwards, rising by 2 - 7 percentage points every five years. By 2057 this ratio will have more than doubled since 2022 under each different scenario, reaching between 46.5% and 55.9%.

At the start of the 20th century, 3,200 students were enrolled at six universities on the island of Ireland. Since 2007/08 student enrolments have increased by 57.1% for all HEA funded universities, technological universities, institutes, and publicly funded colleges. In

2024/2025 there were 278,880 student enrolments across all modes of study representing an increase of 4.9% from 2023/2024. Most students study full-time 77.3% and participate in undergraduate honours degree programmes (59.1%) of all enrolments. Ireland saw an increase in international student numbers in tertiary education from 9.6% in 2018 to 12.4% in 2023. In the academic year 2022/2023, the number of international students in the Higher Education (HE) and Further Education (FE) sectors was 35,140 and 59,757, accounting for 14% and 32% of total enrolments respectively. Non-EU nationals make up the largest proportion of both cohorts (72% and 68%). In 2018, student participation in research stood at 8,038 full-time and 1,977 part-time research students, and half were female. While the number of full-time students had remained largely static since 2012, there was a 27% increase in the number of part-time research students over the previous five years (with 84% of part-time students 30 years of age or over (Higher Education Authority, 2018b)).

7. Future Financial Stability of Higher Education

The financial sustainability of higher education is a growing concern in OECD countries. There is limited scope for investment due to constraints on public finances and the needs of other priority policy areas (OECD, 2025d). Between 2013 and 2022, the total spending on tertiary education on average increased by 15% in OECD countries. Norway, Austria, Denmark, Finland and Belgium allocated the equivalent of over 1.3% of GDP in public funds to their higher education institutions, while Lativa, Italy, Australia, Japan, the United Kingdom, Ireland, and Luxembourg allocated less than 0.6% of GDP. Policy choices and economic growth will determine the resources allocated to tertiary education in the future. Given the potential of aging societies and the increased demand on health, social care, and pension budgets, aligned with increased spending on defence, the availability of additional resources for higher education will be challenging (OECD, 2025d).

Placing higher education on a more sustainable financial footing implies re-evaluating institutional and system-wide strategies and making choices about which objectives and activities to prioritise. For many systems, unpalatable decisions about what to stop doing and what to re-organise will be required. Public funding bodies will need to make bold decisions to preserve societally important but vulnerable activities and expenditure (OECD, 2025d).

7.1. Higher Education Expenditure in Ireland

Ireland was severely affected by the Great Recession (2008) compounded by a property crash and the collapse of Irish banks, whose debts the Government had earlier guaranteed (O'Sullivan, 2017). As a result, the Government undertook a difficult programme of austerity measures, combining tax increases and expenditure cuts. Between 2008 and 2015, total university income (including the increased student contribution) fell by 8% while student numbers rose by 14%, leading to core income per student falling by 22%. The State contribution fell by 38.4% over this period (Chapman & Doris, 2019). Individual HEIs were

encouraged to reduce their reliance on public funding and generate additional revenue to meet shortfalls (Chapman & Doris, 2019). The OECD (2024) also recommended that HEIs in Ireland should be actively incentivised to seek external sources of funding.

Between 2008 and 2019, core public funding for universities decreased by 50% (Parliamentary Budget Office, 2018). *Investing in National Ambition: A Strategy for Funding Higher Education* (the Cassells report) was published by government in March 2016 to address the funding crisis (Department of Education and Skills, 2016a). The report was stark, projecting a need for annual funding of €600 million by 2021 and €1 billion by 2030 to meet the requirements of a quality HE system and increases in the population (Chapman & Doris, 2019). In Ireland, the total expenditure on tertiary education institutions as a percentage of GDP in 2022 was 0.76, the third lowest in the OECD. In 2022, D/FHERIS reported a funding gap of €307 million annually (Ó Maonaigh, Reilly, & Stephens, 2025). Acknowledging the financial and resourcing challenges, successive governments have made commitments to address the issue in future budgets. Various aspects of HEI funding are reported in multiple public databases and in reports published by the HEA, Research Ireland, Knowledge Transfer Ireland (KTI), the EU Financial transparency system and D/FHERIS. This fragmented network of reporting also makes it challenging to assess the nature of non-public funding within HEIs in Ireland (Ó Maonaigh, Reilly, & Stephens, 2025).

The question of student fees and contribution remains a challenge. Before 1996, Irish university students paid tuition fees that were substantial relative to typical incomes at the time. In 1996, fees were about €2,000 per annum at a time when average annual industrial earnings were about €18,000 (Chapman & Doris, 2019). These costs were mitigated by a system of 'student grants' that paid the fees (and some maintenance payments) for the children of families whose income was low enough to qualify. The proportion of university students in receipt of grants has varied over the years. McCoy et al., (2009) reported it at 63% in 1992. Student fees were abolished in 1996, at which point a student contribution of €191 was payable towards non-tuition costs such as examinations. The stated aim of this reform was to improve access to higher education for students from low-income families. Denny (2014) found that the socio-economic gradient in higher education attendance was unaffected by the abolition of fees.

After the Great Recession, dramatic increases were imposed, with the contribution rising by €500 per year until it reached €3,000 in 2014. These fees were payable by half of

students, with the fees of those from low-income backgrounds waived. The increased fee income from students allowed the Government to reduce its expenditure on higher education at a time when student numbers were increasing substantially (Chapman & Doris, 2019).

Successive governments have committed to reducing the student contribution fee. In Budget 2026, a permanent €500 reduction in the student contribution fee to €2,500 became effective from Jan 1, 2026. For the 2025/2026 academic year, the SUSI income limits for maintenance grants increased by 15%, with the special rate threshold rising to €27,400. Partial fee grants are available for families with reckonable income up to €120,000, depending on dependent children and the number of people in college. Apprentices in higher education will also have their contribution reduced by up to 17%, on a pro rata basis.

Graduate emigration is a feature of the Irish higher education landscape. In 2007, at the peak of the economic boom, 30,700 Irish nationals returned to live in Ireland, and 12,900 Irish nationals emigrated. In 2025, the number of Irish return migrants was similar, at 31,500. But the number of Irish emigrants was much higher, at 35,000. Around a third of emigrants in 2025 were aged 15-24 (Central Statistics Office, 2025). In the context of Ireland's strong employment growth, the increase in emigration of Irish nationals is somewhat surprising (Creaton, Hogan, & Smyth, 2025). It might reflect the desire for younger people to travel after the pandemic and to spend time abroad, but it also reflects the rising costs of living in Ireland especially the costs of housing. The *Growing Up in Ireland* Survey (Cohort '98 (born in 1998 and first interviewed when they were nine years old in 2007/'08) in its most recent wave of data collection found that one in eight (12.7%) of the respondents contacted to take part had emigrated.

8. Policy Development in Irish Higher Education

Policy makers in Ireland are influenced by developments in global higher education. Bodies such as the OECD and the World Bank are significant influencers of national HE policies. EU policy directives including the *Bologna Declaration* (European Higher Education Area, 2026), the *Lisbon Strategy* (European Parliament, 2000) and its successor the *Europe 2020 Strategy* (European Commission, 2010), have served to incorporate EU objectives into the education systems of member states. The *Bologna Declaration* (European Higher Education Area 1999) 'was arguably one of the first significant events which would dislocate Irish HE policy from focusing on the local to the more regional, European context' (Burke, 2021).

In 2004, the OECD identified several areas for policy development in Irish higher education. These included the need to focus on the strategic steering of the tertiary education system; governance and management of higher education institutions; the strategic management of research, R&D and innovation; access and participation and investment in the tertiary sector. From the mid-1990s, the focus of policy development in the higher education sector was on Ireland and its citizens (Burke, 2021). Since then a co-regulation model of sectoral governance emerged granting the HEA greater oversight to align the strategic priorities of HEIs with national economic and social objectives. The co-regulation model supports the assessment of institutional performance, including key performance indicators (KPIs) (Ó Maonaigh, Reilly, & Stephens, 2025).

In addition to supporting the knowledge economy, the issues of access, equality, social democracy, and citizenship have also remained a central concern to policy makers. Various policy initiatives by successive governments have shaped the direction of the HE system examples include; the *National Access Plan 2022-2028*; the establishment of the National Tertiary Office and the National Apprenticeship Office; *Investing in Global Relationships: Irelands International Education Strategy* 2010-2015 (Department of Education and Skills, 2010); *National Strategy for Higher Education to 20*30 (Department of Education and Skills, 2011); *Investing in National Ambition: A Strategy for Funding Higher*

Education (Department of Education and Skills, 2016a); *Irish Educated Globally Connected: An International Education Strategy for Ireland 2016-2020* (Department of Education and Skills, 2016b). The *National Strategy for Higher Education to 2030* was framed against the backdrop of the economic recession and merits reflection in the context of the many changes that have occurred since its publication.

In the context of policy contribution, the HEA is one agency in a multi-layered landscape of different stakeholders governed by the D/FHERIS and the Minister. The *Higher Education Authority Act* (2022) underpins the activities of the HEA and is currently establishing the role of the HEA in different aspects higher education landscape. As the system matures under this legislation, different elements of the Act will inform future developments and approaches. Given that context, there are certain limitations around the role that the HEA can play in light of future global megatrends and projected developments in Ireland. Nevertheless, the HEA Board has a responsibility to consider future strategic directions for the agency as a very important stakeholder in Irish higher education policy development.

9. Discussion

Thus far this paper has outlined the complex range of issues which inform strategy development and policy formation in Irish higher education. This discussion section provides an analysis of selected themes raised in the paper.

9.1 Mega Trends & Geopolitics

Irish higher education is increasingly shaped by global forces that extend beyond national control. The acceleration of AI and digital technologies is transforming knowledge creation, teaching methods, and labour markets simultaneously, while climate imperatives are repositioning universities as both contributors to and responders to sustainability transitions.

At the same time, geopolitical uncertainty (particularly post-Brexit realignments, EU policy evolution, shifting global student mobility and the disruptive impact of international events) creates both risks and opportunities for Ireland's positioning as an English-speaking gateway to Europe. A key strategic tension is how Ireland can maintain openness to global talent and collaboration while managing dependence on volatile international student markets.

At a national level Ireland's projected fiscal trajectory, as outlined in *Future Forty*, suggests that the current period of economic growth may not be sustained indefinitely, with public finances expected to come under increasing strain from the late 2030s. This raises questions about intergenerational sustainability, where over-reliance on cyclical public funding could expose institutions to austerity-style corrections. It heightens the importance of building resilient funding models and adaptive governance structures that can absorb fiscal shocks without undermining quality or access. The challenge for the higher education sector will be to balance short-term expansion with long-term sustainability.

9.2 Future Scenarios in Higher Education

The next decade is likely to bring structural transformation in how higher education is delivered and organised. Traditional degree models may coexist with modular, flexible, and lifelong learning pathways, potentially disrupting the coherence of current systems. Institutions may face choices between competing identities: campus-based vs digital-first, teaching-led vs research-intensive, regionally anchored vs globally competitive.

The rise of AI-driven learning tools and alternative providers may challenge the monopoly of traditional universities, while system-level decisions around consolidation, collaboration, or differentiation will shape institutional sustainability. Scenario planning is therefore essential to anticipate divergent futures, including high-demand growth, financial constraint or technological disruption.

9.3 Industry, Work Patterns & Higher Education

The relationship between higher education and the labour market is becoming more dynamic and less predictable. Rapid technological change is shortening skill lifecycles, requiring continuous learning, upskilling, and reskilling; and employers increasingly prioritise adaptability, digital literacy and transversal competencies such as critical and innovative thinking, inter- and intra-personal skills, global citizenship and media/information literacy. Work patterns (e.g. remote, hybrid and portfolio careers) are changing not only what graduates need to know but how and when they learn.

This shifts higher education from a “front-loaded” or linear transition model to a lifelong learning system integrated with employers and industry. A key challenge for Ireland will be aligning institutional incentives, curricula, and funding structures with an economy that demands agility and responsiveness, while avoiding overly narrow vocationalism. Alongside this is the challenge of equipping learners with the ethical reasoning and critical thinking skills required to navigate future complexities and the development of a self-regulation mindset of learning/unlearning/relearning.

There is a growing question as to whether higher education should place more explicit emphasis on developing students' adaptive capacities, supporting them to understand how they learn, and to cultivate the critical, analytical, and problem-solving skills required to navigate complexity and continual change. There is evidence that the ability to 'learn how to learn' (through metacognition and self-regulated learning) is central to student success, critical thinking, and lifelong learning. Despite the growing evidence that metacognitive capabilities are central to effective learning, these do not develop automatically, and many students require explicit support to develop these skills (Stanton et al, 2021). While many higher education institutions incorporate aspects of this through active learning pedagogies and targeted interventions, the development of these capabilities remains uneven and often implicit, rather than systematically embedded across curricula. A persistent gap remains between the research evidence supporting these approaches and their consistent implementation in practise.

9.4 Research & Innovation and Higher Education

Ireland's research ecosystem is both a national asset and a strategic vulnerability due to its reliance on external funding streams and international collaboration networks. The future research landscape will likely place greater emphasis on mission-driven, interdisciplinary work addressing societal challenges such as climate change, health, and digital transformation. At the same time, expectations around impact, commercialisation, and regional engagement are increasing.

A central tension lies in balancing research excellence with broader societal and economic contributions, particularly in a system with diverse institutional missions. Ensuring sustainable research careers and infrastructure investment will also be critical as global competition for talent intensifies.

Recent policy and investment developments, particularly the establishment of Research Ireland, the *Research and Innovation Act* 2024 and significant investment commitments for research programmes and infrastructure (e.g. *INSPIRE*), signal a transition toward a more coordinated, mission-driven and impact-oriented research system. The Research Ireland strategic emphasis on Talent, Economy and Society reflects a broadening of

expectations: higher education institutions are not only drivers of economic competitiveness but also stewards of research integrity, public trust and societal engagement.

This places increasing responsibilities on institutions to embed research ethics, open science practices, and meaningful citizen participation within their research ecosystems. At the same time the scale of ambition in attracting and retaining global talent will require Ireland to address structural issues such as career precarity, doctoral funding competitiveness, and long-term research career pathways. The interaction between increased investment and higher expectations raises a critical question about institutional capacity to deliver sustained, high quality and socially embedded research at scale.

9.5 Future Population Trends in Ireland & Higher Education

Demographic change will significantly influence demand for higher education over the next decade. Ireland is currently experiencing the delayed impact of higher birth rates in the mid-2000s and early 2010s, resulting in continuing growth in post-primary enrolments and school leaver numbers in the short term.

However, demographic projections indicate that this trend is likely to peak in the mid-2020s and decline thereafter, as lower birth rates in more recent years feed through the education system. This suggests that higher education demand may shift from a period of expansion to one of stabilisation or contraction, albeit mediated by migration patterns and participation trends. Sustained inward migration and increasing participation among mature, part-time and lifelong learners may partially mitigate declining school leaver numbers, while reinforcing a structural shift towards a more diverse and lifelong learning-oriented higher education system.

International students will remain an important component, though their composition and expectations may evolve. These trends raise questions about whether the current system is designed for a more heterogeneous student body and whether sufficient flexibility, support, and pathways exist.

9.6 Future Financial Stability in Ireland & Higher Education

The financial sustainability of Irish higher education remains one of its most pressing strategic challenges. The current funding model, characterised by a mix of public funding and student contributions, and funding from non-public sources, faces ongoing pressure from rising costs, political constraints, and growing demand. Heavy reliance on international student fees introduces volatility and exposure to external shocks. The sector is still recovering from the decreases in core public funding of the Great Recession era.

Institutions must explore diversified revenue streams while managing cost pressures related to staffing, infrastructure, and compliance. At system level, the question remains whether incremental reform is sufficient or whether more fundamental restructuring of funding mechanisms is required.

9.7 Policy Development in Irish Higher Education

Policy development in Irish higher education is increasingly influenced not only by national priorities but also by global policy frameworks and comparative benchmarking, particularly through organisations such as the OECD and the European Union. These bodies shape expectations around system performance, skills alignment, funding models and accountability, often reinforcing a shift toward outcome-based and impact-oriented policy.

At the same time the role of the HEA is evolving towards a more active system of stewardship and oversight function, with greater emphasis on aligning institutional strategies with national economic, social and regional development objectives. This creates a more coordinated but also a more directive policy environment, in which institutional autonomy must be balanced against system coherence and national strategic goals. Regulatory demands are expanding in areas such as quality assurance, data governance, and academic integrity in the age of AI.

However, alongside the imperative to support a competitive knowledge economy, Irish higher education policy has long been underpinned by commitments to access, social mobility, and the broader civic mission of universities as institutions of democratic life. These priorities remain central, particularly in addressing educational disadvantage, widening participation, and fostering critical, engaged citizenship. The challenge for policymakers is not simply one of alignment and performance, but of maintaining a balance between instrumental economic goals and the intrinsic public value of higher education.

A key challenge will be ensuring that this alignment does not constrain institutional diversity, innovation or responsiveness to local and disciplinary needs, particularly in a context of growing complexity and external pressures. The complexity of the policy environment is one where questions of equity, societal impact and institutional autonomy intersect with global pressures for efficiency and measurable outcomes.

10. Conclusion

This background paper has highlighted how Irish higher education is entering a period of significant and overlapping transition, characterised less by linear growth and more by increasing uncertainty and structural change. Demographic trends suggest a near-term continuation of growth in school-leaver demand, followed by stabilisation or decline, while fiscal projections point to emerging constraints on public funding over the longer term.

At the same time, technological change, shifting labour market demands and evolving patterns of participation are altering both the nature of learning and the composition of the student population. Taken together, these developments suggest that the central challenge facing the sector is not simply one of expansion, but of ensuring resilience and adaptability in a more complex and less predictable environment.

A key insight arising from this analysis is that many of the pressures facing the system cut across traditional domains of policy and institutional activity. Issues of funding, demography, research, teaching and learning, and governance are increasingly interdependent, meaning that interventions in one area will have consequences in others. This highlights the limits of incremental or siloed reform and points instead to the need for more coherent, system-level approaches to planning and policy development. The emphasis, therefore, shifts from addressing discrete challenges to designing a system that can respond effectively to a set of interconnected transformations.

At the same time, the nature and purposes of higher education are evolving. The traditional model, largely oriented towards full-time school-leavers, is being reshaped by the growth of lifelong learning, more varied participation pathways, a stronger emphasis on the student experience, and closer interaction with employers and wider society. This transition requires not only structural adjustments in provision but also a rethinking of educational priorities. There is growing recognition that higher education must place more explicit emphasis on developing students' adaptive capabilities, placing the student learning experience at the centre of system design, and enabling them to understand how they learn, to think critically, and respond effectively to complex and changing contexts. This represents

a shift from knowledge transmission alone towards the cultivation of capabilities that support learning across the life course.

These developments are unfolding within a policy environment that is becoming more complex and more directive. Global influences, including OECD frameworks and European policy agendas, are shaping expectations around performance, skills and accountability. At the same time the HEA is evolving towards a more active system stewardship role, encompassing its functions in planning, funding, regulation, and advice. Longstanding commitments to access, equality, social mobility, and the civic role of higher education remain central. The resulting policy landscape is characterised by a series of enduring tensions: between economic and societal objectives; between system coherence and institutional autonomy; and between global competitiveness and national and regional responsibilities.

Looking ahead, a central issue is whether the current configuration of the higher education system is fit for purpose in this evolving context. This is not solely a question of capacity, but of capability – the ability of institutions and the wider system to operate with sufficient flexibility and responsiveness to manage demographic fluctuation, technological change and shifting patterns of demand, and ensuring the system is designed around the needs and experiences of an increasingly diverse student population. It also involves confronting a set of unavoidable trade-offs, including between expansion and sustainability; excellence and inclusion; and alignment and differentiation. Addressing these trade-offs will require not only policy clarity, but also a willingness to prioritise and engage with alternative future scenarios.

Scenario-based planning, in this context, offers a useful way of framing strategic decision-making. By considering a range of plausible futures, shaped by different combinations of demographic, economic, technological, and policy developments, it becomes possible to test the robustness of current approaches and to identify options that are resilient across multiple trajectories. This shifts the focus from predicting a single future to preparing for uncertainty, and it reinforces the importance of agility at both system and institutional levels.

Ultimately the next decade represents a critical window for Irish higher education. Decisions taken in relation to funding, governance, system design, and institutional roles will have long-term consequences for the shape and sustainability of the sector. The challenge

will be to develop a system that is not only efficient and internationally competitive, but also inclusive, flexible, and capable of supporting both economic development and the broader social and civic purposes of higher education, while placing student experiences, success and lifelong learning at its core.

The issues identified in this paper closely align with the HEA's current Corporate Strategic Plan, which operates across four interconnected themes: **Develop, Fund, Regulate & Oversight,** and **Advice**. Taken together these functions provide a set of levers through which system-level challenges can be addressed: **Develop** focuses on shaping the long-term evolution of the higher education system and strengthening institutional capability; **Fund** provides a mechanism to incentivise priority areas and manage resource allocation in a constrained environment; **Regulate & Oversight** ensures accountability, performance, and alignment with national objectives; and **Advice** positions the HEA as a central source of data, analysis and strategic insight to guide policy. The effectiveness of this model, however, depends on how these levers are deployed in a coordinated and balanced way to address the complex, cross-cutting challenges outlined in this paper, particularly in relation to system coherence, institutional differentiation, lifelong learning and adaptability in the face of demographic, technological, and economic change.

In this context, the future of Irish higher education can be understood not as a continuation of existing trajectories, but as a question of deliberate system design. The converge of demographic, fiscal, technological, and societal change presents both risks and opportunities, requiring a shift from incremental adaptation to more coordinated and strategic decision-making. Central to this will be the capacity to align system-level objectives with institutional differentiation, while ensuring that funding, policy, and governance frameworks collectively support innovation, flexibility, and inclusion. Above all, the system must remain grounded in its core purpose: supporting student learning, development and success across increasingly diverse pathways throughout the life course. The challenge is to shape a higher education system that is not only coherent and sustainable, but also agile and student-centred, and capable of responding effectively to the evolving needs of society and the economy.

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