Paper 15

Science or Science Fiction? The application of scenario techniques to the study of possible futures for learners in higher education

Abstract
This study has utilised scenario techniques to explore possible futures for learners in Institute of Technology (IoT) sector of Irish higher education towards 2020. A six stage modified scenario development design was used to develop and subsequently test a series of sixty scenario statements. The results were presented at a seminar held at the site of inquiry. In order to provide a coherent interpretation of the findings a positive scenario was written. The feedback from the seminar and the work of a Delphi panel was used to guide the writing of the scenario. The scenario includes five sub-scenarios, which are: access (sustaining the widening participation agenda), curriculum (utilising delegated authority), resources (attracting funding and staff), management (competition or collaboration?) and the external environment (meeting social and economic needs). The five scenarios provide an account of five possible futures for the IoT sector. The purpose of this study was to generate discussion and inform strategic planning at the site of inquiry and across the whole IoT sector.

Introduction

'At the start of the twenty-first century, we inhabit a globe in the grip of consensus. The world's voters think their governments can and should deliver economic prosperity. The elites agree with them – and even agree with each other on how to do it. Increasingly they sign up to the same package: free trade, market economics, the virtues of entrepreneurship – education, education, education' (Wolf 2002: ix). Vincent-Lancrin (2004) explains that in many countries of the Organisation for Economic Co-operation and Development (OECD), higher education provision has already changed significantly over the past decades, but these changes will become even greater in the future, as a result of the rapid evolution of the post-secondary education landscape. It is therefore timely, possibly urgent, to consider the possible future of higher education in Ireland. A futures study helps to create a common understanding of the changes affecting Irish higher education, and helps stakeholders propose adequate responses to these changes. As the university and IoT sectors are different, experiencing different changes and almost certain to experience significantly different futures, this research is focused on one sector of Irish higher education, the IoT sector. The urge to reflect anew on the future of Irish higher education, specifically the IoT sector, is highlighted by ongoing strategic planning by the HEA and the individual IoTs. In addition there is an increasing amount of literature on this subject (Avila and Léger, 2005; Enders, 2005; Fink and Marr, 2005) as well as new policy papers on future directions for the IoT sector (OECD, 2004; Government of Ireland, 2005, 2006, 2007; HEA 2004a; 2004b; 2004c; 2006a; 2006b; 2007a; 2007b).

The higher education system in Ireland comprises the university sector, the IoTs and the colleges of education; all are substantially state funded. Since the 1960s the number of higher education students has grown from 18,200 to almost 140,000. The seven universities are autonomous and self-governing. The IoTs, in emergence since 1971, differ from the universities in that they are centrally managed by the Department of Education and Science, but since 1999 the IoTs have through *Delegated Authority* become self awarding bodies. The thirteen IoTs in Ireland are; Athlone IT, IT Blanchardstown, Carlow IT, Cork IT, Dundalk IT, Dun Laoghaire IT, Galway-Mayo IT, Letterkenny IT, Limerick IT, IT Sligo, Tallaght IT, Tralee IT and Waterford IT. There are five Colleges of Education for primary teachers which offer three year full-time courses leading to a degree which is the recognised qualification for primary teaching.

The last forty years have witnessed significant changes in occupational structure. Pre mass education power and status in Ireland were based primarily on property, but are now rooted in educational competence and waged employment (Farnham, 1999; O'Donnell et al., 2001). The ability of educators, policymakers and business to persuade students in Ireland of the value of a higher level education has significantly contributed to economic success. The starting point for recent higher education reforms in Ireland was the White Paper '*Charting the Future of Education*' (1995). The principles of this document address the role of higher education in advancing social and economic well-being; rights, equality,

pluralism, partnership, accountability and the importance of knowledge and skills for national competitiveness and development (Skilbeck, 2001). Understandably, considering the very rapid rates of growth, much interest is expressed in the change agenda, both for the sector as a whole and the IoTs. Targets have been set by government, industry bodies and higher education, which include substantial enrolment increases, innovative course design, course redevelopment, the allocation of substantial state finance to develop infrastructure, staff development, strategic visioning and efficiency gains. Central to this vision of higher education, Lueddeke (1999) outlined that there is an expectation that higher education can make a distinctive contribution to the development of a learning society, not only by nurturing notions such as life-long learning, but also by enhancing an institution's capacity to meet international standards as these relate to teaching, scholarship and research.

Methodology

In order to explore possible futures for the IoT sector in Ireland this research applies a six stage modified scenario development design. Schwartz (1996, p. 1) explains that 'no matter what future takes place, you are much more likely to be ready for it – and influential in it – if you have thought seriously about scenarios.' Scenarios as a strategy methodology were originally brought to most people's attention through Pierre Wack's (1985a; 1985b) description of Royal Dutch Shell's use of them during the 1970s and 1980s. Scenario development, testing and planning are established elements in planning and management in an educational context (Enders 2005; Vincent-Lancrin 2004). Scenario development has been successfully used to set a context for strategic planning in work with senior staff in higher education in the United Kingdom (UK) (McNay, 2005). Furthermore scenario development, testing and planning are tools which can be used to measure perceptions about alternative and possible futures (Van der Heijden 1996; Ringland 2006).

In this research a six stage modified scenario development design was used to explore possible futures for the IoT sector. In stage one an extensive review of policy, strategy and plans for the IoT sector was undertaken. This review generated in excess of 100 potential scenario statements. In stage two a Delphi panel representing a variety of staff and key stakeholders worked to generate circa 150 scenario statements. In stage three the researcher in conjunction with the Delphi panel ranked the list of scenario statements and short listed sixty of the statements under five headings: access, curriculum, resources, management and the external environment. In stage four the scenario statement questionnaire was designed and circulated in paper and electronic format to stakeholders of the sector as a whole, and to staff members at one IoT. The scenario statements were than ranked to give a perceived probability rating (PPR).

Drivers of change

The management requirements of the IoTs have expanded dramatically in recent years, mainly because of the IoTs' growth in size and the complexity of the issues now confronting higher education. In order to identify the drivers of change for the IoT sector data were collected and analysed from various sources, including policy documents, publications, the strategic plans of the thirteen IoTs, and the Websites of the HEA, Department of Education and Science, the ESRI, the Central Statistics Office (CSO), the Central Applications Office (CAO) and CDIT. Furthermore, two informal interviews were held with the head of the planning committee at my institute and an academic delegate to the HEA. The eight drivers of change identified in this study are:
1. OECD Review of Higher Education in Ireland (2004)
2. Institutes of Technology Act (2006)
3. Strategic Innovation Fund (2006)
4. Re-branding of IoT Sector (2007)
5. Higher Education Authority Action Plan (2007-2009)
6. Strategy for Science, Technology and Innovation (2006-2011)
7. National Development Plan (2007-2013)
8. Europeanisation (Lisbon Convention 1997; European Ministers of Education 1999; EU Commission 2003)

The research presented in this paper has coincided with a significant reorientation of the IoT sector. The policy initiatives will, in the opinion of the researcher, be the strongest drivers of change for the IoT sector over the period towards 2020. The final list of sixty scenario statements and subsequently the five scenarios have been framed accordingly.

Realms of change

Informed by an extensive review of the policy context, literature, and work of the Delphi panel this research has identified five realms within which research into possible futures for the IoT sector can take place. When the initial list of circa 150 scenario statements had been devised each of the Delphi panel was asked to propose a suitable number of realms within which the scenario statements could be grouped. The proposed realms were then ranked by the Delphi panel. In total eight realms were proposed. The five top ranking realms were; access, curriculum, management, resources and the external environment. The three realms that were not ranked in the top five were: research, learners and funding. However, issues that relate to these realms are included in the final list of scenario statements. As an example scenario statement 59 which states that '*Ireland will meet the EU objective set out in the Lisbon Strategy to invest 3% of GDP in Research and Development*' would sit within the research realm but in its absence was situated in the realm of the external environment in the final questionnaire. Furthermore, the scenario statements that relate to learners were situated predominately in the realms of access and curriculum. While the scenario statements associated with funding appear in the realms of management, resources and the external environment as deemed appropriate by the Delphi panel.

Findings

Based on the expectations of staff at the site of inquiry and stakeholders of the IoT sector presented, it is possible to identify several trends that are likely to characterise the IoT sector towards 2020. There is an expectation that the IoTs will evolve to include: greater competition for funding and students; more efficient management; a greater diversity of learners, more demanding learners, flexible teaching patterns and closer links to the needs of the economy and society. The findings that emerged from the use of a six stage modified scenario development design indicate scepticism about government policy and also a lack of awareness of developments in national policy and policies that relate specifically to the IoT sector. Both of these findings are in line with those of McNay (2005). The findings raise questions about national policy, the missions and management of the IoTs, teaching and learning, assessment, research and development and human resource management

When reviewing the policy context and the eight drivers of change an overarching theme was that the IoT sector was at an '*exciting juncture*' in its development. The eight drivers indicated that the IoT sector was likely to grow and develop into a more dynamic sector. There was no indication of regression or significant difficulties. Therefore, a second *qualifier* is that the scenario has been written positively. The scenario is written based on the assumption that the drivers for change will drive positive change and that the impact of the findings will also lead to positive developments in the realms of access, curriculum, resources, management and the external environment.

The scenarios

The IoT sector in Ireland has undergone substantial change. 'A great deal of re-appraisal and analysis of the education system has been undertaken during the nineties, leading to the formulation of an education policy and legislative agenda which is the most significant in the history of the state' (Murphy and Coolahan 2003, p. 1). The impacts of these changes reflect the rapid expansion of the sector and the changing role of the IoTs. The main period of substantial change occurred post 1960, predominantly since the mid 1990s. Since then the IoT sector has received a greater numbers of applicants, seen a changing complexity in its relationship with the socio-economic world, stresses on resources and an expansion in its range of functions. The IoT sector in 2020 will be very different from the sector that

exists in 2008. The key changes that are likely include increases in participation, increases in research capability, the establishment of major collaborative ventures among the IoTs and the universities, and continued fluctuations in student numbers in various disciplines, programmes and institutions. The findings of this study pose a number of challenges for the IoT sector:

1. What strategies need to be put in place to facilitate increasing numbers of international students?
2. Funding changes and the introduction of greater competition: what challenges and opportunities will this pose for the IoTs?
3. The widening participation agenda: what next?
4. The needs of the labour market: what are the implications for course development and provision?
5. International agreements and targets how can they be met? Should they? Will they?
6. If the targets within the Lisbon Strategy are not met what alternative sources of funding can be secured for research?
7. If fees for part-time courses are not removed how will the IoTs remain competitive with private and non-Irish providers?
8. What impact would/will an economic recession have on the IoT sector?

This research indicates that by 2020 the diversity of learners attending the IoTs will have increased to include greater numbers of international students, adult learners, first and second generation immigrants and students from disadvantaged backgrounds. The funding streams available to the IoTs are changing. These changes mean that by 2020 the IoTs, in addition to a block grant from government, will have to compete for funding and be expected to secure funding from industry and their alumni. These changes will be framed by a need to provide evidence that the outcome(s) of activities are aligned to national strategies. Finally, the IoTs will need to deliver greater efficiency in a post '*Celtic Tiger*' economy in which government spending will be reduced.

Scenario 1 Access: sustaining the widening participation agenda

Achieving equality of access to higher education will continue to be a strategic priority for the Irish government in 2020. The specific challenge set in 2008 for the IoT sector to lead the drive to grow participation rates from 55% to 72% by 2020 (HEA 2008b) will have been successful. This growth will result in greater diversity in the student population, specifically in terms of previous academic attainment. This will have created a challenging teaching and learning environment. The HEA (2008b) target of growth in the participation rate from 55% to 72% by 2020 will have been realised. The HEA through its National Office for Equity of Access to Higher Education will have dramatically improved the opportunities for learners from all backgrounds to participate successfully in higher education. As a result, applicants with a disability, adult/mature learners and those facing social, economic and cultural barriers will have adequate opportunities to participate in higher education predominantly within an IoT. Based on research by the EGFSN (2007) which indicated that the adult participation in higher education in Ireland is very low by international standards, the IoTs will have played a key role in upskilling 500,000 members of the workforce by one level of education over the period to 2020. The achievement of targets will be enhanced by increased opportunities and incentives for part-time higher education participation. These incentives will not include the removal of fees for part-time courses, but will incorporate time off, social welfare subsidies and/or a maintenance grant.

The number of international students studying within the IoT sector will have substantially increased by 2020. This will reflect improvements in management structures, marketing, student services and the greater range of programmes introduced under delegated authority. The IoT sector will have developed a portfolio of postgraduate programmes and will market places nationally and internationally. As a result the range of diversity in nationalities studying for postgraduate programmes will have increased. The influx of circa 400,000 immigrants into Ireland since 2000 has dramatically changed the society and economy of Ireland. Since the economic downturn of 2008 migrants who had come to Ireland to work in low skill jobs, left as the economy struggled. Migrants in possession of high skill, high wage employment remained. The short term impact on the IoT sector was small. However, in 2020 there are significant impacts as second generation migrants enter higher education.

Scenario 2 Curriculum: utilising delegated authority

Towards 2020 quality teaching and learning, at both undergraduate and postgraduate levels, will be at the centre of the mission of the IoTs. The HEA (2008b) state that programmes within the IoTs need to meet both the demands of learners and national needs. Formal review processes will be in place and the IoTs will continually review their programmes, and be subject to intensive external review. The balance between provision and skills needs will not be exact, and the medium to long-term skills needs of the economy will not always match the immediate output of the IoT sector. This is particularly characteristic of a country like Ireland (Stephens et al. 2007a).

As a result of economies of scale the IoTs have not developed centres of excellence across all disciplines. Instead the IoTs have developed strategic alliances with other IoTs and the universities. These alliances have facilitated the development of a number of small, specialised, high quality research centres. A by product of these collaborations is that students are facilitated when looking to progress from an excellent education at Masters Level to doctorate level education at a university. The IoTs will have developed a portfolio of programmes which include modules on work skills and industry placements.

Only a minority of programmes will have compulsory modules in the Irish language. These programmes will be targeted at the public service where the Irish language has been introduced as a pre-requisite for job applicants under the Official Languages Act 2003 (GoI, 2003). New and existing programmes will be delivered predominately through established teaching techniques, but eLearning will have emerged as a complementary delivery and assessment forum. Learners will be expected to spend in the region of 75% of their college week in lectures, tutorials and workshops and private study. This time will be supplemented by time spent in a virtual learning environment such as WebCT www.webct.com, and include innovations such as an improved version of podcasting. This trend will be a continuation of the development of virtual learning platforms that started circa 2000.

Delegated authority will have created greater competition among the IoTs. The diversity in programme provision, coupled with better transport provision, will have facilitated greater mobility among learners. The IoTs will have developed greater marketing capabilities with the expansion of campaigns across all media formats and outside of regional boundaries. An element of this competition for learners will include the expansion of student services and facilities. The IoTs will follow the practice of the universities and seek funding for sporting and cultural organisations to help increase scholarships and bursaries in an effort to attract learners. A number of the IoTs will prioritise sporting success as a strategy to promote their institution, while others will promote academic achievement.

The IoT sector will develop programmes to help foster diversity, both in terms of the curriculum and the levels at which awards are made. These developments will run parallel to developments that address the needs of full-time, part-time, continuing and professional education. The adoption of a modular approach to curriculum development as proposed by the EGFSN (2007) will improve the responsiveness of the IoTs to the needs of society and the economy. This transition will enabled widespread interaction on curriculum design, delivery, assessment and the attainment of relevant awards. Accreditation arrangements will be characterised by greater flexibility for joint industry/IoT employee programmes.

New access models and modular approaches to curriculum development, have facilitated those already in employment in addressing their lifelong learning needs. Such developments have been a byproduct of industrial placements, accreditation of work-based learning and the recognition of experiential learning. The success of new initiatives in these areas is based on patterns of closer interaction between IoT staff and their colleagues in industry. The result is suitable linkages to productivity, performance, quality and safety which have positioned access to the IoTs as a strategic imperative for industry. Industry is no longer viewed as a customer of the IoT but as an active partner contributing to the educational process.

Scenario 3 Resources: attracting funding and staff

The major changes which have occurred in the area of financial resources mean that there is now a system-wide, strategic, performance-based funding element for overall block grant allocation to the IoTs. The new funding instruments provide a basis for assessing both the contribution of an IoT to national targets and to sector-wide performance. The most significant change is that the proportion of funding that is received directly from the government is reduced. As a consequence there has been a transformation in the ways and the sources from which funding is received by the IoTs. The IoTs have developed links with industry through their new research activities and the increased numbers of learners participating in a placement as part of their studies. These linkages facilitate the attraction of support and funding from industry. These changes are similar to strategies which operated in the university sector in 2008. For example, Limerick IoT will have developed a successful partnership with the locally based Dell Computers Corporation. Under the PRTLI, the IoTs will have formed partnerships to facilitate collaborative projects that attract funding. In addition this need for collaboration will have increased linkages between the IoTs and the seven universities, who will predominately remain the lead partners in proposals.

The IoTs will have worked to realign their human resources with the sector's evolving research ethos. There have not been major policy concerns regarding the recruitment, selecting and assigning of academic staff during the twelve year period. There are better qualified applicants for academic places than the places available. The result is a higher level of competition for the job vacancies which become available. This is particularly the case for the very limited number of permanent academic positions advertised annually. Most job vacancies are for fixed term contracts subject to the requirements of the Employment Equality Act (GoI, 1998). A notable exception to limits on recruitments is that significant improvements have been made in the provision of various categories of support staff at the IoTs. The priority for management regarding recruitment/selection is to ensure the continuance of the high quality of entrants to the profession. The introduction of career breaks and the expansion of secondments have been of benefit to academics, and have also been of benefit to the sector and its students.

Significant progress has been made in the provision of continuing professional development support. The IoTs have expanded staff training to incorporate postgraduate qualifications in teaching practice and research practice. In addition the IoTs provide supports in the form of funding and time off to staff to encourage greater take up and subsequent completion of doctorates. Existing research staff have been encouraged to apply for funding and to engage with a research and publication strategy. This has been achieved by a reduction in the teaching load of those who engage in publishable research. These developments have been overseen by an institutional research coordinator and by research coordinators within each faculty. The coordinators are charged with attracting funding, project management and dissemination. In a drive to increase efficiency the IoTs will have minimal part-time staff in 2020, and there will be greater clarity and diversity in regard to the contractual obligations of academic staff. By sub contracting '*non-fundamental*' administrative functions, such as maintenance, security and the management of recreational facilities, the larger IoTs are more like big businesses, achieving notable reductions in total operating costs. These reductions have freed up resources to improve research infrastructure and student services.

Scenario 4 Management: competition or collaboration?

By 2020 the IoTs will have devised strategic targets aimed at achieving greater levels of accountability and efficiency. Closer working relationships will have been developed and sustained with other IoTs and the university sector. This strategy will ensure that applicants have the opportunity to access higher education from a diversity of routes. Management within the sector will have worked hard to engage with the other institutions to develop strategic partnerships which are used to secure funding. One element of this process will be that the IoTs located in the greater Dublin area will be working closely together to secure funding. Conversely, in relation to learners and staff, there will be a greater level of competition between the IoTs. Management within the individual IoTs have worked to ensure that institutions are promoted to maximise applicants, and to ensure that the correct calibre of staff are attracted to meet the challenges of a changing remit. One of the primary challenges for the HEA and management at the individual IoTs will be to ensure that competitive pressures do not undermine the potential for collaborative partnerships.

The IoTs will remain closely linked to their regions, and due to political pressures mergers will not have occurred. The mission of the IoTs will have evolved to encompass a wider range of activities explicitly linked to social, cultural and economic needs. The scale of this expansion will be subject to the individual IoTs ability to source funding from industry, alumni and their regions. However, the universities will also have developed, especially in regards to the level of research being conducted, the number of doctoral students, the number of leading academics and the development of centres of excellence. Strong policy commitments by successive Governments, coupled with institutional ambition to move towards a unitary system which aspires to the priorities, values and practices found in the university sector, has resulted in the introduction of a federal university system. In this system the IoTs are designated as National Technological Universities. The introduction of the university '*label*' has aided recruitment of students and improved the ability of the IoTs to compete for research funds on the international market. The separate mission and focus of the IoTs has been retained, ensuring a complementary provision to that of the seven universities. The change has implied a unification of roles with those of the seven universities; however, competition and market forces have ensured that the seven universities are to an extent perceived as '*premier division*' especially in areas that have been prioritised for research.

Scenario 5 the external environment: meeting social and economic needs

Successive governments have continued the process of privatisation, restructuring public spending, and encouraging competition which began with the centre-right government of 1997. Ireland's position in the global marketplace has been enhanced by reducing tariffs, promoting exports, and targeting knowledge intensive, high skill FDI. The benefits of the restoration of power sharing in Northern Ireland in 2008 has seen the emergence of greater cross-border movement of people, goods, services, capital and students. After the economic downturn of 2008 the Irish economy has stabilised. The delivery of transport 21 is all but complete, enhancing mobility and communication within the IoT sector. In 2020 computers have evolved into sophisticated personal technology units which are carried by the entire student and teaching population within the IoTs. The sector takes for granted the extensive network of telecommunication portals which facilitate virtual learning in every possible location and at any possible time. The health service has been restructured providing an improved standard of care, and the efficiency levels within the system are an at all time high. The result is additional funding for other government policy areas including higher education. The success of the Public Private Partnership model in providing a range of public services has led to its use in delivering infrastructural provision, specifically the provision of research centres and postgraduate study facilities.

The growth in the numbers of graduates required by the service sector has dropped, but the need for additional skills continues. The industrial base has moved from low cost manufacturing to innovation knowledge intensive activities, which have altered the type of graduate required from the IoT sector. Recruitment drives in science and engineering have achieved improved graduation numbers. There are also higher levels of research being conducted by the IoTs in the areas of science and engineering. The result is that linkages between industry and the IoT sector been dramatically improved. Many postgraduate programmes now operate a dual system of management, with industry advisors participating on course and examination boards with academics.

The continued process of European integration, coupled with the success of the Bologna process, has resulted in greater movement of students both into the IoT sector from abroad and from Ireland to other European higher education systems. Although the commitments under the Lisbon Strategy were not completely achieved, the influence of international agreements is evident particularly in the funding targets of the sector. The strategic planning guidelines introduced by the HEA have resulted in greater accountability within the sector. The IoTs have developed sophisticated operational plans which include measurable outputs. The outputs are checked annually against national priorities and the needs of society and the economy.

Conclusion

The scenarios presented in this paper provide an account of the probable/possible course of change that will occur between now and 2020 in the IoT sector. The changes presented may not happen. This may be because of an external shock, the action/inaction of staff, stakeholders or students, a shift in government thinking either in Ireland or at a European level. However, the aim of this study is to stimulate conversation and aid the development of appropriate strategic responses. Therefore, the dissemination of the results from the questionnaire and the five scenarios has focused on improving the understanding of the drivers of change, people's expectations of what changes will occur and facilitating discussion about the course of change towards 2020.

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