

Increasing flexible provision in adult education by harnessing the potential of educational technology

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Abstract

The Higher Education sector in Ireland is expanding, and is expected to have grown by 40% between 2009 and 2029. Student demographics are also changing, with an increased level of lifelong learners; who require flexibility in education while developing and updating their skills. In addition to the challenges presented by these changes, the sector is facing increasing resourcing pressures.

In this paper it is suggested that harnessing educational technologies to deliver flexible lifelong learning programmes is key to preparing the Irish Higher Education sector for the challenges of the future.

The proposed research aims to develop a framework to guide and support practitioners in implementing educational technologies, in a pedagogically effective manner; ensuring that learners develop digital skills in addition to developing work skills. This paper outlines the proposed conceptual framework and methodology for this research.

1. Introduction

In this paper it is suggested that identifying how to harness educational technologies to deliver flexibility in lifelong learning programmes is key to preparing the Higher Education sector for the challenges of the future. Furthermore it is proposed that a framework to guide and support practitioners in navigating these waters in a pedagogically effective manner is needed if successful implementation is to be achieved.

2. Context: Higher Education in Ireland

The Higher Education Sector in Ireland is currently undergoing considerable change. Changing needs and demands from stakeholders into the future have put more pressure on the sector than it has previously experienced. Stakeholders include the European Union, the state, regulators, industry, institutions, practitioners and learners. In addition to the challenges presented by the demands of these stakeholders there are ever increasing resourcing pressures upon institutions.

A shift in work patterns and types is occurring throughout the economy. The number and diversity of students entering Higher Education is constantly evolving. The challenge to Irish Higher Education sector is in preparing to meet the evolving demands placed upon it against this back drop of change.

2.1 Skills needs in an ever changing world

Growth in high-skill occupations will drive job creation in Europe and the United States of America over the next decade; and will counteract an ongoing reduction in lower-skills occupations OECD (2016). Changing work types and working patterns mean that workers will require high-skill levels to perform their functions initially and have a greater need to keep skills up to date (National Forum, 2015; OECD, 2016). Consequently higher proportions of the workforce will need to avail of opportunities in education and in training than previously needed to do so.

The skill levels of workers impact upon economic growth; and skill distributions across populations correlate strongly with income distributions (Nica & Popescu,

2014). A high rate of change in skills requirements in an economy can cause skills shortages and cause the development of mismatches between the skills of workers and the skills required by employers. Skills mismatches cost employers and employees in many ways; including productivity, potential remuneration, recruitment cycle times, job satisfaction and the job stability (OECD, 2016). The effects of mismatching can already be seen in Europe, where despite an unemployment rate of almost 11% in 2013, 40% of employers reported having difficulties in recruiting employees with the right skills (2016, p. 14). In addition to the earlier mentioned increase in need for general education and upskilling, an increasing need for reskilling will place demands on the Higher Education system,

Forty percent of workers report that their current skills levels do not “correspond” with those required by their current position, and only 30% of workers indicate that they could cope with more demanding roles (OECD, 2016, p. 12). 60% of workers in Ireland report that they are mismatched in skills, specific qualification, field of study, or literacy level (OECD, 2016, p. 21). It would appear that in addition to function specific skills, the workforce will need to have well developed digital skills to meet the challenges of the future.

From 2015 onwards, nine in ten jobs in Europe will require a level of digital skills (All Aboard, 2015; European Commission, 2014a). Individuals need to be prepared for what the National Forum (2015) calls the increasingly “digital world” in which we live. Unfortunately, over 40% of Europeans do not possess the necessary basic digital skills (European Commission, 2014a).

Individuals with Higher Educational levels “generally have better health, are more socially engaged, have higher employment rates and have higher relative earnings” (OECD, 2015, p. 30). In addition to these benefits there is a high level of correlation between educational achievement and digital skills development (OECD, 2015).

Table 1, aggregated from data presented by OECD (2015), shows the maximum educational attainment level of individuals, aged between 25 and 64, in Ireland 2014 compared with the OECD and EU21 averages. It also shows the proportion of individuals within each of these educational attainment group who were found to

have “good skills and readiness” to use Information and Communications Technologies, ICT, for problem solving.

	Year	Primary Level or Lesser	Lower Secondary or Lesser	Upper Secondary or Equivalent	Tertiary Education
A	Ireland	8%	13%	38%	41%
	OECD AVG	9%	15%	44%	33%
	EU21 AVG	7%	14%	46%	32%
B	Ireland	1%	1%	18%	45%
	OECD AVG	7%	7%	25%	52%

A: Shows the Highest Educational Level of the population aged 24-64, by percentage, in 2014

B: Shows the percentage of the population of each of these educational attainment groups found to have “good” skills and readiness to use ICT for problem solving, in 2012

Table 1- Correlation between Educational Attainment and Digital Skills

Forty five percent of individuals in Ireland, aged between 25 and 64, with tertiary education have “good skills and readiness” levels. This figure drops to 18% for individuals with upper secondary or equivalent educational achievement levels, and to only 1% for those who completed lower secondary level or below (OECD, 2015). When aggregated with the data on the percentages of the overall population in each bracket, 25.5% of 25 to 64 year olds in Ireland, have “good skills and readiness” to use ICT for problem solving. The remaining 74.5% of 25 to 64 year olds in Ireland have either basic 31%, or insufficient, 43.5%, “skills and readiness”.

Younger generations were found to have higher levels of “good skills and readiness” than older generations, reflecting the increasing average levels of education that younger generations are achieving across OECD countries (OECD, 2015, p. 35). In Ireland in 2014 the percentage of the population aged between 25 and 34 who had attained tertiary level education was 51%, compared to 41% in the wider group (2015, p. 41). This level of increase will not be sufficient to ensure that the level of ICT “skills and readiness” approaches the level of digital skills required by the wider economy.

The need for high-level work skills, upskilling and digital skills put pressure not only upon the economy but also across the Higher Education system. Meeting the skills

requirements of the population and the economy is one of the biggest challenges faced by the Higher Education sector. Postgraduate courses and shorter continuing professional development courses particularly will appeal to many individuals (National Forum, 2015). Higher proportions of the workforce are likely to engage with education and training across their careers, increasing the numbers participating in Higher Education at any given time.

2.2 Sectoral expansion

The National Strategy for Higher Education to 2030 predicts an increase in the number of students entering Higher Education in Ireland each year by 2025-2030, of 50% on 2009 figures (DES, 2011). Recent projections, where the expected policy led and demographic changes occur, reduce this proportional increase to 40% by 2029; meaning approximately 59,000 new entrants per annum (DES, 2015, p. 10).

This might at first appear to be an immense increase, but high levels of expansion have been the norm for Higher Education in Ireland and internationally. Table 2 shows the percentages of the population aged between 25 and 64, and 25 and 34, who had completed tertiary education by 2000 and by 2014, and the percentage increase which this represents.

Percentage of population completing tertiary education in 2000 and 2015, from OECD (2015)						
	Age 25-64			Age 25-34		
	2000	2014	Change	2000	2014	Change
Ireland	22	41	+86%	30	51	+70%
OECD AVG	22	34	+55%	26	37	+42%
EU21 AVG	20	32	+60%	24	39	+63%

Table 2- Percentage of each age group who have attained tertiary education

The number of new entrants entering Higher Education in Ireland doubled in the fifteen years between 1980 and 1994; before the Free Fees Initiative was introduced. The Free Fees initiative was a government led initiative introduced in 1996, which abolished full-time undergraduate tuition fees (Denny, 2014; Flannery & McGarr, 2014; Hazelkorn, 2013). A student registration fee was introduced alongside this initiative; initially at a rate approximately equivalent to €190.00 per year, but has

increased steadily since then (Hazelkorn, 2013, p. 8). This flat rate fee, relabelled as the student contribution charge, currently stands at €3,000 per year. All postgraduate students and part-time undergraduate students must pay tuition fees, which are often similar in level to the student contribution charge (Flannery & McGarr, 2014).

Table 3 shows the increases in the annual number of new entrants to Higher Education in Ireland over time; and the percentage increase over certain periods. The projected increases in are broadly in-line with EU expectations for Higher Education (European Commission, 2014b).

	Year	Annual New Entrants	References
+50%	1980	15,000	(DES, 2011)
	1989	22,521	(DES, 2009)
	1994	31,618	(DES, 2009)
+45%	1998	32,724	(O'Connell, Clancy, & McCoy, 2006)
	2004	36,051	(O'Connell et al., 2006)
+28%	2009	42,000	(DES, 2011)
	2015	42,464	(HEA, 2016)
+40%	2029	59,000 PROJECTED	(DES, 2015)

Table 3- Annual, full-time, new entrants to Irish Higher Education

The growth in the number of places available in Irish Higher Education after 1980 has been policy driven (Denny, 2014). The growth was matched by an increase in the number of traditional entrants to the system until 2003, after which the matching 'tapered off' (2014, p. 28). The projected expansion of the sector is set apart from previous periods of expansion because the demographic makeup of new entrance cohorts is changing.

2.3 Changing student demographics

Lifelong learners represented only 5% of new entrants to Higher Education in Ireland in 1998 (O'Connell et al., 2006, p. 28), but had risen to 13% by 2009 (DES, 2011). Direct entrants enter Higher Education directly after completing upper secondary education while late entrants enter Higher Education within two years of completing upper secondary education (DES, 2011). Traditional Learners are those learners

under the age of 23, who entered Higher Education as direct or late entrants. In 2009, as can be seen in figure 1, traditional learners accounted for 79% of all new full-time entrants.

In 2025, traditional learners are expected to account for only 62% of all new full-time entrants (DES, 2011). Over two thirds of this change will be accounted for by increasing levels of lifelong learners. These projected demographic changes, when paired with the most up to date projections from the Department of Education and Skills, predict that there will be some 36,580 traditional learners and 14,750 adult learners entering the Higher Education system in Ireland as full-time new entrants each year by 2029.

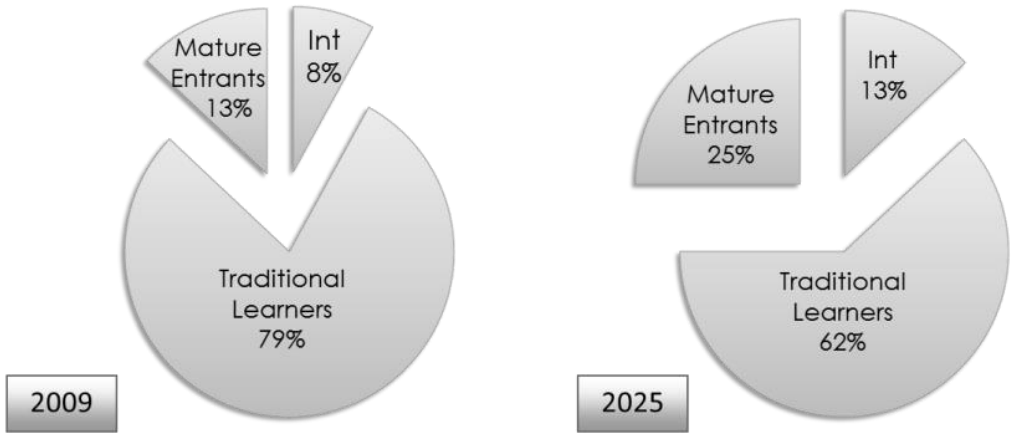


Figure 1 - Breakdown of Full-time Annual New Entrants in 2009 and projected in 2025 - adapted from DES (2011)

Ireland is not unique in seeing a proportional increase in participation by adult learners. This phenomenon can also be seen in the United Kingdom (Pollard, Newton, & Hillage, 2012). The percentage of new entrants who were over the age of 25 in 2013 varies across OECD countries, the OECD average is 18% and the EU21 average is 16% (OECD, 2015, p. 345). The countries with the lowest percentages of new entrants over the age of 25 in 2013 were Mexico at 7%, Slovenia at 8% and the United States of America at only 9%. The countries with the highest percentages of new entrants over the age of 25 in 2013 were Israel at 30%, Iceland at 32% and Switzerland at 36% (OECD, 2015, p. 345).

The educational and experiential background of lifelong learners are more diverse than those of traditional entrants (HEA, 2012; OECD, 2015). By 2029 the number of

full-time adult learners entering the Irish Higher Education system each year will match the total number of new entrants to the system in 1980. Adult learners will become too large a percentage of all learners to be considered as and treated as a subset. As such, it would appear that simply scaling up the current Higher Education system in Ireland may not offer an appropriate solution going forward. The research proposed explores ways to prepare the Higher Education sector to cope with the needs of the changing demographics.

In addition to full-time learners there are many part-time learners in the Irish Higher Education system. In 2010, full-time students represented only 79% of all enrolments (HEA, 2012). The remainder were part-time learners; with 17% of all undergraduates and 39% of all postgraduate students choosing this mode of study. The majority, 92%, of the 29,327 part-time undergraduate students and the 14,474 part-time postgraduate students were over 23 (HEA, 2012).

Over coming years, part-time enrolments are expected to increase at a faster rate than full-time enrolments in many countries, including the United States of America, Canada, Australia and Japan (Jackson, 2012). In the United Kingdom, which has seen a decrease in the number of part-time enrolments after 2008 (King, Saraswat, & Widdowson, 2015), one third of undergraduate students choose to study on a part-time basis (Butcher & Rose-Adams, 2015). Funding inequities and decreasing levels of employer contribution contributed to the reduction in number of part-time enrolments in the United Kingdom (King et al., 2015). Interestingly, in South Africa where there has also been a reduction in part-time enrolments, the reduction resulted from the inability of the sector to effectively maintain traditional provision while meeting the demand of part-time programmes (Jones & Walters, 2015).

In the scenario where the rate of part-time participation in Higher Education in Ireland neither increases nor decreases, remaining stable at 21%; then 12,390 part-time entrants should be expected by 2029. As such, adding part-time learners to the expected full-time new entrant adult learners, a total of 27,140 lifelong learners, can potentially be expected to enter the Higher Education system each year by 2029. The research proposed aims to aid practitioners and aid Higher Education institutes in responding to these changes.

Developing a future ready Higher Education sector in Ireland will mean maintaining traditional service provision while serving the diverse needs of this learner group. This task is made more complex because of different resourcing pressures that are also affecting the Higher Education sector.

2.4 Sectoral resourcing pressures

Across OECD countries there has been a reduction in the share of overall public expenditure on education which is allocated to tertiary education, falling from 69% in 2000, to 64% in 2012 (OECD, 2015, p. 28). In most cases this reduction occurred in the context of increased overall spending levels, meaning that expenditure on tertiary education actually increased despite the comparative reduction.

However, some OECD countries did experience actual reductions in spending on education post 2008 (OECD, 2015, p. 27). These countries are Hungary, Iceland, Italy, Portugal, Spain, the Russian Federation and Ireland. In the cases of Italy and the Russian Federation these decreases coincided with reduced enrolments and did not negatively impact spending per student. Higher Education funding in Ireland has decreased by 25% since 2008 (Hazelkorn, 2013). This has translated to a 20% average decrease in spending per Higher Education student since the economic crisis began in 2008 (HEA, 2014a; National Forum, 2015). The Higher Education must adapt to this reduction in funding.

In addition to direct spending on Higher Education the financial supports available to students have an impact upon participation. For example, a lack of financial support for part-time undergraduate studies discourages students from participating at this level (National Forum, 2015). This issue is not unique to Ireland, it is a problem faced by the United Kingdom too (Jackson, 2012; King et al., 2015).

19% of institutional funding is coming from privately paid student contribution charges (HEA, 2014a; National Forum, 2015). Alternative and sustainable funding models for the Higher Education sector need to be considered (DES, 2011; HEA, 2014a). Since 2010 ten OECD countries have introduced tertiary tuition fee reforms. In each case the objective was either to increase participation or to stabilise funding systems

(OECD, 2015). Public funding is now effected by retention matters and as such is not a stable source of funding (National Forum, 2015). Funding models across OECD countries vary widely (OECD, 2015), which continues to challenge HEI strategy development.

There have been reductions in staffing levels within the Irish Higher Education sector with whole-time equivalent losses of 10% of academic roles and 17% of administrative roles. An increase in research contracts occurred over the same period. Approximately 50% of all higher education institution staff are academic staff, both in Ireland, and in the UK (HEA, 2014b). This is leading to increasingly poor student to teaching personnel ratios (HEA, 2014a; National Forum, 2015). In tertiary education in Ireland the ratio is 20:1; which is 25% above the OECD and EU21 averages of 16:1 (OECD, 2015, p. 424).

2.5 The challenge of the future

There are many reasons for the expected growth within the Higher Education sector, but changing work types mean that in the first instance employees require higher skill levels to perform their functions and in the second instance there is increasing pressure to keep skills up to date.

Current and future students will be looking for high quality flexible provision that they can access anytime, anywhere. Institutions need to go beyond traditional campus-based, part-time education towards real flexibility of time, place and pace of study (National Forum, 2015, p. 17)

The changing balance between high-skill and lower-skill occupations means that participation levels in educational activities are expected to increase, both within the Higher Education system and without. All of these elements are changing the demographics of the student body. A Higher Education system that can cope with future demand is needed and must maintain current provision and focus on flexible delivery for lifelong learning and upskilling (DES, 2011; European Commission, 2015).

Adult, or non-traditional learners, often require flexibility, include those who are working and studying, or who do not have easy access to a campus, or who can

better afford, in time or finances, to complete programmes module by module or even complete programmes at an accelerated rate. Flannery and McGarr (2014) explain that flexible learning can lead to increased access to Higher Education, particularly for these learners.

Many policies in Ireland and abroad which focus on or include consideration of flexible learning do so from a part-time perspective (DES, 2011; Flannery & McGarr, 2014; HEA, 2012, 2015; Jackson, 2012; Jones & Walters, 2015; McLinden, 2013; Pollard et al., 2012). Flexible learning in Ireland is confined largely to part-time students, risking the benefits of flexible learning failing to reach to full-time learners Flannery and McGarr (2014).

System resourcing pressures, in addition to the predicted expansion and changes to the profile of learners mean that simply scaling up current practices will not necessarily meet the needs of either the Higher Education sector or the learners. Higher Education must meet the demands for increased student places and adapt programmes and pedagogies to diverse student groups (OECD, 2015). The research proposed seeks to develop a model which will contribute towards preparing the Higher Education sector to meet these challenges.

3. Technology as a Flexibility Solution

Technology can help to make learning accessible and engaging to many adult learners (European Commission, 2015). There are many reasons to use technology as a vehicle for learning in Higher Education. The National Strategy for Higher Education to 2030, which calls for a system focused upon flexible delivery and lifelong learning (DES, 2011), and “could not even be considered” without harnessing technology (National Forum, 2015, p. 19).

Many full-time students, in addition to part-time students, find it necessary to work some hours per week, or offer care to others, or are living with illnesses; to name but a few reasons why flexibility might better suit them (Jones & Walters, 2015). Similar factors were found to influence learner decisions in selecting distance learning (Butcher & Rose-Adams, 2015). Flexible learning allows learner’s choice in time and

place for study allowing opportunities for access to education as learning can fit around rather than disrupt the lives of adult learners.

Technology enabled approaches to flexible learning should be used to ensure that all learners become flexible learners (Gordon, 2014; National Forum, 2015). Technology is also central to the successful implementation of flexible learning activities. Technology is one of four key component categories of flexible learning, Institution, Implementation, Pedagogy and Technology (B. Collis & Moonen, 2001). The four categories are all dependent upon each other but technology is the central pillar and supports all other categories. In addition to increasing learner choice, technology allows the personalisation of learning resources based on learner requirements. This personalisation separates, according to Gordon (2014), flexible learning from blended learning where multiple formats or modes are offered. Technology supports both logistic and pedagogic flexibility (Flannery & McGarr, 2014; Gordon, 2014; Jones & Walters, 2015).

It is worth noting that technology is unlikely to be a successful vehicle to engage adult learners with numeracy and literacy skills below levels 3 or 4, as adults within these categories tend to have ICT skills at level 2 or below (European Commission, 2015). Less than 7% of the OECD population aged 25-64 with educational attainment at lower secondary or less, have “good skills and readiness” to use ICT in the workplace, in Ireland this average falls to only 1% (OECD, 2015). European Commission (2015), perhaps unsurprisingly, explains that a lack of basic level ICT skills would need to be addressed before the full benefit from technology enhanced learning solutions can occur.

Digital skills development is a key consideration in the use of technology in delivering flexible lifelong learning programmes in a way which will prepare the Irish Higher Education sector for the challenges of the future. As highlighted earlier, the percentage of the workforce with “good skills and readiness” to use ICT effectively in the work place, at 25.5%, is simply too low to meet the needs of the modern economy. This is not a tenable situation. Using technology to support education can help to prepare learners for the ‘increasingly digital world’ that we live in (National Forum, 2015, p. 5). In harnessing the power of technology in learning the

development of high-level workplace skills can be facilitated while digital skills are developed simultaneously.

Technology is clearly a significant enabler of flexibility in education. In addition to enabling flexibility, and supporting the National Strategy for Higher Education to 2030, using technology to deliver flexible programmes will allow lifelong learners to simultaneously build digital skills, and high-level disciplinary workplace skills.

4. Proposed Research and Methodology

The proposed methodology is focused upon developing a framework to guide the Irish Higher Education sector in designing and delivering flexible programmes for lifelong learning; using pedagogically sound, state of the art, educational technologies. As many of the challenges and opportunities facing the Irish Higher Education sector can be seen in other countries the framework will potentially have international application. The research aims to address a number of research questions as follows:

- How can pedagogically suitable educational technologies, linked to an understanding of learning theories and learning styles, be integrated into flexible, blended learning programmes improve the learning experience for lifelong learners?
- How can Higher Education providers be supported in the appropriate and most effective deployment of educational technologies to meet the needs of learners in flexible learning programmes in the Higher Education sector and bring learners and providers closer together?
- Can linking faculty training and development, learning technology and the general and financial management of distance education lead to the enhancement of sectoral performance, strategy and policy development in the delivery of lifelong learning?

- How can the Higher Education sector meet the general and continuous professional development requirements of lifelong learners within the existing structures of national policy in education, quality, and accreditation?

4.1 Preparing for sectoral expansion

The research proposed is focused upon preparing the sector to meet its evolving demands by exploiting the potential of educational technologies. This will allow the sector to maintain current services while adjusting to higher numbers of new entrants than ever before and providing services that will meet the changing needs of the student body.

Implementing technological change is unlikely to result in short term financial gain (B. Collis & Moonen, 2001, p. 124). Flannery and McGarr (2014) caution that increasing flexible learning without negative quality impacts will have time and resource costs and will require input from all stakeholders. The upfront time and costs involved in activities such as design, digitising lectures and creating materials for technology enhanced learning is a significant concern for practitioners (Gilboy, Heinerichs, & Pazzaglia, 2015; Mok, 2014; Schmidt & Ralph, 2016), although Mok explains that the upfront time can potentially be recouped in later iterations of the same course. Flexible learning may reduce teaching contact time and increase student numbers (Flannery & McGarr, 2014).

An example of a pedagogical approach which can benefit from technological enhancement is that of the Flipped Classroom model. In this approach passive learning activities such as information transmission activities and traditional lectures, occur outside of the classroom and before class. Class time is then used for active learning activities, such as group work, lab work, discussions and problem solving (Kim, Kim, Khera, & Getman, 2014; Mok, 2014; Roach, 2014; Uzunboylu & Karagozlu, 2015). The model can potentially be implemented without using technologies. However, technologies can be harnessed to create, distribute and grant access to passive activity materials; and can be harnessed in the classroom, e.g. pair programming. This type of approach increases the level of individual attention given to each student during class times, regardless of where and how classes are delivered. Increased individual attention has the potential to drive

revenues by allowing higher student to teacher ratios without quality reduction (Roach, 2014).

In terms of measuring success in implementing flexible learning, B. Collis and Moonen (2001) recommend moving away from reliance on financial accounting measures due to the myriad complications involved in accurate calculation. A simplified consideration of the level of intuitively felt value for the highest number of stakeholders, might be used to measure success (2001, p. 128). Unfortunately the funding crisis in Higher Education in Ireland, discussed earlier, means that this type of singular approach is unlikely to gain traction in the short to medium term. Consideration of both financial and intuitively felt value will be necessary if flexible learning activities are to be implemented successfully.

Increased numbers of program participants potentially can reduce the cost per student of program delivery, while increased flexibility can attract learners who would otherwise not be able to participate. Flexible study will help the sector cope with the increasing student numbers entering Higher Education, and potentially reduce the resources and costs per program, without quality reduction. Managing implementation and funding models will be the key challenges and policy areas for flexible learning over coming decades (Gordon, 2014).

4.2 Supporting policy development

An analysis of international approaches, completed by Spector (2013), reinforces the need for policy to drive change in technology adoption forward successfully. The Higher Education sector in Europe is very fragmented with regard to adoption of learning technologies and there is a need for policy in the area (European Commission, 2014b). Ireland is suffering from a lack of lifelong learning strategies seeking to implement technology enhanced learning policies and is one of the least likely countries in the European Union to successfully implement technology enhanced learning in adult education (European Commission, 2015). A major barrier in adopting technology enhanced learning practices is the lack of training and research into introducing educational technologies into flexible program provision (DES, 2011; European Commission, 2013, 2015; National Forum, 2015).

The research proposed is focused upon preparing the sector to meet its evolving demands by exploiting the potential of educational technologies to deliver flexible lifelong learning programmes; in consideration of online tools, delivery methods, pedagogy, flexibility, accreditation and validation requirements, and teaching and learning theories. The proposed research supports policy development and implementation in the sector.

4.3 Flexibility as a bridge between learner groups

Equality between student groups, full-time, part-time and remote in provision of services, access and funding is needed (HEA, 2012). Full-time students are increasingly seeking the same options as part-time students (Pollard et al., 2012), and the gap between the needs of learner groups are closing across the globe (Jones & Walters, 2015; Pollard et al., 2012).

The differences between learner categories will further reduce as more flexible options become available (Pollard et al., 2012). Eroding these differences might serve the sector better going forward, from educational, policy and equality perspectives (Maguire, 2013). Currently the Higher Education funding model in Ireland treats off campus or flexible learners “less favourably” than other student groups (Devine, 2015). Reducing categorisation would reduce inequities within the funding system.

As highlighted earlier, increasing technology enhanced flexible learning for both all learners can have the potential benefit of counteracting the negative impact of increased student to staff ratios in Ireland by allowing new pedagogical approaches.

4.4 Pedagogically supported implementation

Flexibility measures introduced by many individual practitioners are driven by pedagogical interests, but Irish policy on flexible learning does not reflect this as it fails to consider pedagogical flexibility (Flannery & McGarr, 2014, p. 429). This seems representative of a trend as Higher Education as a whole has adopted many measures of logistical flexibility but has yet to embed pedagogic flexibility (B. Collis & Moonen, 2010). Higher Education must consider adaptability and pedagogy going forward (OECD, 2015). A need for focus upon pedagogy is highlighted by Jones and

Walters (2015) who explain that new pedagogies are needed going forward to facilitate increased flexibility in learning.

The proposed research aims to develop a model for flexible lifelong learning delivery which will aid Higher Education practitioners in targeted deployment of educational technologies, as pedagogically beneficially and effectively as possible within the Irish Higher Education sector. In developing the framework a contribution to the evidence base in Ireland with regard to pedagogical approach, provider and student experiences relating to technology enhanced learning in Ireland will be made.

4.5 Methodology

A concurrent triangulation mixed methods design, using 3 discrete data collection phases, will be used in this study. A technology enhanced flexible learning framework will be developed from empirical data and existing works.

This research is situated within the philosophical paradigm of pragmatism. Pragmatism as a research philosophy recognises the similarities in logic and purpose of research designs in positivist and interpretivist paradigms and the adaptability of those designs to move between theory testing and theory generation. Pragmatism, according to Punch (2009) is essentially concerned with selecting research approaches which work to best answer specific research questions, as opposed to rejecting views, approaches or methods based on paradigm alone. In educational research pragmatism as a research paradigm is commonly associated with mixed methods research designs (Burke-Johnson & Onwuegbuzie, 2004; John W. Creswell, 2009; Punch, 2009)

Bryman (2008), John W. Creswell (2009), Punch (2009) and Wisker (2008) describe the collection of both quantitative and qualitative empirical data as mixed methods research. Advantages to using mixed methods approach are the potential for triangulation between data types and findings and the ability to adapt research instrument design to fit individual research questions within a study (Bryman, 2008; John W Creswell & Plano Clark, 2007; Punch, 2009). A mixed methods approach is necessary in this study to examine the experiences of all participants in modules using technology enhanced learning activities and to examine these experiences

through the lens of actual usage and measured educational impact of educational technologies.

In a concurrent triangulation mixed methods design this type of design qualitative and quantitative data are collected over a period of time, analysed and merged (Bryman, 2008; John W. Creswell, 2009; Punch, 2009). A framework, the five Ps framework, presented by Cameron (2011) considers philosophical, methodological, process, practical and political matters, and will be used to ensure that the research design is robust, thorough and fit for purpose, and to improve the generalisability, reliability and validity of the study.

4.6 Conceptual framework

Theoretical and conceptual frameworks are frequently discussed in works relating to research planning and design and definitions of each vary considerably and overlap in many areas. The categorisation of a framework as theoretical or conceptual appears to be based upon the number of theories used, and the nature of those theories. The most common descriptions of conceptual frameworks are that they are **constructs which explain ideas, assumptions, theories and relationships** (Antonenko, 2015; Evans, Coon, & Ume, 2011; Maxwell, 2012; Miles & Huberman, 1994; Ravitch & Riggan, 2012); and can be **either based upon existing formal theories or researcher hypothesis** (Ravitch & Riggan, 2012), and can be **used to guide research** (Antonenko, 2015; J. Collis & Hussey, 2009; Evans et al., 2011; Green, 2014; Maxwell, 2012; Miles & Huberman, 1994; Punch, 2009; Ravitch & Riggan, 2012; Robson, 2002). Maxwell offers a related perspective, considering theoretical and conceptual frameworks as not “existing” in literature as a whole but which must be “constructed” using elements from literature (2012, p. 41). Maxwell defines the conceptual framework as a “tentative theory of the phenomena that you are investigating, the function of this theory is to inform the rest of your design” (2012, p. 39).

A theoretical framework may form a component of the larger conceptual framework (Ravitch & Riggan, 2012). For the purpose of this research study the term “conceptual framework” will be defined using the common aspects above in combination with the definition of Maxwell (2012); and recognising the theoretical

base and perspective required by definitions of both theoretical and conceptual frameworks. In this project the term conceptual framework will be defined as follows:

The Conceptual Framework is a tentative theoretical 'construct' which explains the assumptions, theories and relationships underpinning a research topic; and can provide a theoretical lens through which a research program will be designed and implemented.

The use of an explicit conceptual framework is beneficial to a study and it can be used to strengthen a study in many ways (Antonenko, 2015; Evans et al., 2011). Conceptual frameworks are used to operationalise research questions, set bounds upon a study, strengthen literature review, design research and instruments, analyse synthesis and reduce data, and to connect questions, concepts, contexts and findings. Conceptual frameworks are most useful when there is a body of prior knowledge in a subject and are less useful when there is not (Punch, 2009).

Conceptual frameworks, similarly to theories, can be used in mixed methods research as a lens or perspective to guide the study (John W. Creswell, 2009). Carroll and Rothe (2010) explain a conceptual framework is required to effectively integrate qualitative and quantitative methods. Conceptual frameworks are considered as particularly useful when it comes to mixed methods studies, as they can help to design data collection phases which are compatible with each other and with the research questions whilst later aiding triangulation (Evans et al., 2011; Miles & Huberman, 1994). It can be argued that pragmatism, as a research approach, calls for the use of a theoretical framework in designing mixed methods studies to align epistemology and research design (Evans et al., 2011, p. 3). In this research study a conceptual framework will be used as a theoretical lens through which the research programme is designed and implemented.

Following the conceptual framework development process outlined by Miles and Huberman (1994) a conceptual framework has been developed for this study. It is based upon four perspectives of flexibility, identified by Collis & Moonen (2001) and further developed through a literature review. These perspectives are Implementation, Institution, Pedagogy and Technology. The categories presented by B. Collis and Moonen (2001) are used fully or as a base for understanding by many

researchers, including Bergamin, Ziska, Werlen, and Siegenthaler (2012). These researchers include Bergamin et al. (2012), Cornelius and Gordon (2008), Hill (2006), McLinden (2013) and Tucker and Morris (2011). Figure 2 shows the conceptual framework for this project which focuses upon Implementation at the intersection of the other perspectives.

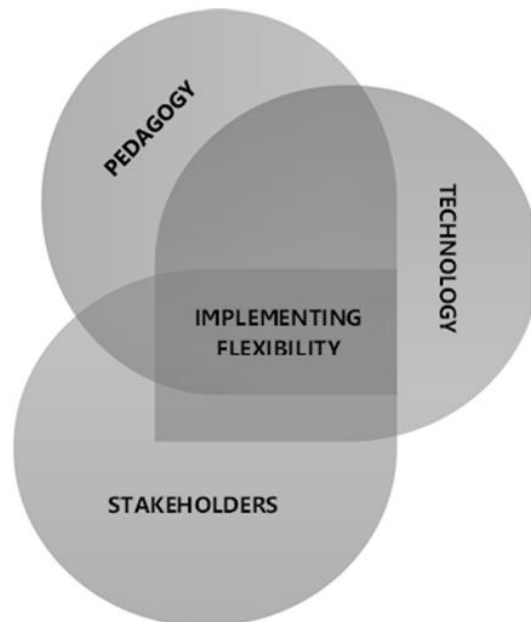


Figure 2 - Conceptual Framework underpinning for the Proposed Research

The next step in the development of the conceptual framework involved focusing upon implementation of flexible learning. Twenty six flexibility dimensions were identified and later grouped into 6 major categories. These dimensions form a theoretical frame which is embedded in the conceptual framework.

5. Conclusions

In this paper it is suggested that harnessing educational technologies to deliver flexibility in lifelong learning programmes is key to preparing the Higher Education sector for the challenge of the futures. This solution will allow the sector to navigate not only the resourcing issues and expected expansion of Higher Education in the future but also to contribute to solving the digital skills crisis in Europe. Furthermore it is proposed that a framework to guide and support practitioners in navigating these

waters in a pedagogically effective manner is needed if successful implementation is to be achieved.

Nine in ten jobs from 2015 will require digital skills (All Aboard, 2015; European Commission, 2014a). Over 40% of the European population do not possess the necessary digital skills (European Commission, 2014a). The changing working patterns and employment skills requirements mean that employees require higher skill levels to perform and have a greater need to keep skills up to date. This is placing pressure on the system at all levels. Adult learners have different needs to traditional learners. Postgraduate and continuing professional development courses particularly will appeal to many adult learners (National Forum, 2015). Flannery and McGarr (2014) explain that flexible learning can lead to increased access to Higher Education, particularly for these learners.

Based upon policy direction and changing demographics, recent projections from the Department of Education and Skills predict that by 2029 there will be 59,000 new entrants entering the Irish Higher Education sector per annum (DES, 2015, p. 10). This is an increase of 40% on 2009 figures.

The increases broadly align with international and EU expectations for Higher Education (European Commission, 2014b). This level of an increase is not unusual in the Irish Higher Education sector which has seen massive expansion in the decades since 1980. However the demographic profile and educational needs of the student body are changing significantly. Lifelong learners represented only 5% of new entrants in 1998 (O'Connell et al., 2006, p. 28), but had risen to 9% by 2009 (DES, 2011) By 2029 it is expected that almost one third of all enrolments will be from adult learners. These changes are happening against a backdrop of reduced funding and staffing levels in the sector.

Overall, Higher Education funding has decreased by 25% since 2008 (Hazelkorn, 2013). This has translated to a 20% average decrease in spending per student since the economic crisis began in 2008 (HEA, 2014a; National Forum, 2015). Alternative and sustainable funding models need to be considered (DES, 2011; HEA, 2014a).

Academic roles account for 52% of Higher Education positions, (HEA, 2014b). There have been reductions in staffing levels within the sector with whole time equivalent losses of 10% of academic roles and 17% of administrative roles. This is leading to increasingly poor staff to student ratios (HEA, 2014a; National Forum, 2015).

The types of pressures that the sector is under and the changing profile of learners means that simply scaling up current practices will not necessarily meet the needs of the sector or the learners. A Higher Education system that can cope with future demand is needed and must maintain current provision and focus on flexible delivery for lifelong learning and upskilling (DES, 2011; European Commission, 2015).

Flexible learning allows learners choice in time and place for study. In addition to increasing learner choice, technology has allowed the personalisation of learning resources based on learner requirements. This personalisation separates, according to Gordon (2014), flexible learning from blended learning. Technology supports both logistic and pedagogic flexibility (Flannery & McGarr, 2014; Gordon, 2014; Jones & Walters, 2015). Technology enabled approaches to flexible learning should be used to ensure that all learners become flexible learners (Gordon, 2014; National Forum, 2015).

Technology can help to make learning accessible and engaging to many adult learners (European Commission, 2015). The National Strategy for Higher Education to 2030 “could not even be considered” without harnessing technology (National Forum, 2015, p. 19). In addition, using technology to support education can help to prepare learners for the ‘increasingly digital world’ that we live in (2015, p. 5).

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