

Postgraduate researchers who teach:

How can national policy and the structured PhD centralise this forgotten tribe and celebrate their skills in tackling some of the current challenges in Irish higher education?

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Abstract

Some of the current challenges faced by Higher Education Institutes (HEIs) include financial constraints imposed by the economic downturn, the requirement to '*teach more with less*', and the use of the knowledge based economy to drive economic stabilisation and recovery. HEIs have adopted a number of approaches to address these drivers of change including centralising the postgraduate research student who teaches. The role of these postgraduate research students is one that is not often highlighted within the fabric of the HEI; however, these transient researchers play two key roles: full-time researchers and novice educators. Centralising and celebrating the research skills of this '*forgotten tribe*' can address some of the problems currently faced by the Irish higher education system. Postgraduate researchers are not, however, the panacea for all higher education ills. These researchers are primarily interested in research and additional teaching duties may distract from this core value. In order to maintain appropriate educational standards and to fully support these novice academics inclusion of suitable pedagogic training, as part of a structured PhD, is key. Apposite integration of trained and supported teaching postgraduates can benefit many key stakeholders; the undergraduate, the postgraduate and the HEI at large.

Further change is now the only constant for higher education. Schreuder (2013)

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Introduction: Current Challenges in Higher Education

Higher education is currently undergoing a huge rethinking, both nationally and internationally (Donnelly & Harding, 2015). Central to this is the economic downturn witnessed over recent years; however, other key influencing factors include the desire for increased higher education from a wider demographic and greater population base, and the increasing emphasis on knowledge based economies (Vincent-Lancrin, 2004). Depending on the ontological perspective, these drivers can be viewed as positive or negative. The current economic crisis, originating in 2008, was notable for its depth and the speed at which it crossed the world (Rose & Spiegel, 2012). These factors and the speed of the economic downturn forced governments to quickly address smouldering national issues; higher education being one of these universal issues. Within this sector several key points raised concern, including: public apprehension over the cost of higher education and subsidy afforded through public funds, massification (mass education) and the need for governments to attempt to stabilise their economic downturn through knowledge production and the knowledge economy (Hazelkorn, 2014). Governments and HEIs sought alternative approaches to reduce the effects of these issues; centralising the role and skill set of the postgraduate researcher may offer such an alternative. Centralising the postgraduate researcher will not solve all the current, and future, challenges faced by the higher education system. It can, however, offer a cost effective and sustainable method that would benefit the postgraduate, the undergraduate and, finally, the HEIs, as these stakeholders deal with huge changes in the higher education system.

Drivers of Change I: Funding Higher Education

Over the last number of years an increasing percentage of the world demographic want to further their education past second level. This leads to increased pressure on national governments to fund, or subsidise, further and higher education. The benefits of post-second level education can be seen on many levels including improved health, wealth and life expectancy. A more educated population is more likely to partake in the democratic process leading to obvious societal benefits (Norton, 2013). However, the subsequent financial burden placed on a national economy to deal with this increased public demand for further education can be crippling. It has been noted that third level funding often suffers more than other public funding directions, such as primary education and health, during times of economic depression (McLendon, et al., 2009). Governments have engaged with alternative policies in this area to deal with this problem. In Ireland, currently, third level education is primarily funded by public subsidy (exchequer funding); however, this was not always the case. Fees were the norm until 1995 when the government of the day removed tuition fees. This resulted in the Higher Education Institutions receiving compensation from the government in lieu of fees; which, in some cases, accounted for up to 90% of total institutional income (Keer, 2006). Initially, from 1995 until 2008, the funding was based on course fees and certified student enrolments; however, this lacked the required transparency and accountability. As the credit crunch tightened from 2008 onward, state funding for Irish Higher Education Institutes decreased by

approximately 25% and governmental insistence for improved quality, self-sustainability, transparency and accountability increased (Hazelkorn, 2014). Higher Education Institutes must now adapt to a new model of funding in order to survive and meet the annually increasing demand for higher education.

This funding model is evolving as part of this change and Irish third level students currently pay an annual contribution fee which covers the costs of registration, exams and other student services. This fee is predicted to increase year-on-year for the short term; the maximum contribution fee for the current academic year (2014-2015) is €2,750 and this will rise to €3,000 for 2015-2016 (Anon, 2013). However, the *National Strategy for Higher Education to 2030* suggests a graduate tax or an income contingent loan system in order to deal with the gap in funding for Higher Level education due to reduced state support (Hunt, 2011). Other alternatives also exist including education vouchers (akin to scholarships) and differential fees (based on ability to pay; Greenaway & Haynes, 2003).

It is clear that the governmental mantra is “*do more with less*”; and the Higher Education (HE) sector must adapt and evolve to the reality of current economic climate. Increasing student numbers is an obvious approach to reduce the exchequer-funding deficit. Non-exchequer funding, sourced in addition to the decreasing governmental support, is another alternative to fill the funding void. One popular source of non-exchequer funding is based on increasing international students within the HE sector. International students are required to pay a larger student tuition fee than national, or EU students in the case of Irish HEIs. The Irish Government's *International Education Strategy* is to increase the non-exchequer funding from international student recruitment to €1.2 billion per year. This is a €300 million increase on the 2012 annual rate (Finn and O'Connell, 2012). However, this approach should be taken with caution; as developing countries increase their educational requirements, simply exporting their students to be educated elsewhere will no longer be a viable option (Schofer & Meyer, 2005). Increasingly, collaborations and partnerships are developing between HEIs in developed world countries and developing world countries. This engagement could take the form of sharing educational resources (Downes, 2007) to full partnership and qualification accreditation (Flood, 2013). These more sustainable approaches will empower the developing countries in their quest for universal education for their population. Developing world educational empowerment will increase the already swelling numbers of people that want to further their education; either by traditional routes or non-traditional routes, placing a further strain on an already creaking higher education system (Altbach, 2010). Alternative and cost effective approaches to sustaining this enlarging system are required.

Drivers of Change II: Massification and Life long learning

Over the recent past there has been a huge increase in the numbers of students continuing to further and higher education; in many countries universal access to advanced education has been achieved (Altbach, 2013). Trow (2006) divided the world's higher education system into

three categories based on accessibility; elite (less than 15% of a given age group accessing post-secondary education), mass (between 20% and 30% of a given age group accessing post-secondary education) and universal (above 30% of a given age group accessing post-secondary education). Currently in Ireland, there is a greater than 60% transition from second level to third level. For example, in 2010 there were 43,000 new entrants to the higher education system, this contrasts with just 4,500 in the mid-1960s. It is projected that the total new entrants in the Irish higher-level system will be close to 65,000 by 2025 (Hunt, 2011). Although it appears that Ireland has achieved universal higher education status, problem areas in further and higher education remain. Ireland lags behind the EU average for participation in life long learning (7% of the population vs 10% EU average). This is in stark contrast to the Scandinavian model, which has a participation rate of between 20% and 32% (Anon, 2012a). The historical funding model in Ireland focused almost entirely on full-time, on-campus courses. This removed much of the flexibility that is required in the higher education sector. This sector is now slowly re-modelling itself to meet the demand to re- and up-skill workers who are transitioning in their career path whilst maintaining a constant supply highly educated, innovative and entrepreneurial graduates ready and capable of assisting in national recovery through the knowledge economy (O'Connor, 2013).

Drivers of Change III: The knowledge economy

The role of the university, and higher education institutes in general is changing. No longer can they exist as *'ivory towers'* untouched by the world around them (Bok, 1982 and Watson & Watson, 2013). Economic changes and increased numbers wishing to continue into further and higher education have encouraged HEIs to adapt and evolve. This transformation has simultaneously moved HEIs front of stage as key actors in the national, and international, recovery (Trani & Holsworth, 2010). Central to this transformation is the concept of the knowledge economy and the role higher education has to play in translating knowledge into economic profit.

The knowledge economy is built on the simple premise that knowledge enhancement can positively influence, and progress, the economy. Linked to this is specialisation, based on improved knowledge, which greatly improves efficiency and thus has a positive effect on the economy. Finally, cross-pollination of knowledge from different disciplines allows for new knowledge creation and alternative approaches to be implemented, again enhancing economic return. The knowledge economy is built iteratively; each innovation and each process progression is as a result of adding to, or amending, an existing process based on ever deepening knowledge (Metcalf, 2010).

Knowledge enhancement can take place in anywhere, anytime; however, investment in higher education can lead to directed and targeted progress in a shorter timeframe. This investment is generally focussed at the postgraduate level through research and development funding, resulting in an increased number of PhD students and postdoctoral researchers. In this area,

Ireland, as with other areas of educational reform, initially lagged behind Europe and the rest of the world. Ireland, experienced economical growth after the introduction of universal second level education, which in turn increased the demand for higher education. This was subsequently provided for by the abolition of higher-level tuition fees in the nineties. A talented and educated workforce then emerged in the early part of this century, and financed by a buoyant economy, the government invested €3 billion into fourth level research and development focussing on the science and technology sectors (Hazelkorn & Moynihan, 2010). The government rowed in behind this move towards knowledge production and the knowledge-driven economy. The National Development Plan (2006) placed higher-level education and higher-level research as central drivers to '*improve economic performance*'. However, as observed in other aspects of higher education, once the economic downturn commenced, so did the reduction of funding for the higher-level research. In the early years of the downturn (2009-2010), there was a 30% reduction in research funding (Hazelkorn, 2012). In order to maintain an acceptable level of research in Irish HEIs, governmental policy and initiatives have rationalised the type, scope and breath of research in Ireland. Hazelkorn (2013) outlines how various governmental policies have suggested a focus on '*clever copycat*' development more so than basic research (based on the Innovation Taskforce Report 2010) and more recently the identification of fourteen research priority areas emphasising industrial relevance (based on the Research Prioritisation Exercise, 2011).

Postgraduates who research: key players in knowledge development

Despite the rapid higher education evolution, research and knowledge creation remain cornerstones of most HEIs. The role of the doctoral research student is key within the HEIs research sphere. During the height of government investment into research there was a large emphasis on growing the number of PhD graduates year- on-year. The downturn in the economy resulted in an alternative approach to doctoral scholarships and research funding in general. The latest figures show that doctoral research is stabilising, and even growing modestly; a 2.3% increase in full-time PhD registrations was noted in 2011/2012. However, this contrasts with a dramatic reduction in full-time Masters by research of 18.3%. This suggests that those postgraduates interested in research are committing to a longer course of study, and thus, generating a deeper body of knowledge during their research (Anon, 2012b).

Currently, by far the biggest discipline for postgraduate research in Ireland is the Sciences, with almost 3000 registered doctoral students. This is almost double the next nearest discipline, Arts and Humanities, at 1,500 registered doctoral students. This contrast is even clearer when viewed in terms of international research students, almost three times as many international doctoral students are Science based researchers (approximately 750) compared to the next nearest discipline, Arts and Humanities (approximately 250). Overall Ireland is maintaining a stable position close to the OECD average for graduating PhDs, which suggests that the latest governmental policies are working in order to maintain Ireland's research base (Anon, 2012b). Ireland is also competing well on the global scale in terms of research output, maintaining a

position in the top twenty countries according to the Thomson Reuters Essential Science Indicators (Love, 2011). With limited funding, governmental co-ordination and rationalisation, postgraduate researchers are still at the forefront of knowledge generation. Furthermore, the doctoral researcher holds a pivotal, yet sometimes unrecognised, role in the higher education system as a whole.

Postgraduates who teach; a distinctive tribe with a key role

The core role of a postgraduate research student is to carry out specialised research in order to “*systematically acquire and understand of a substantial body of knowledge which is at the forefront of a field of learning*” (Anon, 2011). This body of knowledge can lead to directly enhancing the knowledge-based economy through, for example, a spin-out company formation. However, most postgraduate researchers also carry out teaching and learning duties during their postgraduate training. These duties may be voluntary, however, they may also be a compulsory component of their postgraduate training. Postgraduates who teach are often thought of as the ‘*forgotten tribe*’, or worse, casual ‘*slave labour*’ within the higher education model (McCready & Vecsey, 2013). Within Science, Technology, Engineering and Maths (STEM), the Graduate Teaching Assistant (GTA) plays a pivotal role in structuring undergraduate learning; particularly in the undergraduate learning laboratory. Indeed, in the laboratory the GTA often has more contact time with undergraduate students than tenured academic staff. For example at certain research universities almost all large undergraduate basic sciences laboratory instruction is provided by the GTA, in some cases as high as 88% (chemistry) and 91% (biology; DeChenne, et al, 2012). This trend is likely to be maintained, if not exaggerated further, by the increasing massification of higher-level education predicted both internationally and nationally (O’Connor, 2013). The postgraduate student thus maintains a key role in not only the development of the knowledge-based economy, but also in the education of the large cohorts of undergraduate students entering higher education.

In Ireland, this important role of the postgraduate in higher teaching is highlighted in the Hunt Report (2011), which recommends, “*a culture of enquiry and engaged scholarship should permeate the work of all higher education institutions*” (pp.54). The postgraduate researcher is central to the development and maintenance of this culture of enquiry. As active researchers and novice educators, the postgraduate holds a pivotal place at the interface of research and learning. Hunt (2011) recommends that all learning should be “*informed by up-to-date research*” and facilitated by “*open knowledge flows*”, and thus the postgraduate becomes a central player in the development of the undergraduate student. Hunt (2011) also outlines the need for a researcher career pathway, in which researchers are provided with opportunities to develop critical and life-long skills that will enhance the researcher and the hosting higher education institute. Hunt (2011) clearly recommends the provision of appropriate opportunities for postgraduate researchers to develop their pedagogical skills as “*researchers should, where possible, be afforded opportunities to participate in teaching such as laboratory supervision and tutorials*” (pp.16). Enacting Hunts recommendations could result in the benefits extending

beyond the postgraduate researcher, to the undergraduate student population and ultimately to the hosting higher education institute. The postgraduate student, in the GTA role, should be celebrated as being a member of '*distinctive tribe*' with much to offer (McKiggan-Fee, et al., 2013). The unique skill set offered by the GTA should be harnessed in undergraduate teaching, particularly in the STEM laboratory (Ryan, 2014).

Ideally, postgraduates who teach should teach in a stimulating environment and receive adequate support and guidance as they develop their teaching skill set. However, taking lab based Sciences as an example, lab teaching tends to be carried out by under-supported postgraduates. The increasing rise in the use of postgraduates can be aligned to the reduced budget in the higher education sector, and the mantra of 'teach more with less'. In simple terms, a postgraduate is much cheaper than a full-time lecturer. It makes economical sense to have several postgraduates running undergraduate teaching labs; thus reducing the institute's salary spend and relieving the over-stretched academic allowing him/her to concentrate on more scholarly activities (Park, 2002). The postgraduate is, therefore, often faced with large classes of early undergraduate students (typically greater than one hundred students), whom themselves are dealing with a considerable educational and life transition (Scott & Maw, 2009). Although it may make economic sense to allow postgraduates to teach undergraduate labs, it does not make ethical or pedagogical sense. The postgraduate can be placed in an uncomfortable position; coming from a pedagogical 'no-mans-land'. They must span the chasm of student and academic, often times with little or no training, which can result in ineffective teaching (McKiggan-Fee *et al.*, 2013). The GTA sense of identity also influences their ability to teach and demonstrate. Postgraduates have been noted to feel under-valued and under-supported by their institutes (Park & Ramos, 2002), which can result in tension and conflict as the postgraduate struggles to strike the balance between researcher and novice academic (Muzaka, 2009).

Structured PhDs: supporting the teaching postgraduate researcher

To fully harness the potential of the GTA as an important teaching thread of the higher education fabric, their institute must provide suitable support and training. Furthermore, maintaining proper teaching and learning quality standards would also underpin the need for GTA training. GTA pedagogical training would allow the PGD to become familiar with appropriate pedagogical approaches to teaching, learning and assessment. These are the common areas that most GTAs feel they require additional support before they commence teaching (Cho, et al., 2011). The European Association for Assurance in Higher Education (Anon, 2005) simultaneously recommends the fostering of "*vibrant intellectual and educational*

achievement” facilitated by “*qualified and competent staff*” (pp.14). This chimes with the recent European Modernisation of Higher Education Report (McAleese, 2013), which states “*quality teaching is a sine qua non of a quality learning culture*” (pp. 13). The role of quality assurance in higher education has increased in importance in recent years as HEIs seek to transparently demonstrate, for example, the standards of teaching (Lichtenberger, 2013). In order to maintain an acceptable level of teaching in all member HEIs, the EQNA recommend that staff involved in teaching should hold a minimum level of competence and, furthermore, staff should be afforded opportunities to develop and extend their teaching capacities (Anon, 2005). Building on this, recent national initiatives such as the National Forum for the Enhancement of Teaching and Learning support pedagogical development through professional development, recognition awards and a national digital and e-learning platform (Anon, 2015). However, these developments are primarily targeted at new full-time academics, not postgraduate researchers who teach.

As GTAs are not full-time academic staff, they fall into a grey area; they play an important role in the education of undergraduates, but they do not have to hold a teaching qualification. How can the need to train GTAs in the fundamentals of pedagogy align to ‘basic’ research ambitions of most PhD students? Most PhD students are in HEIs to research on their topic of choice; teaching is a secondary by-product that may result in the postdoctoral researcher choosing an academic career path. Not all doctoral researchers will choose an academic lecturing role. This may be through personal choice or the current poor employment prospects in this sector (Larson *et al.*, 2014). This seemingly contradictory scenario; the need to train in pedagogy to assure quality in their teaching duties during their PhD, but the non-universal requirement for direct pedagogical skills in their postdoctoral careers can alienate PhD students and reduce their effectiveness as GTAs.

Integrating pedagogical training for teaching postgraduate researcher

The structured PhD may offer a suitable compromise between structured training and the common master/apprentice model in doctoral education. It is common for postgraduates teaching training to take place at the end of a GTAs personal postgraduate research journey where the GTA attempts to gain as many supplementary qualifications as possible to enhance employment prospects (Beaton *et al.*, 2013). A more sustainable, efficient and effective use of postgraduate teaching training would be the integration of pedagogical training as a cornerstone of a structured postgraduate training course.

In an Irish context, the structured PhD is quite a new development with the IUA (Irish Universities Association) outlined the context of an Irish structured PhD programme as recently as 2009. Development of life long and employability skills was central to the Irish structured PhD, with the guideline that the “*development of the students’ research, generic and transferable skills*” should be carried out “*through a formalised and integrated programme of activities*” (as cited in Anon, 2011). At a European level the structured PhD has gained in popularity over the traditional approach to PhD research; in 2007 around 25% of HEIs offered structured PhD programmes, by 2010 this had risen to almost 66%. Additionally, less structured, short courses as part of a more traditional PhD are becoming more prevalent, rising from 50% of HEIs offering day-long courses in 2007 to 72% in 2010 (Dance, 2013). Providing students with structured training in the pedagogical fundamentals will not only enhance the GTAs ability to carry out their role as teachers but it will also improve the undergraduate learning experience. GTAs provided with pedagogical training have demonstrated the use their new skills in many aspects of their postdoctoral career, including those GTAs that do not progress into an academic life. Skills and characteristics developed during their structured GTA pedagogical training and GTA teaching duties that are used in their postdoctoral career include improved communication skills, enhanced ability to manage conflict, use of reflective practices and the development of self- confidence (Park, 2004). These are examples of the generic and transferable skills outlined as key learning outcomes in doctoral education.

Conclusions.

The higher education system has experienced huge changes over the recent past, and the sector in Ireland is no different. Drivers in this change process included the national (and international) economic climate, the increased desire to continue in education and the aspiration of a knowledge-based economic recovery. The economic downturn resulted in reduced public, exchequer funding available to support higher education. This, coupled with the increased number of students wishing to attend higher education, resulted in great financial pressure on HEIs. In an attempt to stimulate the economy, many nations are focussing on the knowledge-based economy to drive recovery. In Ireland, postgraduate research is central to this drive; however, reduced governmental spend in this area resulted in the need for innovative use of funding through targeted research and governmental guidance. Simultaneously; postgraduates, through their role as GTAs, may also supplement HEI academic staff to alleviate the problems of massification coupled with limited employment of new teaching staff. In order to assure the quality of teaching and learning, it is critical that the HEIs support their novice academic through specialised learning courses that would dovetail into a structured PhD. This approach would be beneficial to the postgraduate, through the development of life long and transferable skills; the undergraduate, as they gain from the trained GTAs experience; and the HEI, as the staff-student ratio would be more favourable. This approach, although not perfect, would centralise this ‘*forgotten tribe*’ of PhD researchers and celebrate their skills as key to knowledge development and enhancement.

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