Research Capacity Building for Development: Resources for Higher Education Institutions is a product of a new strategic partnership between Universities and Higher Education Institutes in Ireland and their counterparts in Malawi, Mozambique, Tanzania and Uganda. The Irish African Partnership for Research Capacity Building (IAP) was funded by Irish Aid, Ireland's Higher Education Authority and Universities Ireland under the Programme of Strategic Cooperation between Irish Aid and Higher Education and Research Institutes (2007–2011). Research Capacity Building for Development may be defined as the planned improvement of the capacity and competency of the Higher Education sector to conduct research that contributes to the alleviation of poverty. The IAP focus on Research Capacity Building is driven by recognition of the potential of the higher education and research sectors to contribute to achieving the Millennium Development Goals.

This book and accompanying CD are resources for all those concerned with Research Capacity Building. In addition to discursive chapters that provide background and context to this field, expert contributors from Ireland and Africa offer their insights into best practice in six thematic areas – research management, research bid writing, research finance, human resources, postgraduate research and ICT in Research Capacity Building. Models for the conduct of practical workshops on these themes are also included. Additional electronic resources are provided via the CD. Readers should also consult the integrated open access research repository within the IAP Web Portal at <www.irishafricanpartnership.ie> which also accommodates discussion forums, a research register and a digital repository.

The Irish-African Partnership for Research Capacity Building

Research Capacity Building for Development: Resources for Higher Education Institutions

Edited by Michael G Healy and Mary Goretti Nakabugo

THE IRISH-AFRICAN PARTNERSHIP
FOR RESEARCH CAPACITY BUILDING

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Department of Foreign Affairs
An Roinn Gnóthaí Eachtracha

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Research Capacity Building for Development: Resources for Higher Education Institutions

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We thank all University Presidents and other academic and administration staff in the participating institutions in Africa and in Ireland, as well as the Advisory Committee and the Executive Committee of the Irish-African Partnership for Research Capacity Building for their support in making the preparation of this resource book possible.

We especially acknowledge the support of all African and Irish institutions partnering in the Irish African Partnership, and all individuals who participated in the various project workshops, in particular the Malawi Summer School 2010, where the basis for this resource book first emerged.

Thanks sincerely to the authors of the chapters contained in the book. We recognise in particular the additional responsibilities undertaken by the Corresponding Authors, who undertook the duty of contacting and co-ordinating their co-authors, as well as liaison with the Editors.

This book is dedicated to all researchers in Malawi, Mozambique, Tanzania, Uganda and Ireland who continue to work together for the purpose of research capacity building for development and the alleviation of poverty.

Michael G Healy & Mary Goretti Nakabugo
September 2010

Common Abbreviations and Acronyms in the Text

EC	European Commission
fEC	Full Economic Costing
HE	Higher Education
HEI(s)	Higher Education Institution(s)
HEA	Higher Education Authority
HEAnet	Ireland's National Education and Research Network
HR	Human Resources
IA	Irish Aid
IAP	Irish-African Partnership
IAPRCB	Irish-African Partnership for Research Capacity Building
ICT	Information and Communications Technology
IP	Intellectual Property
ISP	Internet Service Provider
MDGs	Millennium Development Goals
NDLR	National Digital Learning Resources
NRENs	National Research and Education Networks
PI	Principal Investigator
PSC	Programme for Strategic Cooperation
QR	Quality-Related
RAE	Research Assessment Exercise
RCB	Research Capacity Building
REF	Research Excellence Framework
RSO	Research Support Office
TRAC	Transparent Approach to Costing
VLEs	Virtual Learning Environments

Irish African Partnership Participating Institutions

Dublin City University	DCU
Makerere University	Mak.
Mary Immaculate College	MIC
National University of Ireland Galway	NUI Galway
National University of Ireland Maynooth	NUI Maynooth
Queen's University Belfast	QUB
Trinity College Dublin	TCD
University College Cork	UCC
University College Dublin	UCD
University of Dar es Salaam	UDSM
Universidad Eduardo Mondlane	UEM
University of Limerick	UL
University of Malawi	UNIMA
University of Ulster	UU
and	
The Centre for Cross Border Studies	CCBS

Chapter 1

Research Capacity Building Resources for Higher Education in Development

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Background

The Irish-African Partnership for Research Capacity Building (IAP), funded through the Irish Aid (IA) / Higher Education Authority (HEA) Programme for Strategic Cooperation (PSC)[1], brings together all nine universities on the island of Ireland[2] and four universities in Sub-Saharan Africa (The University of Malawi – UNIMA; Universidad Eduardo Mondlane – UEM, Mozambique; The University of Dar es Salaam – UDSM, Tanzania; and Makerere University, Uganda) in partnership to develop a coordinated approach to Research Capacity Building (RCB) in higher education institutions (HEIs) in order to make an effective contribution to poverty reduction. The fundamental aim of the IAP is to advance effective policies and strategies for sustainable RCB through a partnership approach which supports mutual learning.

Ireland is playing a significant role in international development co-operation. In recent years the Higher Education (HE) sector in Ireland has adopted a practical and effective role in the international development field. Development research in the HE sector is gradually becoming multi-disciplinary, mainly driven by the Millennium Development Goals (MDGs) and linked priority areas such as water resources, food security, human rights, education, health, gender and climate change within the wider framework of development and inter-dependence. The international development field tends to bring about a measure of consensus and is open to inter-institutional cooperation in ways that may be less realistic in other domains. Collaboration in working towards a global development agenda has the potential to generate coherence among Irish HEIs, and show that the HE sector can work in tandem with national governments to achieve agreed objectives, and simultaneously contribute towards social responsibility.

The IAP project represents a new direction for Ireland's international development agenda throughout the university research system. The challenges for HEIs in partner African countries are serious. A decline in per unit costs (from US$6,800 in 1980 to US$1,200 in 2002) amid rapidly rising enrolments; insufficient numbers of qualified academic staff in HEIs as the result of brain drain, retirements and HIV / AIDS as well as low internal and external efficiency, and poor governance have all been factors contributing to a crisis in the sector and in public confidence in the quality of education offered by the University sector (Materu, 2007: xiv). In turn, the collapse in funding at African universities has led to a sharp deterioration in the quality of research, teaching and learning in those institutions. The most serious obstacle to RCB in Africa is the reduction in research activity, the continuing weakness of academic mentoring, and the relative scarcity of collaborative projects (Sawyerr, 2004). Policy makers and practitioners in development fields depend on the availability of reliable evidence for planning and practical purposes, but the research required to support the generation of such evidence is frequently unavailable, or cannot be carried out in a timely and comprehensible manner (Brugha and Byrne, 2010). There are parallel difficulties that commonly arise when researchers' lack of capacity, skills and resources to conduct the research and to manage the research environment, lead to an inability to leverage

policy and practice through evidence-based reasoning arising from the research process. Correspondingly, there is a significant gap in research capacity between countries in the North and South with the latter countries lacking "the appropriate self-sustained research capacities both in the numbers and quality of trained researchers and appropriate institutional capacities for high-level research" (Nchinda, 2002: 1701).

Nevertheless, counterparts in the North are not without problems, especially in regard with research capacity for international development. Within the Irish university system, for example, research capacity in international development is generally weak, characterised by fragmentation, with individual researchers mostly undertaking individual projects in relative isolation (Gaynor, 2009; Barrett *et al.*, 2010). The separatist structures of most Irish universities pose further challenges to the innately interdisciplinary nature of development research. Consequently, the quality of much international development research is poor, its linkages to policy weak and its impacts on poverty reduction are currently minimal.

The IAP is a unique mutual partnership which attempts to build research capacities within the North and the South. It aims to build capacity in international development research in the nine partner Irish universities, build research capacity in health, education, gender and Information & Communication Technologies (ICT) within the four partner

African universities, and in the longer term develop an Irish-African network of excellence in international development research. The IAP considers that research capacity derives from an interlinked set of relationships at the level of the individual, the HEI and systemic inter-institutional collaborations. This view is rooted in the conception of RCB by Trostle (1992: 1321-1324) who defined it as 'a process of individual, institutional and inter-institutional development which leads to higher levels of skills and greater ability to perform useful research.' While on one level RCB may be defined as the planned improvement of the individual or the institution's capacity to conduct research, the IAP seeks also to address practical issues on the ground which may act as factors that militate against this happening.

Building research capacity through partnership

The IAP's particular focus on RCB derives from the 'greater recognition of the potential of the higher education and research sectors in developing countries to contribute to achieving the MDGs' (Irish Aid, 2007: 2). As a corollary of this, there is a need to ensure that development-related research is adequately supported, both in terms of personnel with appropriate knowledge and skills as well as in terms of appropriate infrastructure. International agencies like the United Nations Educational, Scientific and Cultural Organisation (UNESCO) and the World Bank have recently stressed the

essential role HE plays not only in educating leaders for all sectors of society, but also in generating the research required to improve living standards that make for sustainable communities. Among their recommendations such agencies strongly advocate the creation of international networks and research partnerships, arguing that 'international involvement helps countries guard against parochialism and remain open to broader economic, intellectual, technical, and social possibilities' (World Bank, 2000: 42). The IAP project represents one example of an international network for RCB.

One of the first initiatives undertaken by the IAP towards identifying the need for, and potential of partnership in building capacity for research involved a detailed survey of stakeholders' views (Barrett *et al.*, 2010). The stakeholder consultation sought to establish a baseline understanding of research capacity for international development in the Irish universities as well as research capacity in general in the four participating African universities. The consultation was conducted to elicit the views of administrators and researchers within all 13 universities on the opportunities and constraints relating to RCB at both institutional and individual levels, and their views on possible ways of overcoming any barriers identified. Many of the opportunities and constraints to RCB cited by the interviewees during the field research were of a generic nature, and applicable almost irrespective of either the thematic area of research engagement or

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geographic location. These generic factors included, among others, the need for a clear and coherent research policy framework, a nurturing and enabling environment for research at institution level, funding support and research infrastructure. In terms of addressing the barriers, the general consensus was that any interventions needed to be on-going, long-term and sustainable, with the genuine potential to confer sustainable benefits into the future.

The Summer School Model as a long-term RCB approach

To move forward on a long-term and sustainable RCB agenda, a two day workshop was convened in DCU in October 2009 involving African and Irish research university officers and senior personnel involved in the IAP. The purpose of this event was to begin the process of inter-institutional collaboration in international development research and to produce a plan for a 'Training the Trainers Workshop' to be held in Malawi in 2010 in a 'Summer School' format which could be replicated in future.

The Malawi Summer School held in March 2010 was demand-led. The objective of the Summer School was to enhance human capacity in research management in research offices and among research team leaders based in the African partner institutions. The intended outcomes of the Summer School were to up-skill participants for better and more efficient research management and delivery of research in partner institutions, while at the same time

providing the foundation for more quantity and quality of research and more relevant research for development. The Summer School, which provided for 70 participants, consisted of a combination of plenary sessions and workshop sessions. The workshops comprised six self-contained modules, and the module topics were chosen in response to priority needs identified through consultation and agreement of senior management of all IAP institutions – in Africa and in Ireland. All module content was initially covered in outline in plenary sessions, with subsequent half-day workshop sessions in smaller groups which provided participants with more detailed knowledge and skills relating to the respective topics. The key audience in Malawi was drawn from various support sections in the universities including academic staff, librarians, human resources personnel, ICT and finance staff. The IAP Stakeholder Consultation revealed that African research personnel felt disadvantaged in pursuing research opportunities by a deficit of 'process-related' skills. Accordingly, the Summer School focused on six topics, each facilitated by expert teams drawn from Irish and African partner institutions:

i.   Research Management
ii. Research Bid Writing
iii. Research Finance
iv. Human Resource Management
v.   The Role of Information and Communications Technology in RCB
vi. Graduate Schools, Graduate Supervision and Structured PhD Programmes

The Summer School Model conferred highly practical benefits for building research support capacity among the southern partner institutions in particular. It responded to clearly identified needs to equip research management staff and research support officers / coordinators from the four partner institutions in Africa with improved skills for sourcing and managing research projects and resources. It helped to promote greater articulation between academic and scholarly research on the one hand, and university management and administration on the other. It also clarified in greater detail the wider poverty reduction, climate change, and MDG-related policy imperatives that underpin the PSC agenda.

Resources for RCB in Development

To effectively and appropriately disseminate the ideas that underpin the RCB models adopted by the IAP, this book and the accompanying CD provides a package of transferable resources based on the key learning acquired during the RCB Summer School workshop first delivered in Zomba, Malawi. Its production was driven by the specific challenges, demands and constraints that many African researchers and university managers / administrators encounter within the respective HEIs as they seek to build research capacity both personally and institutionally. Based on lessons from the Summer School, these resources aim to provide baseline principles and practical guidance to assist partner HEIs in their efforts to overcome the main barriers to building research capacity.

The guidance models for RCB presented within this package of resources are based on a suite of relevant information. Some of the material is of a theoretical / academic kind, while the balance is of a practical / operational nature. Chapter 2 provides a broad context within which the IAP and the resource book are situated. In Chapters 3–8, several authors with specialist expertise in the workshop topics referred to above provide discussion and description of these topics from the perspective of their professional fields, with background information and context intended to provide skilled insights for future workshop tutors and tutees. Chapter 9 and the accompanying inset CD provide users of the IAP RCB model with an exemplar workshop template, offering guidance to workshop tutors and tutees on how they can effectively mediate the knowledge and skills of the six RCB themes to their respective institutions and relevant staff cohorts. This template, or any modified version thereof, will provide a ready-made framework that can be adapted for local use within individual HEIs or among HEI networks for collaborative professional up-skilling programmes. In addition, the CD and IAP's digital repository (see Chapter 8) provide electronic versions of all the chapters contained in this book for ease of reference and e-Learning activities. Some informal additional material relating to the series of IAP workshops conducted over recent years is also included on the CD. We hope that *Research Capacity Building for Development: Resources for Higher Education Institutions*

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will help those institutions who adopt this resource to attain better and more efficient management and delivery of research administration for research development and capacity building.

Chapter 2

Higher Education and Research in the Service of Development

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Development policy – zigzagging towards convergence?

In a world of contradictions and paradoxes, possibly the greatest of all is that over the past 25 years global food production has grown more rapidly than global population, and yet millions starve. We have reached a point in our history where more people than ever before live in hunger and poverty. Worldwide, one person in six goes hungry; one child dies every six seconds – five million children each year – from hunger and the diseases it causes; every year throughout the world almost 10 million children die before their fifth birthday; and based on current trends, child deaths in Africa alone are set to grow by an additional 700,000 a year (WFP, 2010).

These realities are both simple and stark, but the solutions to them have proved to be complex and elusive. A layperson's view of the ostensible efforts of both governments and donors to stamp out poverty in Africa over four decades would consider the cumulative investments of time, resources and personnel to date to have been less than successful. Arguably, successive policy interventions (such as mass vaccination programmes, universal primary education, high yielding crop varieties, infrastructural investment), each vital in its own way, have been too disconnected and disjointed to tackle poverty in a sufficiently comprehensive way. Hence the quest in recent years for a more joined-up approach, emphasising coherence and concerted action across all of the key development sectors, as envisaged in the 2005 Paris Declaration and the subsequent 2008 Accra Agenda for Action (OECD 2005 and 2008).

Reality dictates that life does not come neatly packaged in issue areas, ripe for policy intervention; policies designed to address one issue are bound to have an impact on others, and so the high level goal of reduction of poverty needs to be pursued on many converging fronts simultaneously.

The central thesis advanced in this article is that HE and research have a vital role to play – alongside government and wider civil society – in giving operational effect to this joined-up, evidence-based development approach, in a way which puts peoples' needs first, and which has poverty alleviation and – beyond that, poverty eradication – as its overarching goal.

Tension between the 'knowledge economy' and development?

At a time when socio-economic development is rapidly becoming more knowledge-

intensive and relies increasingly on professional and managerial specialists with advanced training, the role of HE becomes a crucial element for a balanced and coherent national development strategy. This is especially true for developing countries.

Though this may seem axiomatic now that the information age and the digital divide are to the forefront of our thinking, contrary views prevailed not so long ago. In the mid 1980s, scepticism was rife about the merits of public investment in HE in less developed countries, questioning the contribution of HE to economic and social development relative to other stratagems. In particular a World Bank (1986) study presented conclusions based on comparative analyses of rates of return to investment in different levels and types of education across different regions of the world. It also compared the returns to individuals (the private rate of return) with the returns to wider society (the social rate of return). One of the central conclusions was that in most developing countries "the present financing arrangements constitute a misallocation of resources devoted to education" because "higher education was the relatively less socially efficient investment" (World Bank, 1986: 9-10). This finding was widely quoted and exerted considerable influence on the lending policies of the World Bank itself, on domestic priority-setting by governments at country level, and on the aid strategies of international donors in the two decades that followed.

The unduly arbitrary segmentation of

education implicit in this analysis ran counter to the more integrationist view of HE's role in development which has re-emerged in more recent years. The essential inter-dependence between the different levels of education can be demonstrated very clearly with reference, for example, to *MDG 2 - achieving universal primary education.* In the final analysis, how can this goal be realised without high-quality teacher education, accompanied by properly moderated state exam systems, a rigorous school inspectorate, reliable information management and other associated infrastructural frameworks, all of which link directly back to the indispensable role of HE as a repository of expertise and builder of capacity for these very functions? The same rationale holds true of the other key sectors of health, water, sanitation and agriculture and food.

An acknowledgement of this compelling logic is discernible in the influential Report of the Task Force on Higher Education and Society, which though commissioned by the World Bank, distanced itself from – and superseded – the earlier orthodoxy of the mid-1980s "relegating higher education to a relatively minor place on its development agenda" (World Bank 2000: 39). The earlier basis of calculating the social rate of return was shown to have been unduly restrictive (relying largely on relative earnings data), and had therefore underestimated the indirect benefits of education to society ('externalities'). But in the meantime the damage was done: "for the best part of a generation, university faculty salaries remained flat or declined,

research funding dried up, university libraries stopped purchasing books and journals, physical facilities crumbled, new building was terminated, …. student scholarships were largely eliminated, ….and new faculty hiring was curtailed." (Szanton and Manyika, 2008: 2). The onset of the HIV and the AIDS pandemic further depleted the human resource base in HE in Sub-Saharan Africa.

Teferra and Altbach (2003: 13) suggest that "the problems [facing Africa's universities] are difficult and may even be getting worse as the pressure for academic and institutional expansion comes into conflict with limited resources". However, the situation is not considered irretrievable, with the authors pointing to three very positive trends which inspire hope:

- the emergence of democratic political systems in certain countries of Sub-Saharan Africa, along with a more vibrant civil society across the continent
- a revival of collective self-confidence in African HE, and the renewed commitment by many to build successful and resilient institutions despite difficult circumstances
- recognition by leading donor agencies that investment in African HE is vital for development

Aid Effectiveness: Where does research fit in?

To be effective, pro-poor policies need to operate across multiple sectors and to do so in an integrated way which promotes alignment, harmonisation and coherence,

(cf the Paris Declaration 2005 and the Accra Agenda for Action 2008). Coherence between external donor initiatives and those of host government, combined with mutual alignment and complementarities between donor agencies themselves, can help ensure that policies across a range of issues support, or at the very least do not undermine, the attainment of development objectives. "Put simply, policy coherence is about ensuring that time and effort is not wasted by actions in one sphere, undermining actions in another" (House of Commons, 2004).

Historically it has proved difficult for policy-makers and other stakeholders to identify which policies are most suitable when dealing with national priority issues, and to ascertain how best policies can be implemented in different contexts. This is because of the sheer variety of endogenous factors, and the difficulty of precisely attributing cause-and-effect. Despite these inherent problems, the ethical imperative of ensuring a better quality of life for the poor, as well as sustaining the planet beyond the crux of 'peak oil', call for a better understanding of how research in the areas of education and poverty can contribute to pro-poor policies and help improve development outcomes.

The link between research and policy in the area of development is of increasing interest to both researchers and policy-makers. Both parties are interested in knowing what works. Many research findings are available to

inform policy-makers on poverty prevalence, HIV / AIDS, unemployment, better quality health and education, and service delivery, but more often than not a gap exists between research results and policy development, and the desired outcome of putting research results into practice through research-informed policy implementation. This is of particular concern in terms of the challenge of meeting the MDGs.

However policy-making is a complex activity, in which evidence competes in parallel with other factors such as values, ideology and political pressure. Consequently, "researchers need to present their research in such as way that political undercurrents are removed" (Maile, 2008: 42). Everywhere there is a critical need to generate knowledge that can be used to improve service delivery, policies and practices. Such an evidence-base is particularly important when it comes to baseline surveys conducted prior to implementation of a policy initiative, comparative studies of target groups vis-a-vis control groups, rigorous and systematic formative and summative evaluation of policies and their implementation, and ex-post impact analysis.

Findings from a recent Irish-African study across HEIs

As already mentioned in the preceding chapter, the IAP carried out an extensive Stakeholder Consultation exercise in 2008/9, involving face-to-face and focus group interviews with over 300 academics engaged in research across partner institutions in

Ireland, Tanzania, Uganda, Mozambique and Malawi (Barrett *et al.*, 2010). The scope of this exercise covered the challenges, opportunities, constraints and priorities for the research function in HEIs, as well as for RCB. Not surprisingly, many of the findings emerging from this study had validity not only for research in the international development domain, but across the board, irrespective of either the thematic area of research engagement, or geographic location. Such factors include:
- the need for a clear and coherent research policy framework
- nurturing an enabling environment for research at individual HEI level
- funding and infrastructural support
- career structure for research personnel
- a mentorship culture
- the influence of national research assessment exercises (RAE) where these exist

Extracting from the Stakeholder Consultation, both what was said and what was not, two clear conclusions emerged from this exercise. Firstly, the dearth of expertise in applied policy analysis in the southern partner countries became clearly evident. Secondly, the need for university researchers everywhere to engage more effectively and systematically with the public policy domain, with civil society (including NGOs) and with other development stakeholders was highlighted. These outcomes may help sharpen the relevance of research to policy context / problem-solving and dissemination of findings, in particular in the global South,

without compromising autonomy, rigour and independence.

This is not to suggest that HEIs should somehow re-invent themselves as development agencies or advocacy interest-groups. But such is the urgency and scale of the twin challenges of poverty reduction and sustainability of the environment that these must become central points of orientation for our institutions; they need to be mainstreamed into the day-to-day work of teaching, research and civic engagement in-country, and they must act as the 'glue' for strong long-term North-South collaborative partnerships that reflect growing inter-dependence.

This presents a challenge to all of us in terms of the conventional, sometimes restricted understanding of the role of HE, both within the system and outside it. By way of illustration, and going back to our Stakeholder Consultation exercise, a word search of all transcripts of interviews conducted revealed that 'poverty reduction' merited only one mention. Of course it would be a fallacy to infer from this that all the other 300+ interviewees were callous, hard-hearted, uncaring characters who were either oblivious to or in denial of the immense scale of human suffering and misery. Equally, it would be unfair to read too much into the non-appearance of a particular phrase in a range of responses to a particular set of questions posed within a specific context. Nevertheless, the fact that it scarcely appeared on the radar raises unsettling

questions regarding:
- the nature of the contribution of institutional-based research to the great human challenges of our time
- the underlying factors which determine the choice of priorities for research
- the means of disseminating findings in ways which translate into more humane, equitable and pro-poor public policy

Mediating the discourse between HE and development
The HE sector often fails to do justice to its own essential contribution to human development, partly because the language of discourse which it tends to use is not fully shared with those who are more directly engaged in policy and practice. Perhaps the description of a research question or hypothesis tends too often to be couched in terms which are accessible to the academic or specialist peer audience, to the exclusion of a more generalist audience who might well be enthused by the potential of a research application to transform livelihoods or to be a catalyst for social change. Perhaps also the mechanisms for disseminating research findings which are of potential importance to development policy and practice need to be broadened beyond the traditional peer-reviewed journals, to include web-based resources and broadcast material.

Conversely, HE especially in Africa has historically been ill-served at the apex of public policy, such as at national governments and major donor agencies. We have already seen how, for most of two

decades, HEIs were hopelessly overstretched by a combination of dwindling resources and rapid 'massification' of enrolment. This occurred under the simplistic mantra that, dollar for dollar, the rate of return on investment in basic education was greater than for HE – though one may ask how could it be otherwise? In consequence, a generation of academic talent was all but lost, with significant damage to the human capital base of HEIs, depleted of key skills in agronomy, medicine, hydrology, pedagogy, applied statistics, law, public administration, journalism, engineering, business and commerce.

At long last, the penny has begun to drop among high level policy makers that integrated national development strategies and sector-wide approaches to education must of necessity include the revitalisation of the HE sector. Nevertheless, there remain significant pockets of scepticism about HE's essential role in national development, not least in many Ministries of Finance around Africa. By way of illustration, addressing a European Universities Association event in February 2010, Sibry Tapsoba, Head of the African Development Institute, said that his institution now strongly favoured providing funding for strategic development in HE precisely because of its multiplier effect throughout the economy, but was being thwarted by outmoded preconceptions within most national Ministries of Finance. It would appear that Southern HEIs are thus presented with a challenge of working to dispel these preconceptions through persuasive networking and lobbying of their respective Treasury departments, and demonstrating the transferability of their research across the policy spectrum.

Conclusion

Although bridging the research-practice-policy gap is rarely straightforward, better use of evidence-based research in development policy and practice can save lives, reduce poverty and improve quality of life. The term 'evidence-based' is used here, firstly because this is where the HE can add distinctive value to the policy process, and secondly in order to differentiate evidence-based policy from ideology-based policy which relies heavily on selective use of evidence and untested views of individuals or groups.

The resources contained within *Research Capacity Building for Development: Resources for Higher Education Institutions* offer some building blocks by which institutions can more effectively and practically overcome this research-practice-policy gap. HEIs can move to bridge the gap by (i) ensuring that their research connects with real and defined needs in the wider community, and that their contributions to development fields are conveyed in plain language; (ii) interfacing effectively with the policy environment by researchers becoming informed on how government works, as policy is shaped as much through its implementation and ongoing review, as through its initial formulation; (iii) nurturing structured dialogue with

user-communities, via NGOs, faith based
and other organisations to systematically
build community consultation processes into
research methodologies; (iv) recognising and
rewarding staff who demonstrably practice
sustained civic engagement; and (v) finding
new and effective channels of dissemination,
in order to 'get heard', and opening up
communication to policy-makers as well as
partnering with civil society groups.

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Chapter 3

Research Management

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Introduction

This chapter outlines the key responsibilities
and activities associated with research
management in a HEI setting. It introduces
key aspects of research contracts including
key risks and compliance issues and how
to manage them, as well as providing
an understanding of the key principles
associated with research ethics and integrity.
Research management involves the provision
of professional expert advice, coupled
with internal structures and processes to
maximise the quality and impact of research.
The HEI should be viewed as a supporting
ecosystem with all staff, researchers and
units facilitating the core education and
research mission of the institution. At the
core of the research management system is
the Research Office or its equivalent which
works in conjunction with other institutional
services such as finance, human resources
(HR) and estates, whose combined role is
to support research activity through expert
advice and support. The chapter is broadly
structured around the Research Management
Cycle shown in Figure 3.1 which illustrates
the key research management functions
required to support research.

Background

Research management systems within
HEIs exist to support research excellence
within the institutions. The evidence for
their value comes through the quality and
quantity of research outputs generated
by staff. These outputs range from grant
awards for new research projects, peer
reviewed academic journal publications,
conference presentations, high quality post
graduate students, contributions to informing
government / national policy, and the
economic impact associated with industrial
development and commercialisation of
Intellectual Property (IP). There is an onus
on institutions to disseminate the outputs of
research to as wide an audience as possible
from institutional electronic repositories to
public media sources. Research activities do
not operate in isolation. They are informed
and guided in the long-term by regional
and national needs and priorities. Examples
of such needs and priorities, and the
corresponding research funding sources
available should be made known to all
participants in the research process. There
may also be additional contextual information
ranging from the expected outcomes of
research programmes, such as job creation
and national and international collaborations
that can be usefully relayed.

Research Management

9. Outputs

1. Information

2. Internal Research Funding

3. Proposal Preparation

4. Proposal Submission

Industry

8. Reporting grant claims

Research Management Cycle

5. Research Contract

7. External Audit

6. Project Management

10. Strategic and policy Framework

Figure 3.1: The Research Management Cycle

In the majority of cases research projects proceed broadly according to plan, notwithstanding that the outcome of research is not guaranteed by its very nature. However, issues will arise in some instances, and staff will benefit from expert local impartial advice from the Research Office, the Finance Office and HR. Typical issues include drift in budget expenditure plans, recruitment and / or loss of staff, the need for additional space and research infrastructure requirements.

Funding information

Put simply, resources are required to drive research activities. These may include library facilities and internet resources for

social sciences, laboratories and research equipment for the natural sciences and salary / scholarship costs for research students and research staff. The bulk of funding to sustain university research is obtained from external national and or international sources through competitive peer reviewed schemes and programmes. However, there is also a role for internal institutional funding in terms of supporting new emerging areas, providing some core funding to key strategic areas / centres, supporting new staff members to initiate research and develop credible track records and to provide support resources for areas that are typically not supported by

external funding. In a time when all HEIs are experiencing reduced budgets, such internal funding should be used wisely to support strategic research priorities. Ultimately, internal funding should be aimed at increasing the success of staff in attracting external funding. Examples of internal competitive funding support programmes may include budget lines for research travel support, international visitors programmes, equipment maintenance funding, a research career-start programme, postgraduate research scholarships, postgraduate accommodation scholarships and publication assistance funds.

External funding sources at the national or international level are numerous. The challenge is identifying sources of funding that offer realistic opportunities to staff. The main sources of funding information are websites, research funding databases and funding agencies mail lists which are typically sent directly to research offices for dissemination. To a lesser extent, and depending on the national context, direct lobbying of government departments and funding agencies may play a role in helping attract research funding. From a research management perspective it is essential that the right information is delivered to the right people. Where feasible research funding information should be tailored and communicated to the relevant faculties, schools and, in some cases, to specific staff members to avoid information overload for staff that have many activities to cope with. In practice, there is no single best method

to communicate effectively – a variety of approaches should be taken, including Faculty / School briefing sessions, emails, internal WebPages, direct mailing via printed research bulletins and direct personal contact.

Funding proposals
Competitive professional research proposals have to be developed as the first step to attracting external funding success. Research Office staff can provide expert and informed advice for staff, including examples of previous successful proposals to help maximise the chances of research funding bids. It is useful in certain circumstances for staff to use internal peer review for constructive feedback on proposals prior to submission to an external agency. The format and layout of the curriculum vitae (CV) of staff members is crucial to convey important information on the qualifications and experience of staff to external funding agencies. CVs should be optimised and not simply consist of lists, such as book chapters and refereed papers (see Chapter 4). Innovative CVs that highlight the strengths of staff members that are relevant to the funding call in question are critical. For example, staff members could choose their top five refereed publications and write few lines on why they believe these publications are significant in the context of the funding proposal at hand.

Research proposals to external funding bodies require an internal compliance check, for example in relation to project costing

/ pricing approval (see Chapter 5). Most external funders require an institutional sign-off before they will accept a proposal. It is also valuable for tracking purposes that copies of all proposals are retained on file by the institution for reference purposes. Also, there is an increasing use of electronic proposal submission which often has to be carried out by the Research Office or equivalent. HEIs need clear protocols that specify who is authorised to sign-off on research proposals and who retains copies of research funding proposals for reference purposes.

Contract negotiation

If a research proposal is successful and receives funding, a contract will be required. In the case of national and certain international funding agencies, the contract is in a standard format familiar to all parties. However, in the case of one-off contracts with NGOs or industry for example, a case-specific contract will have to be prepared, negotiated and signed-off by the respective parties. Research contracts are increasingly complex but remain a necessary part of good practice in research management. They serve the functions of protecting all parties; clearly defining the role, responsibilities and expectations of all involved; define price, currency and payment method, and timing of payments; set out ownership and / or terms and conditions of access rights to IP and other rights, such as around publications and PhD Theses; and critically, they deal with protocols for resolving disagreements.

HEIs need to have established systems of governance regarding responsibility and expertise for drafting contracts and negotiating with all of the parties involved. Typically, such expertise is developed over time and through experience within institutional Research Offices and where necessary additional legal advice is sought. The research management process must identify who signs research contracts on behalf of the institution. It is beneficial for HEIs to develop approved standard legal template agreements that can be used with minimal amendments, as this will reduce costs and streamline contractual processes. Such agreement may cover areas like collaborative research agreements, non-disclosure (confidentiality) agreement, including one-way and two-way agreements, and material transfer agreements. It is challenging to manage the risks associated with a growing research contract portfolio at the institutional level.

The mission of HE is the discovery and transmission of knowledge and the public service environment is highly conducive to the conception and development of many forms of IP. There is always the possibility that such developments may have commercial value, the possibility for which may be enhanced through the use of patents and other forms of IP rights. HEIs should recognise and continue to foster and support the development of inventions for public use.

In this context IP rights are a key element of research contracts and in practice they

Information Box 3.1: A contract basics checklist for the Research Support Office

- The contract must state clearly the duties of each party. Clearly specify what risks and obligations you will accept and not accept
- Get the timescales right
- Check the finances and potential taxation issues
- Pick a suitable set of contract conditions related to scale and risk in each project
- Check the right to publish provisions in the contract and the right to conduct a PhD viva voce
- Examine the termination clause and the dispute resolution process carefully
- Check that the appendices are correct and contain all the relevant information
- Get legal / professional advice if unsure or uncomfortable with any provisions
- Be sure all terms and conditions are to your satisfaction before giving final approval

are a central discussion point in the contract negotiation process. IP provides legal rights, regardless of whether they are based on registration, that aim to protect creations and inventions resulting from intellectual activity in the industrial, scientific, literary or artistic fields. IP agreements regulate ownership of IP, such as trademarks, patents and trade secrets / know-how. IP rights are of greatest significance in research contracts involving multiple parties and / or industrial parties where there is potential to commercialise the products of research. Industrial partners will want to be clear on the terms and conditions associated with their access to IP rights. HEIs need to understand the potential financial benefits accruing where research outputs contribute to commercial profits.

It is important that research contracts are executed correctly. If not it can be costly in terms of legal costs and reputational damage when things go wrong. Contractual risks that should be borne in mind include reputational

damage for non-delivery on project objectives and / or poor research quality. In addition, there are real financial risks associated with non-payment. It is advisable to include staged payments in the contract; currency risk; indemnities, warranties and insurance cover; disclosure of confidential information; and premature public disclosure of research outputs resulting in loss of IP rights to one or more collaborating parties.

It is not possible to eliminate all risks associated with a research contract but risk exposure can be minimised in the vast majority of cases, by a few simple steps:
- Clear internal institutional processes for review and sign-off on research contracts
- Availability of appropriate research contract expertise (internal and / or external)
- Clear and simple communication to all stakeholders about terms and conditions
- Appropriate governance / oversight structures and processes to monitor

projects on an on-going basis
- A culture within the institution, supported through on-going training, of good research practice

Audits and reporting

Reporting is an essential part of any research project, covering everything from regular research / scientific reports by the principal investigator (PI), financial expenditure reports at institutional level and large-scale programmatic reports and reports to external funding bodies. HEIs globally are now subject to increasingly rigorous audit requirements, sometimes extending for a considerable period after projects have come to an end. This poses a serious challenge for documentation archiving and retrieval systems within institutions.

Auditing is an evaluation of systems and processes relating to externally funded research projects. Contractual terms and conditions are usually quite specific in requiring the full co-operation of institutions with audits. These audits are carried out to ascertain the validity and reliability of information, to provide an assessment of internal controls within institutions and to ensure institutional compliance with the terms and conditions of the research grant. Auditors may wish to meet with some of the research project staff and may also wish to view HR records to determine whether appropriate recruitment procedures have been followed (see Chapter 6). Audits take an evidence-based approach, seeking official paperwork to support expenditure

and associated activities on each research project. At a minimum an audit is carried out on completion of a research project prior to payment of the final claim, but audits may take place more often depending on the nature of the grant award.

Strategic and Policy Framework

The institutional Strategic Plan, and specifically its research section, provides a detailed roadmap for HEI research priorities and timelines for their implementation. The institutional Research Strategy can be an important support for major research proposals. It is an essential document in terms of planning for research infrastructure and human and physical capacity development. The broader research policy framework that is in place within a HEI provides clear and transparent information to the research community on expectations and processes. In some cases it may be a pre-requisite for external funding agencies that certain policies and processes are in place before they can award research funding. A good example of this is the need for research ethics provisions in the form of an ethics committee and ethics guidelines for researchers.

Some examples of common research policies relate to allegations of research misconduct; conflict of interest; research overhead distribution policy; consultancy policy; research commercialisation and IP Policy; research ethics guidelines on the use of human and animal subjects; and a policy for good research practice, the latter being

concerned with the way in which research is planned and conducted, how results are recorded and reported, and how the fruits of research are disseminated, applied and exploited.

Research integrity: protecting science, society, individuals and HEIs

Research integrity demands that those engaging in research and scholarship should adopt the following basic principles:

- the highest professional and ethical standards in designing and conducting research
- a critical, open-minded approach in conducting research and scholarship and analysing data
- frankness and fairness with regard to the contributions of colleagues, partners, competitors and predecessors
- absolute honesty at all stages in scientific enquiry
- financial integrity in the management of research funds

To retain professional and public trust, it is vital that all researchers accept personal responsibility to uphold these fundamental values.

Increasingly the whole area of research integrity is getting attention in both the academic and general media as a number of high profile cases have highlighted serious cases of research misconduct. The pressure to be seen to perform, in particular for junior staff members, and in some cases to develop credible national and / or international

reputations needs to be balanced at all times with the overarching need for the principles of research integrity to be adhered to. This is essential for both individual members of staff and institutions, both of whom can suffer serious reputational damage if questions are raised concerning research practices.

Conclusion

Research management is an integral component of the governance structure of a modern research-active HEI. It offers institution-wide expertise from a central Research Office to individual members of staff, central support units, centres, schools, finance, and HR, all of which play a role in supporting research excellence and research outputs of socio-economic relevance.

Across national innovation systems and international agencies there are highly competitive processes for awarding research funding, as Chapter 4 of this volume demonstrates. But securing funding is only the start of the work. The institution will be judged on the quality of research outputs and their impact, which ultimately will decide if further funding success is to follow. Even with the best policies, advice and research management support systems, unexpected problems will arise with research projects. Recognise and celebrate success but be prepared for the unexpected by continued development and improvement of research-support and management infrastructures.

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Chapter 4

Research Bid Writing

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Introduction

This chapter provides research managers, administrators, practitioners and researchers with an insight into best practice in preparing proposals for research funding and understanding of the peer review processes that are most commonly employed in reviewing funding applications by many of the major Research Councils and funding agencies. It also offers guidance on how to maximise the chances of success when preparing grant applications. Examples are primarily drawn from the areas of medical research and public health.

Understanding the process and getting started

Whether responding to a commissioned call or initiating a researcher led proposal, it is wise to ensure initially that the research subject or question fits the brief of the intended funder. While the Research Councils will often have specific and relevant information available to help the researcher / applicant in this regard, usually on their websites, the relevant programme manager will usually advise applicants directly when requested to do so and this facility is well worth the time it takes to liaise openly in this way. Programme managers will also be able to guide neophyte applicants through the complexities of electronic submission which is now required by most of the Councils, and advise about the mandatory structure of applications. Often their websites will contain information on the membership of Scientific Advisory Boards. It makes sense for applicants to be acquainted with the research interests of those who may end up reviewing their applications and to be familiar with the scoring criteria that will be used in guiding the subsequent peer review process.

In the initial stages of preparing a funding bid, the applicant should begin to sketch out a project plan for preparing the application, along with a schedule that allows for sufficient slippage to cater for the unexpected. Sometimes deadlines are not negotiable with the funder, but for researcher led proposals a 6-12 month lead-in time is normal for larger programme grants and complex projects. Given the growing emphasis on multidisciplinary collaborations, the timely support of trusted professional colleagues from early in the process is

essential, either to help write the application or to be "critical friends" and proofreaders when a draft has been prepared. Ideally the applicant should enlist the support of at least one colleague from another professional discipline. Applicants should appreciate that while an expert referee's assessment will be sought from someone knowledgeable in the specific field of the application, the proposal must be understandable to a non-specialist also and should therefore minimise incomprehensible terminology and jargon and ensure clarity and coherence. Typically the crucial decisions will be taken at the funder's Scientific Advisory Committee on the recommendation of two reviewers who may or may not be specialists in the applicant's specific field.

One of the most important preliminary sections of the research bid is the abstract. This should distil the essential elements of the research project into short, concise, and clear statements. It will probably guide the assignment of the grant application to a particular section of the review committee and is generally the first portion of the grant that reviewers read. Therefore, it must engage the reviewers' interest immediately and should highlight the nature of the problem, the need for the research, the hypothesis to be tested or the theoretical framework informing the study, the methods to be used, and the significance and unique features of the research.

Developing the proposal

Each funding body has its own terminology and requirements for presenting a research funding proposal and the applicant must be familiar with these. The criteria may sometimes seem deceptively simple, but each one may subsume within it the need to include several other information items and, depending on the nature of the proposal, there may be cross linkages among the stated criteria. The specific emphasis and attention to detail in the proposal will depend on the particular research topic, the funding body and its specific interests and requirements, as well as whether the study is to be conducted within a single discipline or will be multidisciplinary. The level of rigor required by the particular funding body must be the final determinant.

Where a funder provides outline headings in a call for proposals these will be the guide for developing the application. It is also important to demonstrate knowledge of the relevant literature such as books, journal articles and web-sites, and how pre-existing information has been taken into account in developing the proposal. It is especially useful to have access to the criteria by which the proposal will be assessed. Some of these will relate to scientific and / or technical excellence and overall quality of the work programme proposed. Others will focus on other elements such as the methodology and its appropriateness, innovation within the research, the potential impact and use of the research outcomes, the quality of the research partnership, efficiency of the proposed management arrangements, the cost–benefit ratio, and plans for

dissemination of findings. Others may focus on the local, national or international significance of the research, depending on the research topic. The added value of the project for policy and practice and for the integration of knowledge may also be considered.

Ethical issues raised by a proposal are also centrally important. In general terms issues of research ethics relate to the conduct and professional approach of researchers when carrying out research activities. It also involves appropriate management of data handling through the processes of collection, processing, analysis, dissemination and storage. Research ethics require strict adherence to the principles of integrity and good research practice as highlighted in Chapter 3. Most universities are committed to ensuring that all research undertaken by staff or students is conducted to the highest standards of integrity. Normally ethical standards are managed by Ethics Committees within universities. These committees have a duty to consider all possible sources of potential harm that may arise from the research proposed and satisfy themselves that the researcher has planned appropriately for ethical issues prior to granting permission to proceed with a project. Central to this is the need to consider ethical issues involving human participants, human material and data. The researcher is required to ensure that the rights, dignity, safety and well-being of all those involved are protected. Often funders will ask whether research has or will undergo ethical scrutiny

and it is therefore important to examine these issues in advance and to indicate how they will be dealt with. The policy on ethical approval for research at QUB is available at <www.qub.ac.uk/rrs/webpages/ethical_approval_policy.htm> for supplementary information.

Proposal design and justification

Probably the single most important element within any funding proposal is the section on research methods. This will be the focus of most discussion at review and allows reviewers an opportunity to dissect the project rationale and challenge its underlying assumptions as well as the commitment to diligence in implementing the proposed methodology. Research in health and education will necessarily require different methods. However, the crucial characteristics on which a proposal will succeed or fail are the measures taken to protect internal validity (freedom from bias and confounding) and external validity (the potential to generalise the research results). The most appropriate research methodology will depend on the specific questions and hypotheses to be tested and should be informed by suitable pilot studies. Fortunately, researchers now have access to a wide range of consensus statements on what funders and journals expect to see when studies of various kinds are reported and these statements provide valuable checklists for use when describing and justifying research methods. One that has found most traction is the CONSORT statement for randomised controlled trials <www.consort-statement.org/consort-

statement/>. Information Box 4.1 shows the
methods checklist based on the CONSORT
statement.

Information Box 4.1: Methods checklist based on the CONSORT statement

Study sample
- Are inclusion and exclusion criteria fully described and well-justified?
- Are the reasons for selecting this sample clear, not merely convenience?
- Are there important potential biases in the sample selection?
- Are there too many exclusions that are not well justified, or are important exclusions overlooked?
- Are there post enrolment exclusions that could potentially bias the sample?
- Is availability of adequate numbers of participants from the sampling frame assured?
- Are there enough participants in the setting to do this study as described?

Data collection / procedures
- Are procedures well-described?
- Are there quality assurance measures for data collectors?
- Is there adequate description of study instruments and measures?
- Are standardised, validated measures used?
- Are there concerns about validity or reliability of data collection methods?
- Are all important study variables described and collected? Are there extraneous variables that are never used in subsequent analyses?

Outcome
- Is the outcome adequately described, defined, and specified?
- Are the validity, reliability, and performance characteristics of the outcome measure provided?
- Are the outcome data collected by researchers who are blind to the study hypotheses and study group assignment?

Intervention (if applicable)
- Does the intervention appear potent (that is, is it likely to be effective as described)?
- Is the intervention well-described – can you understand what was done?
- Is the protocol standardised so that it is likely to be reproducible in other settings?
- Is the intervention administered by a separate individual or group not involved in outcome assessment?
- Is there blind administration of the intervention protocol (e.g. double-blinding of drug trials)?

- Is there randomisation to study groups? Is there likely to be potential bias in the way the patients / subjects / participants were allocated to treatment groups or received the intervention?
- Will adherence to the intervention be monitored?
- Will the effects of non-adherence be considered?
- Are safety issues regarding the intervention addressed?
- Is an appropriate control group selected?
- Are issues of contamination or co-interventions in the control group addressed?

Consensus statements similar to CONSORT exist for research in other areas. For example, the STARD statement <www.equator-network.org/> is a useful design and reporting guide for those evaluating diagnostic tests while the STROBE <www.strobe-statement.org> and TREND <www.cdc.gov/trendstatement/index.html> instruments provide valuable checklists for observational epidemiology studies. On the other hand, if the purpose of the proposal is to undertake a systematic review and secondary analysis or meta-analysis of the literature, the PRISMA statement <www.prisma-statement.org/> can guide the conduct and reporting of the research.

Recognising the multiple levels at which the determinants of public health operate, the Medical Research Council has produced very helpful guidance for the evaluation of complex interventions, which typically require mixed methods and innovative designs. The most recent edition provides a series of case studies that illustrate, without prescribing, the circumstances suited to particular approaches. Reference is also made to the importance of incorporating appropriate data collection for the subsequent analysis of cost effectiveness. Such a health-economic evaluation is usually a necessity when a proposal for an intervention trial is made to the main Research Councils. Many mainstream health journals have published their own toolkits to guide researchers in this area.

Whereas in clinical research most focus is given to issues related to internal validity, instruments like the RE-AIM framework provide helpful reminders of how the researcher might approach the equally important dimension of external validity, by considering all aspects of the Research, Effectiveness, Acceptability, Implementation and Maintenance of the intervention (Glasgow *et al.*, 1999).

Analysis plans

An analysis plan is constructed around the main aims of the study. If the proposal methodology is quantitative, then it should relate to the main null hypothesis, and more specific advice on this is offered below. If the proposal is for a qualitative study, then the analysis is informed by a designated

theoretical framework and this should be clear from the outset. Increasingly, funders recognise the value of mixed methods so that, for example, the reasons why an intervention worked or did not work can be teased out through an in-depth qualitative investigation with participants.

When the main research question is quantitative, the approach is different. In either observational or intervention studies, it is useful to begin any discussion of statistical power with a consideration of the minimum clinically important difference that one wishes to detect and variation between the groups being compared in the primary outcome variable. This is often informed by "expert judgment", but as a preliminary to a formal power calculation, it is usually expected that the researchers will have obtained information about the distribution and variance of the outcome variable from pilot studies. However, it is never too early to consult with an expert biostatistician when embarking on the power calculation and when thinking through the pitfalls of design, data collection or analysis.

For those without ready access to a biostatistician, resources are available on the web, (see <www.biostat.mc.vanderbilt.edu/wiki/Main/PowerSampleSize> and <www.statpages.org/>). In Ireland, a national service offering statistical and design consultancy to health researchers has recently been launched <www.cstar.ie>. In education and some types of health research, observations are clustered and this lack of

independence and intra-class correlation has to be taken into account, with the anticipated "design effect" inflating the number of subjects required to achieve a given level of power (Adams *et. al.*, 2004). Non experts will also be well served by remembering a number of broad "rules of thumb" when it comes to considerations of statistical power. Many of these have been distilled in readable texts such as van Belle (2002) but a helpful guide for a multivariate analysis is that approximately ten outcome "events" will be required for every co-variate in the model.

The applicant should fully describe the data management and quality assurance procedures in-built within the methodology, such as double entry of data, error and validity checks, and training of staff. Careful consideration needs to be given to how non-response and missing data will be handled in analyses and realistic estimates of attrition should be offered. Laying out the framework for analysis is of paramount importance; there should be a clear specification of the outcome variable and the independent variables and co-variables to be examined in each analysis. It is sensible to say something about the assumptions justifying the chosen approach. Often clarity about the "simple" things like beginning a more complex endeavour with more transparent uni-variate analysis and a preliminary checking of the raw data and the underlying distributions will reassure potential reviewers that the approach has been sensibly thought through. Common critiques by reviewers include inadequate description of the analytic

approach, lack of an intention-to-treat analytic strategy, poor control for potential confounders, insufficient description or handling of missing data, and not enough consideration of attrition. However, caution needs to be exercised in specifying only one statistical approach, since locking into a single statistical method may raise concerns. It may be useful to present justifications for the approach proposed and to discuss some possible alternative strategies. It may also be beneficial to offer to explore some worst case scenarios using a sensitivity analysis if you suspect bias or residual confounding may apply. Without doubt however, the explanatory power of a quantitative analysis will be enhanced if the proposal incorporates a parallel qualitative study (Lewin *et. al.*, 2009).

Quality of the research team and the research environment

The reviewers will evaluate whether there is a clear demonstration of the necessary skill mix, experience, project management and infrastructure to enable successful delivery of the project. If these are not readily available, then appropriate partnerships or collaborations with others who have the required skills or infrastructure must be built in advance. There should be a formal statement of support from any collaborator and it is advantageous to demonstrate that there is also institutional support for the team and its work.

The track record of the applicants will be assessed from their previous publications or grants in the field (see Chapter 3). This is not merely to indicate their status in the field and that the proposal fits well with other relevant research of the group, but to reassure the funders that there is a firm foundation on which to take the work forward. Scrupulous care is required to ensure that any potential areas of overlap with other funded work is fully justified and explained, as well as full clarity as to how the proposed new research is distinct. When assembling the team to undertake the work, the applicants must be careful to follow the funder's guidelines on what can and what cannot be funded in the proposal and while value for money is sought, it is often helpful to indicate some ways in which support in kind can be leveraged by the applicant's own institution.

Dissemination and impact plans

It goes almost without saying that the target audience for the work entailed in the proposal will depend very much on whether it is to be regarded as "basic science" or applied practice-oriented research. Those concerned with basic science may have particular concerns in relation to patent development and they should consult their institutional advisors on IP. But whether in the case of either basic or applied research, its impact will be enhanced by the earliest possible involvement of potential users. While basic scientists seem more wedded to linear notions of knowledge transfer, a more nuanced 'systems' perspective is now favoured by applied health researchers (Ogilvie *et al.*, 2009). Indeed it is now widely held that the translational endeavour will be

more successful if a knowledge
co-production model between researchers
and research users guides research plans.
Thus the greatest traction for changing
practice is possible if there is active
involvement of relevant stakeholders from
the policy and practice community in
both devising the research question and
formulating research plans.

Finally, in terms of dissemination of research
findings, it is standard practice for research
proposals to mention plans for publishing
outputs in peer reviewed academic journals
and planned presentations at international
conferences. Other activities which are
worth considering are the production of a
regular Newsletter or E-zine (for stakeholders
or participants) during the research;
the publication of short policy oriented
papers or briefs for practitioners, spelling
out the implications of the work; and the
organisation of policy oriented seminars
for relevant stakeholders at the completion
of the research. There is now sound and
comprehensive guidance on all such
activities, advocated by the UK Research
Councils, from the INVOLVE organisation
.

Chapter 5

Research Finance

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Introduction

This chapter provides an overview of commonly applied research funding arrangements in the UK HE system, illustrated by the research governance systems in place at Queen's University Belfast (QUB) and to some extent University of Malawi (UNIMA) in Africa. The research grant life cycle is described and details of how research grants and contracts are managed both at the pre-award and post award stages are described. The chapter provides a particular focus as how research grants are costed using the full economic costing (fEC) approach and how costs are translated into the prices charged to particular funders. Finally, the chapter highlights issues of control and management common to systems operated by HEIs whether they are in the UK, Ireland, Europe or Africa.

Research funding arrangements – the UK model

Funding of research in the UK HE system is by way of what is known as the dual support system:

(i)   government funding, known as quality-related (QR) funding, is provided as one leg of the dual support system. QR provides an underpinning research capability for HEIs to:

- provide resources to pursue some 'blue skies' own-funded research
- contribute to the costs of training new researchers
- contribute to the salary related costs of permanent academic researchers where these are not funded from individual grants
- provide resources to contribute to building research capability including support staff, infrastructure and other requisites

(ii) grants for specific projects and programmes provided by, for example, Research Councils, the European Union, charities, and commercial organisations

QR provides, therefore, the base from which permanent academic staff can make credible proposals for research project funding from individual funders. The level of QR funding earned by any particular institution is dependent on the performance of that institution in a national RAE, which is a periodic peer review exercise to evaluate the quality of research at subject level within individual British HEIs. The RAE is subject to change. It will be replaced with the Research Excellence Framework (REF), to be completed in 2014 <www.hefce.ac.uk/research/ref/>.

The last RAE was in 2008 <www.rae.ac.uk/> and each subject within each institution received a profile showing the proportions of research activity in the subject that met defined levels of quality as measured by:

- research outputs (activity, income, publications)
- research environment
- research esteem

The RAE for each institution from which the QR funding is calculated is based on:

(i) volume – the number of research active academic staff whose work is assessed in the exercise

(ii) quality – the quality of the work undertaken and submitted measured as defined in Table 5.1.

Table 5.1: Quality-Related Research Funding

		Funding Weight	QUB % 2009
4*	World leading	9	14
3*	Internationally excellent	3	38
2*	Recognised internationally	1	37
1*	Recognised nationally	0	11
U	Unclassified	0	0

Total research funding available to QUB in 2009-10 was as follows:

Table 5.2: Research Funding at QUB 2009-10

	£m	
QR funding	24.0	
Support for Postgraduate research students	9.7	
Support for charities funded research	3.2	
Total - government	36.9	
Individual research grants	50.9	– of which: Arts, Humanities & Social Sciences 12% Engineering & Physical Sciences 44.8% Medicine, Health & Life Sciences 42.5% Other 0.7%

According to the 2004 UNIMA Strategic Plan <www.unima.mw/downloads/strategicplan.pdf> USD$ 21,899,898 was allocated to research, consultancies and outreach. The current percentage division of the research budget at UNIMA is as follows:

Table 5.3: Research Budget Allocation for UNIMA

	%
Health and Social Sciences	70
Engineering and Basic Sciences	4
Agricultural Sciences	14
Education and Commercial Studies	4
Student and staff-Basic Research	8
Total Research	100

The opportunities and challenges relating to research funding at QUB and UNIMA differ significantly. These differences give rise to substantial variation in the concerns and priorities of these two HEIs.

The primary concerns of QUB are to:
- increase the quality and volume of research active staff
- increase the volume of research grants awarded from peer reviewed sources

- develop research themes – build on existing strengths
- lever additional research grants to increase the ratio of QR / research grants

For UNIMA, the concerns differ significantly:
- it has a small but growing number of experienced researchers
- there is limited institutional / government funding for research
- the underdeveloped grant management systems are a brake on progress
- there is little measurement or assessment of the institutional impact of research

The Research Grant Life Cycle

At QUB research is managed through the work of two offices:

(i) The Research Policy Office which is led by the Director of Research and Enterprise and has responsibilities in the following areas:
- the development of the research strategy
- identifying research strengths at the university and matching these with significant funding opportunities

- research ethics
- encouraging research collaboration, both within the university, and with external institutions
- contractual issues including the production and exploitation of IP

(ii) The Research Support Office (RSO) which is part of the Finance Directorate, and works closely with individual researchers to manage the entire research process from application, to award, to completion. The office was established in 2005 and operates on a team basis to support academics in specific academic areas. The RSO:
- is a one stop shop for research management
- represents a single point of contact for researchers
- ensures all applications are assessed, costed and approved
- maintains a single database of all applications and awards
- increases the efficiency of the process through the centralisation of all administration and financial management
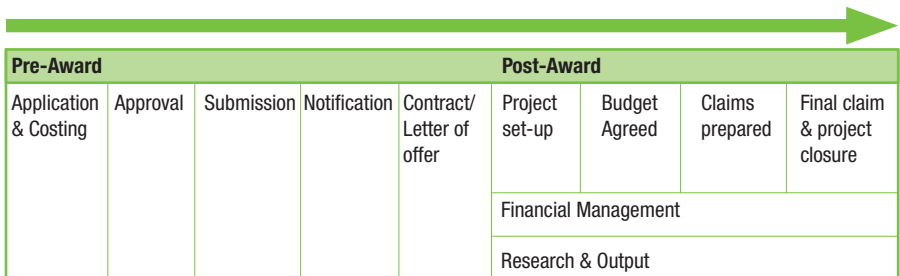
Pre-Award					Post-Award			
Application & Costing	Approval	Submission	Notification	Contract/ Letter of offer	Project set-up	Budget Agreed	Claims prepared	Final claim & project closure
					Financial Management			
					Research & Output			

Figure 5.1: Research Grant Life Cycle

Research grants – pre-award management

It is important in managing the application for any research grant that the respective roles and responsibilities of the individual academic / PI and the research support officer are clearly defined. In QUB a Research Grant Application Summary Form (RGAS) is completed for each research grant application and this form contains the following information:

- details of the project including sponsoring body, project title, estimated start date and duration
- the support of the Director of Research for the particular research centre
- details of the PI and co-investigators (CIs) including the estimated time commitment from each
- financial details
- confirmation that research governance and ethics have been signed off
- verification of the sign off of the application by the RSO

The PIs maintain overall responsibility for the preparation of the proposal given that they will write the academic content and be familiar with the particular sponsor and call criteria. They will discuss and agree the ethics and governance arrangements and, together with the RSO, ensure that the project is accurately costed. The RSO will provide advice and assistance with all financial aspects and, in particular, the project costing. They will ensure that all controls and authorisations are applied, that the RGAS form is completed and approved,

and that the application is submitted to the sponsor on time. The application database will be updated accordingly. An example of some of the administrative and control issues which can emerge at pre-award and post award stage is included in Appendix 5.1 of this volume.

Research grants – costing and pricing

In the late 1990s it was recognised within the UK HE Sector that, as the volume of research had increased, a low price culture had developed in which HEIs were failing to recover the full costs of the research undertaken. Research was, therefore, being cross-subsidised from other sources of income and there had been inadequate investment in infrastructure. As a result, the future sustainability of the research base was at risk. In order to address these problems, a number of measures were introduced by government including:

- greater clarity in the purpose and scope of QR
- the introduction of a common costing system (Transparent Approach to Costing – TRAC)
- the adoption of fEC for research grant proposals
- clarity as to the costing and pricing of research undertaken for charities, government dependants, commercial services and research councils (RCUK)

TRAC is a common costing system first introduced in 1998 which analyses the cost of an HEI into 5 main categories. These are

(i) teaching publicly funded; (ii) teaching non-publicly funded; (iii) research publicly funded; (iv) research non-publicly funded; and (v) other. Following publication of the report *Government Strategy for Science, Engineering and Technology: Investing in Innovation* in July 2002, additional funding was made available by government to RCUK to allow for payment for research based on a fEC model. Within TRAC, and to calculate the full economic cost of an individual research project, costs are categorised as follows:

(i)   directly incurred costs – new discrete, additional costs that are dedicated to the specific project including any new staff, consumables, travel, equipment

(ii) directly allocated costs – existing costs attributed to the project based on established usage, such as academic staff time, usage of major research facilities, staff allocated from central pools, for example technicians, clerical and administrative staff

(iii) estates costs – building and premises costs, basic services and utilities, rent and rates of property, insurance, cleaning, porter services and security. Costs are allocated based on the most appropriate cost driver, for example space used, staff numbers, student numbers

(iv) indirect costs – general office and basic laboratory consumables not directly incurred, library services, finance and other central administrative costs

The fEC also includes two cost adjustments to reflect the consumption of assets used in research projects and the cost of capital employed. These adjustments (infrastructure and return on financing and investment) add approximately 6% to overall costs. The fEC, therefore, represents the full cost of undertaking the research to the HEI. Pricing of research projects also takes into account whether the funder of a research project is a sponsor or end user of the research base financed through QR funding streams. For example, organisations such as the European Commission (EC), certain commercial sources and government departments are primarily users of research and therefore should fund research to at least 100% of cost. On the other hand, Research Councils and the National Health Service (NHS) are funders of the research base and therefore fund research projects to 80% of fEC. In the case of charities, the goal of research undertaken is generally to generate knowledge that will benefit the public. The government in the UK has, therefore, provided additional funding to supplement QR and, as a result, charities are not expected to pay the full economic cost of work undertaken. An example of an exercise to demonstrate the outworking of fEC is attached as Appendix 5.2 of this volume.

Research grants – post-award management

When a research award is approved the HEI will receive a contract and a letter of offer from the funder – see Information Box 5.1. It is important that the contract is examined and that all conditions are accepted and understood by the PI and the RSO before it is officially agreed with the funder.

Information Box 5.1: Basic information in a typical contract and letter of offer

- The PI and any co-investigator (CI)
- The period of the research grant
- The project budget
- The agreed start and end dates
- Reporting arrangements -
  - Scientific reports
  - Claims and financial reporting arrangements

When a project is accepted a number of actions should follow:

(i) the research project is allocated a project code and is set up in the University financial system

(ii) a start certificate is completed

(iii) the project budget is established

(iv) an authorised signatory form is completed defining who can initiate expenditure on the project. This includes the use of the electronic post approval system to authorise the apportionment of any new staff

(v) staff can be recruited only if and when an electronic post approval form is completed

Good communication is very important in ensuring the smooth running of a research project. At the outset, and following acceptance of the contract and letter of offer, the RSO agrees arrangements with the PI and:

- provides a project code
- agrees budget and start / end dates
- asks PI to complete a start certificate
- ensures that the authorised signatory form is completed

- provides a step by step guide to the QUB online budget reporting system

In reality most research grants are funded at levels less than the full economic cost. Universities in the UK continue to lobby funders through the Research Funders Forum to secure close to 100% of fEC from all funders other than RCUK, NHS and charities. The funding arrangements with the European Union are particularly complex.

When the project budget is determined, the first priority will be to meet directly incurred costs. The balance of funding is then available to meet indirect costs and overheads. The agreed budget and the apportionment of costs is signed by the PI and the Head of the Academic School prior to input into the university's financial system. Actual expenditure is, therefore, monitored against the agreed budget. Key controls in the management of any research project include:

(i) an electronic post approval form which facilitates the request, checking and approval of new staff funded directly through the research grant

(ii) specification of authorised signatories with authority to initiate and approve expenditure on any grant. The initiation of expenditure is separate from the actual processing of any order or payment, thus increasing the level of internal control. The authorised signatories must be agreed with the Head of School

(iii) a start certificate that specifies an agreed start date and duration of the project and may also specify the expected profile of the expenditure over the period of the grant. The start certificate must be completed by the PI, signed by the Head of School and returned to the RSO

Report management for research grants

Management and financial reports are available at various levels to inform the overall management of research grants. Individual management reports setting out the project budget and expenditure to date are available in real time and on-line to all PIs. Summary reports are available listing all grants awarded to a particular School and summarising the position on each grant. These reports can be analysed by individual PIs by period, by research cluster and so on. The reports to the Head of School not only provide summary information to track the ongoing progress of any project, but also enable the Head of School to assess those staff who are research active and monitor research income per staff member. Quarterly reports, together with a commentary, are provided in addition to details of the operational management of the grants.

These enable the Head of School to assess if income received is sufficient to meet the full costs of the work undertaken.

Summary reports showing the position across all Schools / academic areas are available to Deans, the Research Committee and the University Management Board. The latter board, as an integral part of the Institutional Research Strategy and the Academic and Financial Plan, has established targets for each School to increase total research income and to maximise the contribution from this income to meet indirect and overhead costs. It is, therefore, important that summary reports are available at institutional level to monitor progress against these targets on a quarterly basis.

In addition to the financial reports available, and in preparation for the next RAE (now the REF), QUB is also closely monitoring the activity of research active staff to ensure that quality outputs are being produced and that all staff are contributing to the research priorities of the institution.

Conclusion

The importance of research in sustaining and developing the economic activity of any region, and in improving the health and well being of its citizens, cannot be under-estimated. Increasingly research funders are seeking to measure the economic impact of research. For their part, universities and research centres are increasingly putting mechanisms in place to exploit research

knowledge, ensure the IP is protected, maximise income from licensing and, where relevant, promote spin-out companies. They are also striving to increase research activity and to ensure that the teaching of undergraduates and postgraduates is informed and underpinned by an excellent research base.

As in all activities, the maintenance of sound procedures and processes and a high level of financial control and corporate governance are vital. This not only ensures the continued confidence of funders but also ensures that funds provided are used efficiently and effectively in the pursuit of agreed objectives. For example, arrangements at QUB allow academics to concentrate on developing their research, while staff in the RSO deal with the ongoing day to day administrative processes.

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Chapter 6

Human Resource Management

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Introduction

The success of any organisation relies on the capability of the people within it, and in particular their commitment to achieving organisational goals. Structures to facilitate the effective management and utilisation of organisational resources are required, and central to that is the effective deployment and management of people. This chapter provides an overview of a number of the key elements to be considered in Human Resource (HR) Management. It is not possible or intended to cover all elements of effective staff management here. The intention is to challenge readers' thinking on some of the key elements and models informing teamwork, leadership and the key HR processes of recruitment and performance management, as these are core processes in successful organisations.

The skills of people management place demands and challenges on research leaders that require deliberate strategies for success. It is accepted that research centres and equivalent structures have specific needs and requirements. They tend to be formed quickly in response to funding opportunities or research schemes. They are continuously seeking fresh opportunities to adapt and innovate to generate additional research and funding that allows them to survive and grow. In this uncertain environment, key elements of the HR process become more critical and need to be more acutely managed to suit the specific needs of a fast moving, ever changing environment. This chapter covers areas that are particularly significant for effective HR management in that context. In particular the chapter focuses on the recruitment of staff; performance management; leader / supervisor effectiveness; and the development of team dynamics.

Organisational context

Under the traditional form of personnel management the responsibility for people was seen as the domain of the Personnel Department, but over the last 20 years as the function has been rebranded to HR, so too have we seen the primary responsibility for staff members shifting towards line managers. As a consequence the role of the line manager has been evolving and today's manager requires a diverse and complex range of skills to be effective. While individual staff members are key stakeholders in their own deployment, management and development, the primary responsibility for managing performance and development of staff should rest with the line manager. Increasingly the HR function is to support

and guide the management process and to provide direction and support through policy and procedures geared towards enabling the overall organisation and through advice, guidance and input more locally where required.

Organisations exist to achieve results, but do so often with limited resources, particularly people. How the people are managed is what really makes the difference. Managing people is primarily about the development of effective relationships that deliver results. Therefore how we utilise our collective capability or 'organisational capability' will ultimately determine our results. Competitiveness in organisations can be achieved in a variety of ways. However, sooner or later costings, technology, distribution, manufacturing and product features can be copied. While these are essential they do not guarantee success. Conversely, it is difficult to replicate the capability and commitment of people. Capability must be selectively chosen, carefully developed and appropriately harnessed (Information Box 6.1). Commitment must be encouraged,

rewarded and cherished through the creation of an environment necessary for this to occur. Consistent development of capability and commitment involves putting people to the forefront, focusing on having the right people, with the right skills, in the right place, with the right mindset and at the right time.

Through this chapter and its associated Workshop Module (see Chapter 9 and CD) the HR functions relating to (i) recruitment- how do you ensure that you attract and select the right people; and (ii) performance management – how to manage development of people and that of the team to ensure effective / superior performance and satisfaction – will be examined in detail.

Recruitment

Recruitment in a research environment poses different challenges to those generally faced within HEIs. The processes and the procedures for recruitment of staff in HEIs are usually well defined and aligned to best practice, and there is a proven track record of consistency, fairness and transparency. However in a research context there is an additional need for responsiveness and

Information Box 6.1: Good practice in staff selection and management

- Right People   =   Recruitment and talent management
- Right Skill   =   Development
- Right Place   =   Performance Management
- Right Mindset   =   Organisational Culture and Career management
- Right Time / Planning   =   Succession / HR

speed of turnaround which challenges the standard processes that may, for example, be applied in recruiting lecturers. Research entities need to move quickly once funding has been approved, the upside of which is speed and flexibility. The downside is the possibility that the best people may not be recruited for time reasons, and this can constitute a poor starting point for success. This makes pre-recruitment planning, the assessment / interviewing process and post assessment areas particularly important when recruiting research staff.

Pre Planning
Regardless of limited time, the first key element in filling research positions is the planning and preparation around staffing of the research unit / centre. Staffing decisions should be driven by consideration of the following issues:
- What is the strategy of the team?
Is there a clear strategy that can guide the decision around the skill sets required? What skills are present in the team and what skills are required / deficient? If there are skills deficient in the team how will these be minimised / eliminated?
- Is the post necessary?
Is the position necessary or could it be resourced differently? Is there a budget for the position and for recruitment costs? What value will be created by the position – will it focus on achieving additional funding or on problem resolution or on generating additional efficiency / savings? How does the ongoing cost of the position (salary plus all other costs) relate to the savings or revenue that will be created by it?
- Is the position well defined?
What is the scope of the work to be done? What are the key skills, knowledge and experience required – now and in the future?
- What type of person is required?
What personal traits and style are required? What wider team and networking competencies are required in the person? What role is expected of the person within the team and how is that envisioned?
- What is the best means to fill the gap identified?
Is recruitment or outsourcing the best option? Can reassignment within existing resources be utilised? What methods are to be used to attract and recruit suitable candidates? Is there a budget and how will that be utilised? How are advertising media to be used to target the right people? How are the right people to be attracted and encouraged to apply for the position?

Assessment of candidates
In order to conduct an assessment of candidates it is necessary to establish an interview panel or board. The decision regarding composition of this is usually guided by the policy in place in the institution. In the absence of a policy, a general guideline is to ensure that at least two people conduct interviews and there is an adequate balance for gender. It is also important to ensure that the board comprises the manager likely to supervise the position, an academic / professional / technical representative and a HR professional.

A short-listing process is required to determine the eligibility of candidates based on the written / published criteria for the post, and this process will identify those to be interviewed. It is important to arrange a suitable interview schedule that allows adequate time for set up, interview and post interview assessment. A good benchmark is to allow up to one hour for an interview with fifteen minutes before and after for preparation and discussion. Best practice suggests that not more than between six and eight interviews are conducted in any given day, on the basis that effective interviewing requires considerable concentration on the part of the interviewer. The interview board should spend time talking through the required style and format of the interview and allocate different responsibilities to the various board members. This should include consideration of questioning techniques and key areas that need to be assessed in line with the job description. Procedures should ensure that the key criteria for the position get primacy in the assessment process.

The Interview
The interview is a process of exploration for interviewers and interviewees. It is first and foremost about ensuring that the right person is selected for the job, but it also affords the organisation an opportunity to market or sell the post to the candidate. When selling the organisation and the position, it is important to tell it as it really is, because the implications of painting an unrealistic picture can be costly. A candidate must know what they can realistically expect so

that they make an informed decision. For maximum mutual benefit both parties must be in agreement, so the interview is also a form of negotiation between the parties. It is important to deal effectively with any queries that the candidate may have because they will continue to analyse the opportunity until they accept a job offer.

Often not enough time is spent on ensuring that a candidate who has the right skills and experience actually is right for the job in all respects. It is important for both parties to be confident that the candidate is compatible with the culture of the organisation and a good fit for the team. Time should be dedicated to confirming this by assessing how candidates felt about other organisations and other teams that they have worked within, and by exploring the ways in which they worked in teams in the past, the difficulties they encountered and how they managed their way through those difficulties. It is useful to put hypothetical scenarios to them about problems they may encounter in the new post and to check how they would deal with difficult people and manage difficult relationships with a manager or team member. The interview board must try to understand how candidates would interact with other team members who might be outside their control, and should discuss the atmosphere in the organisation and the team and gauge reactions. It should also explore any similar experiences they have gone through and their impressions, beliefs and attitudes to work. Information Box 6.2 contains a checklist of additional

Information Box 6.2: Good practice in interviewing techniques

Questions:
- Open - exploring – require an explanation through the use of why... how... tell me...
- Closed - probing – looking for confirmation – when did you...
- Yes / no – checking - did you complete.....
- Leading - guiding – you say you ......
- Multiple - confusing – more than one question asked at the same time.
- Discriminatory – asking for information irrelevant to the interview and covered under legislation. Interviewers should desist from asking these types of questions
- Combination – a series of questions that lead the candidate into a point that you need clarified – See across

Question combination pattern for behaviour-based interviewing:
- Tell me about yourself......
- Why did you do that......
- Was it the right thing to do.......
- How did you feel......
- What did you learn.......
- What would you do differently.......
- How did other team members react to that....

Other considerations:
- Active listening – demonstrating to the candidate by sound, eye contact and affirmation that you are listening and interested
- Do not take your preconceptions into the interview and be patient to get a full picture
- Jumping to conclusions is an obvious obstacle to effective interviewing – be patient
- Reading between the lines – check back if uncertain about things you perceive
- Body Language – Experience in body language interpretation can assist the interviewer with the exploration of difficult areas, tell more about the candidate's disposition and give you a fuller picture of the person.
- Summary and checking – use summary to feedback what the candidate has said, for confirmation of facts and to clarify any doubts in interpretation
- Documentation and records – ensure you take good notes for reference. In some countries this is required by law

considerations and questioning techniques for easy reference.

Post-assessment follow up

A candidate is not an employee until they commence employment. It is essential that the period between interview / acceptance of the job offer and the actual start date is carefully planned. All pre-employment documentation and processes such as medical examinations need to be professionally completed, with ongoing contact maintained. This provides an opportunity for the person to familiarise with the manager, the organisation and the new role. It is wise to have the appointee visit the campus, meet team members and view facilities so that they start to get a mental image of working in the new environment in preparation for employment. Time spent here is a good investment, as it allows the appointee to arrive prepared or to 'hit the ground running'. It is also useful to have the appointee involved in the planning of their induction and it is important that the induction programme is well managed and monitored, as first impressions can be important. All stakeholders need to be informed about the new appointment and provided with the maximum possible information about their new colleague.

Performance management

Traditional performance appraisal is the annual formal recorded 'conversation' between an employee and a manager. The culture of the organisation generally determines how the process is perceived and managed. In some organisations it is seen as a bureaucratic form-filling exercise, in others it as a confrontational 'measurement' exercise, while others see it as a valuable element in the overall direction and development of the organisation and a key statement of commitment to its people, their utilisation and their continued development. In most of the organisations that value the process, the traditional appraisal has evolved into an integrated performance management system, where the individual's development and performance is clearly aligned to the organisation's goals and objectives. It provides an opportunity for clarity of purpose and direction and ensures that all aspects of the employee's career development and future are central to the organisation's plans and talent management programmes. Performance management is a key element in ensuring that resources are aligned, effectively managed and key employees are retained and continue to be motivated.

Figure 6.1 illustrates the cyclical and ongoing nature of the performance management process. It also shows the various stages that a leader needs to proactively manage to ensure that performance management is central and effective, forming an integrated process that embodies goal setting, performance review, employee development and career planning. The culture of the organisation is the 'foundation' for performance management, and organisations can develop a 'performance culture'. Normally performance management is ongoing throughout the year. The manager

and the employee set the targets and plans at the commencement of the year and regularly review progress and requirements to ensure that continued alignment and clarity exists. The process also embodies the training and development plans necessary to achieve goals and facilitates the shaping of the long term objectives of the organisation and the career aspirations of the individual. See Information Box 6.3 for other relevant considerations that may be taken into account.
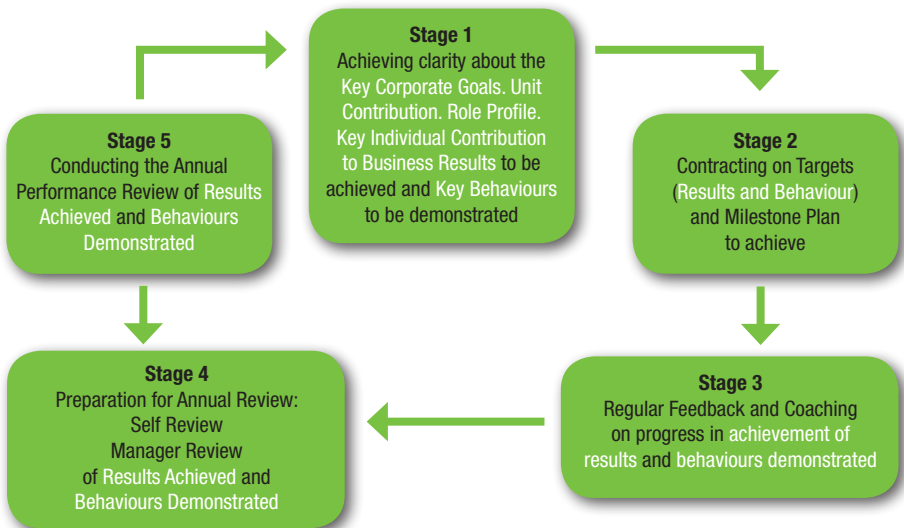

Stage 1
Achieving clarity about the Key Corporate Goals. Unit Contribution. Role Profile. Key Individual Contribution to Business Results to be achieved and Key Behaviours to be demonstrated

Stage 2
Contracting on Targets (Results and Behaviour) and Milestone Plan to achieve

Stage 3
Regular Feedback and Coaching on progress in achievement of results and behaviours demonstrated

Stage 4
Preparation for Annual Review: Self Review Manager Review of Results Achieved and Behaviours Demonstrated

Stage 5
Conducting the Annual Performance Review of Results Achieved and Behaviours Demonstrated

Figure 6.1: The Cyclical Nature of the Performance Management Process

Leadership

The model created by Goleman *et al.* (2002) describes six styles of leadership, including visionary, coaching, affiliative, democratic, pace-setting and commanding leadership.

The Visionary Leader moves people towards a shared vision, telling them where to go but not how to get there. They openly share information, hence giving knowledge and power to others. This style is suitable when a new direction is needed. Overall, it has a very strong impact on the workplace climate. The Coaching Leader connects the wishes of staff to organisational goals, holding long conversations that reach beyond the workplace, helping people find strengths and weaknesses and tying these to career

Information Box 6.3: Creating and sustaining the right performance management culture

- Spend the time to recruit the right team
- Inspire people with a clear vision, a challenging strategy and key values to guide team behaviour – 'sell the story'
- Consistent and regular communication is essential to continued motivation and alignment
- Create a team balance and a challenging but supportive business environment
- Give people the scope and freedom to experiment and to fail – tolerate mistakes but learn from them
- Delegate responsibility – give people the autonomy and accountability – let them make decisions
- Mentor and coach – guide rather than direct people
- Manage performance through regular review and discussion
- Celebrate and reward success
- Tie people in – ensure you have appropriate remuneration packages
- Spend time to ensure that people know about the business – share the financials, performance and priorities and plans
- Provide a challenging and evolving environment – create the opportunities for people and encourage growth and development
- Make people feel valued
- Provide freedom and clarity for people to allow them to get on with their research and to express themselves
- Provide positive tension – healthy competition among team members and across teams
- Support and shield the team – the leader needs to champion and promote the team across the wider organisation
- Spend time to assess the talent in the team, develop potential and recognise achievement
- Manage performance and in particular the non performer
- Ensure that there is clarity of expectations and that what is promised can be delivered
- Provide regular and ongoing assessment
- Feedback needs to be direct and honest – there is no room for mixed messages

aspirations and actions. It is best used when individuals need to build long-term capabilities. It has a highly positive impact in the workplace.

The Affiliative Leader connects people and thus creates harmony within the organisation. It is a collaborative style that focuses on emotional needs over work needs. It is best used for healing rifts and getting through stressful situations. It has a positive impact on the workplace and interpersonal relationships.

The Democratic Leader signals the value of staff inputs and commitment through direct participation, and listening to both the bad and the good feedback. It is most effective in gaining staff buy-in to an initiative or when simple inputs are needed. It positively impacts the work environment.

The Pace-setting Leader builds challenging and exciting goals, expecting excellence and exemplifying it themselves. They identify poor performers and demand more of them. If necessary, they will roll up their sleeves and rescue the situation themselves. It is best used for results from a motivated and competent team. It often has a negative effect on the work climate when it is inappropriately used.

The Commanding Leader soothes fears and gives clear directions by taking a firm stance, commanding and expecting compliance, but not necessarily agreement. This approach is best operated in times of crisis for unquestioned rapid action and with problematic colleagues who do not respond to other methods.

All six are styles, rather than types. A leader can use any style, and a mix of styles that is customised to the workplace is generally the most effective approach. Leaders should evaluate the different possible styles that reflect their own experiences and determine which style combination best fits their day to day management situation. Through reflection on their career experiences leaders should determine what styles are likely to be most effective in their current and future activities, and from that a strategy for leadership can be developed. It is also useful to reflect on the leadership styles of other managers and through that to determine what works where, with a view to modelling the best leadership style.

Teams and teamwork

The model of group development proposed by Tuckman (1965) from his research into group dynamics informs the discussion of teamwork. This illustrates the phases that a team naturally goes through as it develops and pursues its business. It shows that these phases are inevitable and indeed necessary for teams if they are to successfully face the challenges of growth and adversity to deliver positive results. The four phases that a team goes through are forming, storming, norming and performing. Readers are invited to reflect on their experiences of a team that they have worked with in the context of these phases, including the leader of that team. It is useful to use personal experiences as a touchstone for how teams and individuals cope with and manage the phases of growth. It is also

beneficial to overlay the model of leadership described above to ascertain the appropriate leadership style for the various phases.

Forming is the first stage of team building. Each individual wants to be accepted by the others. People become familiar with each other and generally avoid controversy or conflict focussing instead on the structure and activities of the team. The team establishes the behaviour norms that will operate and defines its purpose as it starts to develop its own strategy. The team or its leader will begin to define the structure required in the team. This will include team composition, which will result in some recruitment and selection activity. The team leader will also establish and assign the goals and objectives required to achieve the strategy and allocate tasks and roles accordingly. Mature team members or the leader will also start to model behaviour so that the team will function accordingly.

Storming occurs where different ideas in the team start to compete with each other. Members are familiar with each other and will more clearly define their roles and responsibilities within the team as they open up to each other and confront each other's ideas and opinions. There is generally high energy, focus, tension and innovation at play. However this phase can be destructive if not controlled and channelled effectively. Some teams never develop past this stage and this is a challenge that the leader needs to manage discreetly and sensitively.

Norming is where team members grow to respect each other's contribution and capability. The team's goals are increasingly aligned and clearly focussed on achievement. Decision making processes are known and the team strategy is clear. All team members take responsibility and have the ambition to work for the goals of the team. There is the possibility that a team could revert to storming if the relationships within the team are not effectively managed and nurtured.

Finally, it is possible for some teams to reach the performing stage. These high-performing teams are able to function as a unit as they find ways to get the job done smoothly and effectively without inappropriate conflict or the need for external supervision. Team members have become interdependent. By this time they are motivated and knowledgeable. The team members are competent, autonomous and able to handle decision-making processes without supervision. A rigorous performance management culture and process are in place. Dissent is expected and allowed as long as it is channelled through means acceptable to the team.

Chapter 7

Graduate Schools, Graduate Supervision and Structured PhD Programmes

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Introduction
Master's and Doctoral degrees are among
the most advanced and specialised forms
of education available in contemporary
society. Their primary purpose is to produce
graduates that can serve society at large
with the capacity to carry out high quality
research. Highly-qualified graduates at
Master's and PhD level enter their chosen
careers equipped with advanced knowledge
and skills acquired through their research
programmes. This chapter is directed
at personnel whose task is to improve
graduate research and education in HEIs
generally or at the discipline specific level.
It also constitutes a general guide to the
development of supports for the process
of graduate research supervision. The
approaches described and reviewed here
have been found successful in enhancing
capacity within HEIs for the recruitment
and management of graduate scholars. In
particular this allows for increased graduate
student numbers, superior quality of
graduates, better support and more efficient
management of research students, and
improvements in the delivery of research-
based graduate programmes.

Establishing a graduate strategy
The Organisation for Economic Cooperation
and Development (OECD) produces a ranking
of countries on the basis of the numbers
of qualified researchers they produce. For
appropriate national performance in this
area it is necessary to align HEI strategies
for graduate research with national
objectives which seek to increase national
rankings in the global context. In national
terms, therefore, there is a need to build
up structures that facilitate producing the
maximum number and quality of graduates
educated to PhD level (4th level). These
graduates facilitate participation of their
countries in the global knowledge society
and knowledge-based economy. It can be
argued that reliance on international aid,
foreign-owned high-tech manufacturing and
traditional industries and services such as
agri-food industries must be supplemented
in the future by indigenous enterprise growth
and facilities for international centres for
research and development. Equally, building
research capacity can arguably alleviate
poverty in the development context. For these
reasons *pro rata* global rankings based on
Master's and PhD graduate numbers are
significant and strategies for advancing
graduate education at 4th level are essential
to national development.

In developing graduate research strategies several essential elements are required. First, quantifiable targets should be established for numbers of research students and time-lines by which those numbers will be achieved. This may, for example, be expressed as targeting an increase in the numbers of PhD graduates from 100 in 2010 to 150 in 2015. These targets should also incorporate specific objectives for improving completion rates, so that, for example, an objective of the strategy would state that by 2014 80% of doctoral students will have completed their programme within four years of registration. Second, structured doctoral programmes should be provided and these need to include generic skills, professional skills, subject specific and advanced specialist modules that support the research component of the doctoral degree. Third, inter-institutional collaboration for the delivery of research programmes should be leveraged at the level of module delivery, ICT enhanced learning and staff exchanges. Such collaboration has the potential to create cost-effective high quality graduate programmes. Fourth, formal support and up-skilling for academic supervisors and academic staff generally is essential in developing supervisory capacity within HEIs. This must also include incentives and rewards for staff. Finally, each HEI must establish infrastructural supports, policies and quality standards for research training, including benchmarking with recognised graduate schools, as a way of setting standards against recognised international best practice. At the level of the individual

HEI, establishing a coherent institutional graduate strategy is a first step towards putting the arrangements described into operation. The Graduate Strategy and Policy Document for NUI Maynooth is a useful example in this regard (NUI Maynooth, 2009).

Graduate schools and governance

Implementation of a graduate strategy within a HEI requires appropriate governance structures. In recent times HEIs in Ireland have taken the view that the development of inter-institutional and national graduate schools is a pre-requisite for producing high quality PhD graduates in sufficient numbers to achieve a critical mass of research expertise nationally. Mindful of economies of scale, organisational efficiency and effectiveness, the current consensus on the way forward is to establish graduate schools that offer different subject specific and / or interdisciplinary themed research programmes. These graduate school structures are normally overseen by a senior officer with responsibility for graduate research programmes, and are firmly embedded in existing HEI governance. They are supported by officers with clear role descriptions and by well documented procedures, policies, regulations and guidelines. They often involve inter-institutional partnerships and stakeholders, as well as policy driven organisations in industry, civil society and government. It is also considered useful if representatives from existing committees, such as teaching and learning, research,

commercialisation, knowledge transfer, Governing Body, student representative body, and external stakeholders such as industry have membership of the graduate school committees. Graduate schools are regularly assessed on the quality of their PhD education and supervision. Quality criteria normally ascertain the details of research output, student experience, completion rates and time taken for completion.

Recruitment and selection to graduate schools

Graduate school documentation must ensure that information on undertaking a research degree programme, on the challenges of research, on possible career paths and other areas of relevance is communicated

to all applicants. Documentation on the requirements for registration, descriptions of research programmes, processes for progression and possible outcomes at each progress point should be available both on-line and in hard copy and presented to candidates during the application process. Suggestions for the content of a postgraduate researchers' handbook is provided in Information Box 7.1.

Recruitment and admission of graduate research students need to be dealt with individually, as candidates will have individual supervisory panels, specific research projects and individual programmes of study. Interviewing candidates is cost-effective if time-consuming and is considered highly

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Information Box 7.1: Suggested content for handbooks for research postgraduate students

- The obligations and rights of all parties in the graduate programmes
- Student and supervisor roles and duties
- Fees and costs
- Examination processes
- Library, computing, technical and laboratory facilities available
- Biographies of staff, their research interests, publications and successful grants
- Biographies of successful graduates and possible career paths
- Timing and mode of presentation of modules, reports, reviews, seminars and examinations by which the student is assessed and progressed
- Requirements regarding work in departmental teaching, tutorials and demonstration to be undertaken by graduate students
- Available guidelines on good research practice, ethics and misconduct
- Procedures for appeals and conflict resolution
- Policy on interlibrary loan costs
- Regulations for thesis content, standards and intellectual property
- Specifications for publishing papers

advisable. Efficient recruitment occurs where detailed information, such as described above, is readily accessible to potential applicants. In addition, where site visits are facilitated this allows applicants to be fully informed in advance of any commitment to register. Procedures for communication of reasons for non-admission to unsuccessful candidates should be provided in writing, with reference to admissions regulations and procedures.

A high standard of performance in pre-doctoral courses is an essential requirement for potential doctoral candidates. This may be achieved by candidates through taught Master's Degree programmes, research Master's Degree programmes, or specific pre-doctoral programmes. The selection process for students at doctoral level must establish that the intending PhD student has sufficient knowledge and expertise in theory and conceptual frameworks, how to define a research question, qualitative and quantitative methods or hard sciences research methods, evaluation of research designs and research proposal writing, generation and analysis of data and the dissemination, composition and defence of research outcomes. The evidence that comes from pre-doctoral preparation is vital determining suitably qualified students so that acceptable levels of progression and completion by its graduates can be achieved. Deficiencies in these pre-requisite skills may exclude a candidate, unless generic skills modules are available in the PhD programme.

Finally, the research proposal is the single most important component of the selection process that forms the basis on which a PhD programme place may be offered to a graduate candidate. A rigorous evaluation of the research proposal by the supervisory panel should form part of the selection process. Attention should be paid to the quality of the writing, the definition of the research question, the literature review, the conceptual framework, the methodology and experimental design, the feasibility plan and the fit between the supervisor's research specialisation and the interests of the graduate candidate.

Supervision in graduate schools

The supervision of research graduate students is a collective responsibility. The student, the supervisor, the supervisory panel, and the graduate school are equally essential partners in the supervision process. Effective PhD student supervision is based on the research expertise and active scholarship of the supervisor, but supervisor training and support, and graduate school standards and procedures are also necessary components of successful supervision.

The graduate school should have published defined criteria on the eligibility of staff to act as supervisors. It should also have defined fields of interest among its staff complement towards which potential students may be directed. The principal research supervisor should be an active scholar in the field in which the PhD student is pursuing their specific research topic.

Graduate schools should provide tuition and up-skilling for supervisors, including supports such as appropriate teaching and learning resources, coaching modules, on-line or local short courses and accredited supervisory training. Schools should provide occasional shared reviews of supervisor experience and back-up in problem solving for supervisors with input from experienced colleagues. New supervisors should attend obligatory up-skilling courses and work alongside an experienced supervisor before becoming a principal supervisor.

Graduate schools need to establish set procedures that ensure that adequate levels of supervision are maintained, such as arrangements for the range, frequency and duration of contact between students and supervisors and the support for students when the principal supervisor is absent for significant periods of time or on sabbatical leave. Supervisory panels must support the supervision process to ensure high standards and contribute to reviews and decision making regarding progression. The graduate school requires formal published descriptions of the responsibilities of the supervisor, student, panel and school in relation to supervision, and formal published accounts of the rights and entitlements of all parties in the supervisory process, along with a formal procedure that facilitates change of supervision where required. Realistic workloads for staff and research students should be set out in graduate schools' regulations, defining the maximum student to supervisor ratios by discipline. Evaluation

of supervisory performance should take into account completion ratios and durations, resources available to the supervisor and student, and the nature and composition of the supervisory panel and the broader research group within the department or school. Staff promotion procedures should reward high levels of performance in the supervision of graduate research students.

Structured programme provision

Arising from the key principles that emerged from the Bologna Seminar on Doctoral Programmes for the European Knowledge Society in 2005, structured PhD programmes are considered to have the potential to increase the numbers and the quality of PhD graduates (European University Association, 2005). The traditional model of graduate education by research and thesis is for students to conduct original research work using a rigorous methodology and in-depth critical analysis under the guidance of an academic supervisor within an apprenticeship model. Structured programmes offer an alternative model, introducing formal taught elements on professional skills, subject specific skills and advanced specialist skills, and often include formalised links to external stakeholder organisations, as well as a research thesis. Structured programmes recognise that PhD graduates are sometimes destined for careers outside academia, and this is taken into account in the design of the structured programme. Key elements within a structured doctorate are shown in Information Box 7.2.

Information Box 7.2: Key elements within a structured doctorate programme

- Advancing knowledge through original research
- Meeting the needs of an employment market that is wider than academia
- High quality research experience and education consistent with international norms and best practice
- Supervision by a principal supervisor with a supporting supervisory panel
- Discipline-specific knowledge, research skills and generic / transferable skills
- Appropriate placements, rotations and assignments
- Integrated personal and professional development activities
- Student progress monitored against published criteria and supported by formal institutional arrangements
- Outcomes and attributes for graduates that correspond with national and international best practice

Structured PhD programmes are in line with international developments and new thinking that shapes doctoral education worldwide. An example of this is the work of the Centre for Innovation and Research in Graduate Education (CIRGE) at the University of Washington, which in collaboration with experts worldwide, developed a series of three linked international workshops on Forces and Forms of Change in Doctoral Education Worldwide. These focused on how to best prepare PhD students to confront a complex set of social, political, technical, and health issues within a global setting as the next generation of leaders and scholars (Nerad and Heggelund, 2008). These programmes are also in accordance with the Banff Principles of Graduate Education, which promote understanding of best practices globally, learning from differences, promoting quality and engaging stakeholders to improve and advance graduate education (Council of Graduate Schools, 2007).

Categories of structured PhD programmes

Structured PhD programmes may be categorised as follows:

(i) Themed programmes: graduate research programmes that have social and commercial relevance are designed to allow for the establishment of links between HEIs, the business sector and the social economy. Such themed programmes whether within a traditional discipline or in an interdisciplinary context, allow the development of mutually beneficial relationships between the HE sector and other stakeholders in society which is essential for the sustainability of graduate programmes in the longer term.

(ii) Research-led programmes: here the doctoral student is embedded in a thematically aligned community of researchers. Through access to networks linked to industry, business, public

services, NGOs and other stakeholders
the potential for the graduate to engage
in innovative and creative research
is maximised. A student's research
programme may involve working
alongside a cohort of peers in a cohort
PhD model where peer learning adds
value to the programme.

(iii) Student-centric programmes: these are
customised student-specific programmes
of research designed for the individual
student's needs. The requirements
of the individual student are built into
and represented in the governance of
the programme. The research project
undertaken by the graduate student is
supported through customised taught
modules that are selected in the context
of the research topic and professional
skills needs of the student.

(iv) Programmes leading to critical mass
in national priority areas: national and
international research priorities are
clearly articulated in policy statements
relating to areas such as sustainable
development, green technologies,
nanotechnology, human security, and
poverty reduction. Where a programme
is established to address a specified
national or international priority research
area, such a programme is likely to be
adequately funded, expertly focused and
potentially sustainable.

(v) Programmes for international mobility: in
many fields doctoral education involves
integrating international, intercultural
and global dimensions as key elements.
This may incorporate international travel

for laboratory visits, familiarisation
with technology and conference
presentations. Alternatively it may focus
on home-based benchmarking with world
class research centres, virtual sharing of
knowledge with international research
networks of excellence, close cooperation
with parallel programmes abroad, and
taught modules on global opportunities
for research.

(vi) Benchmarked programmes: these pertain
where a themed graduate programme
is benchmarked against a high-quality
international programme of a similar
size in the same field to assess its own
status and to make improvements in
programme quality where relevant. Many
graduate programmes place emphasis
on national and international cooperation
with professional colleagues and have
staff members with established links in
other institutions and other countries.

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Chapter 8

The Role of Information and Communications Technology in Research Capacity Building

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Introduction
Reliable, accessible, high speed Internet and network connectivity is a fundamental requirement for the conduct of high-quality, high-impact research today. High speed communications are part of the basic infrastructure of a modern university, supporting efficient administration, ensuring a global presence on the web and helping with managing student information systems.

The focus of this chapter is on those elements of the Information and Communications Technology (ICT) infrastructure which are directly relevant to RCB; specifically National Research and Education Networks, Research Support Systems and Digital Repositories, and finally e-Learning technologies that support research-led teaching. A key theme running through this chapter is that of collaboration and the need for a cooperative approach both within and among institutions in order to deliver a robust and cost-effective ICT infrastructure.

National Research and Education Networks
A National Research and Education Network (NREN) is a network for a closed user group which has advanced connectivity requirements to support research and education needs. It provides the infrastructure for data communications and data services for the group. Commonly NRENs rent telecommunications lines from commercial providers, while owning the equipment required to route traffic through them. Traditionally, an NREN provides services to students, academic staff, researchers, administrative and support staff in the HE sector. A common feature of NRENs is that they are endorsed by national government and act as a single entity in their country. Typically, the government

department with responsibility for the NREN is the Ministry of Education or the Ministry of Communications.

NRENs play an important part in supporting research. Each is an independent organisation since its role is linked, not only to research, but also to education generally within a country. An NREN is an ICT / telecommunications network operated by and on behalf of the HE community in a single country. Examples of NRENs include HEAnet in Ireland <www.heanet.ie>, MAREN in Malawi <www.malico.mw/maren>, MoRENet in Mozambique <www.morenet.mct.gov.mz>, TERNET in Tanzania <www.ternet.or.tz/> and RENU in Uganda <www.renu.ac.ug>. The area of operation of an NREN does not extend beyond the country in which it has been established. In order to participate in and link to the global HE community, an NREN provides connectivity to a wider, usually continent-wide, Regional Research Education Network (RREN), such as, for example UbuntuNet in Africa <www.ubuntunet.net> or DANTE in Europe <www.dante.net>. A number of RRENs and NRENs, while formally established, are still at the early stages of construction and roll-out, particularly in Africa.

Why establish an NREN instead of simply using the services provided by a commercial Internet Service Provider (ISP)? The answer lies in the nature of the requirements of the HE sector which generally cannot be met by the commercial ISP market. Specifically, the discovery nature of education and

research requires more open access than that offered by commercial data services or corporate networks. Additionally, the amounts of data to be transported by the network and the performance of the network are significantly higher than for other user groups. Indeed new more collaborative forms of education and research are placing even greater demands on network connectivity both nationally and internationally. Research partners are just as likely to be on the other side of the world as in the university down the road. Video conferencing, for example, is now routinely used across the HE sector for everything from recruitment interviews to research collaboration. Furthermore, researchers may themselves be engaged in telecommunications research involving the development of new data protocols and services which a commercial ISP would be reluctant to service. These are some of the reasons for needing a dedicated / closed network to meet the needs of HE.

The first challenge in seeking to establish an NREN within a country is that of creating an initial association of HEIs to drive the establishment of an NREN forward. Generally this initial core group does not involve all HEIs within the country. Even if all HEIs are involved from the start then the principles of inclusivity and neutrality which underpin the NREN approach means that they must allow for the inclusion of new HEIs in the future. The association must also ensure that all members are treated equally and have equal representation in the governance structure. It is important to be clear at the

outset what the entry criteria should be, and usually this is defined by the funding model. For example, the typical European NREN community provides services to publicly funded institutions only, specifically excluding private institutions, and so, only publicly funded institutions are eligible for membership of the NREN. In general, European NRENs are exclusively and directly funded by national governments and they are explicitly precluded from receiving private funding. By contrast, the approach taken in the USA is more open and funding may come from different sectors; hence the criteria for access are more flexible. Both approaches have their advantages and disadvantages but it is essential to be clear from the outset and to incorporate these rules into the statutes of the newly formed NREN.

The operation and development of an NREN requires specialised personnel. It would be impractical and too expensive for each participating institution to have experts in all new or niche technologies. The NREN structure allows such highly skilled personnel to be based in the NREN organisation, acting as a shared resource so that the whole community shares the cost and can benefit from the expertise. This therefore leads naturally to the requirement for independence of the NREN from the institutions it serves in order to ensure the sustainability of the organisation. Given the variety of institutions in the HE sector in a country, conflicting demands and priorities are inevitable and hence the policies of the NREN must support all members equally and

avoid favouring those that are, for example, larger, better resourced, or more research-oriented.

The financial sustainability of the NREN is clearly of critical importance. Under the European model, funding comes from national governments and the HEIs. Governments are generally willing to provide capital as opposed to recurrent funding. However, ICT equipment has a limited lifespan and therefore each renewal cycle, typically 3-5 years, requires a significant capital investment. This needs to be built into the funding model from the start. The typical NREN rents bandwidth from the commercial sector and these rental costs also represent a recurrent charge. However, by joining together in an NREN, collectively the HEIs have much greater bargaining power in the market place than institutions acting alone. Furthermore, the longer the rental term procured, the more advantageous the price. Generally speaking, capital investments are provided by the Government, while recurrent costs are covered by member institutions. Hence long term commitment to funding both from government and from participating institutions ensures the sustainability of the NREN.

In addition to providing a physical infrastructure, the NREN can also have the role of representing the HE community both nationally and internationally. This representation can be to the Government as a means of articulating the needs of the HE community as a whole in a consistent

and coherent way, or as an advisory body to the Government on technical ICT issues related to education more generally. Equally, the NREN can act as a single point of contact with commercial providers of ICT goods and services. This allows the NREN to negotiate prices and conditions that a single institution could not do on its own. However, the position of an NREN with respect to commercial providers can be a difficult one, especially if it does not adhere to the closed user group model. Regardless of whether the telecommunications market is a monopoly or open and deregulated, the NREN can be perceived as a threat by the commercial ISP sector. This is a recurrent concern for the NREN community and should be managed through adherence to transparent procurement procedures and strict confinement of the use of the network to the closed group.

In the IAP programme, a key organisation is the UbuntuNet Alliance for Research and Education Networking, a pan-African RREN, with members currently in 12 African countries, including all the IAP partner countries. Ubuntunet is charged with providing high-speed connectivity to the African community. It aims to provide an African network to which the African NRENs connect. UbuntuNet member NRENs are currently renumbering, identifying African IP addresses so that they can have a discrete and identifiable set of traffic. This is routed through the UbuntuNet London router and on to the global RREN community.

It is only within the last two years that it is possible for this vision to become a reality due to developments in the telecommunications market in Africa, where before there was previously almost no option but to use satellite communications. Currently there are three submarine cables along the east coast of Africa linked to Europe, namely SEACOM, TEAMS and very recently, EASSy. This connectivity provides new options in the form of high-speed communications, as well as competition among service providers. At the national level, NRENs in the IAP are building dedicated telecommunications networks. FEAST, the EU funded feasibility study <www.feast-project.org> has shown that there is enough infrastructure and ready research and education communities to start the first phase of AfricaConnect, the continuation of the FEAST Project. This aims to deploy a network of sufficient capacity and affordability so that the Sub-Saharan countries have a digital connection for their students and researchers of the quality required to make them part of the global RREN community. A pan-African network would interconnect the African NRENs to Géant, the European fibre cable and to the global research and education network. This would increase collaboration and research output, as well as transforming curriculum and teaching methodologies to move more to learner centred and e-Learning methods.

The role of library and information services in supporting research
Supporting research is one of the core functions of library and information services

in education (Webb *et al.*, 2007). In recent years, libraries across the world have moved increasingly to the provision of electronic information, driven particularly by a surge in the number of academic journals available online. As a result of this, a number of access programmes have been established, such as INASP's PERii scheme <www.inasp. info>, eIFL <www.eifl.net> and domain-specific schemes such as HINARI <www. who.int/hinari> in health, AGORA <www. aginternetwork.org> in agriculture and OARE <www.oaresciences.org> in environment. These initiatives have enabled the negotiation of substantial discounts with publishers for HEIs in developing countries, sometimes as much as 98%, enabling African libraries to access more resources with limited budgets. In Malawi, for example, the establishment of the Malawi Library and Information Consortium (MALICO), has strengthened libraries and given them negotiating power. Contrary perhaps to common perception and thanks to the initiatives referred to above, many African universities do in fact have access to as broad a range of scientific journals as most western universities (Salanje and Ngwira, 2004). For this reason research activities and outputs have increased in quantity and quality in most Sub-Saharan African universities (Adams *et al.*, 2010), leading to increased demands for library and information resources (Musoke, 2008).

However, Harle (2010) has reported that African researchers, students and lecturers believe that their library did not subscribe to the journals they needed. Current evidence

shows that this is not the case in Malawi, for example. So why are researchers not aware of what is available? Librarians frequently cite the lack of computers as an impediment to the availability of electronic journals to researchers. While this is true, the reality is that more and more students and lecturers own personal computers. This presents an opportunity for libraries to improve accessibility to electronic resources. 'Certainly, today's library will not serve the next generation client. As the continent is closing in on fast and affordable connectivity, librarians should drive ICT investment in their institutions. It is important to understand user needs other than speculating and using our prejudices. We too quickly say that the problem is lack of computers in our libraries. However, the ACU / Arcadia has shown that the problem is providing access to the electronic journals we subscribe to. Having computers in the library is one thing and providing wireless internet might be a worthwhile solution as the study recorded significant numbers of personal laptops' (Harle and Wella, 2010: 5).

Information management
Using the Internet, anyone can be an author and anyone can 'manage' information. There are many instances of researchers attempting to manage information themselves with or without the assistance of ICT personnel. It is increasingly common practice for authors to upload research onto personal or departmental web pages. While this provides a method for storing information, it does not make it readily

accessible. Information management is a specialised field with standard procedures and tools. It seeks to make the information easily accessible and searchable, as well as storing it for the future. The following cases from Malawi are examples of valuable information which has been generated in Malawi but which is managed in less than optimal ways, making it difficult or impossible to access.

Case 1: Accessibility of published journal articles
Research such as that shown in Figure 8.1 below, conducted at Bunda College of Agriculture in UNIMA, is of high value for national development. One would expect that this article published by college staff in *Aquaculture Research*, would be more easily accessible in Malawi than in any other country. Surprisingly, the modes of access to such articles are no different to those for other nationalities, with an average fee of US $52 per article. This is out of reach for many Malawians.

Figure 8.1: Journal article by Malawian researchers

Case 2: Theses and dissertations
The College of Medicine in UNIMA has established an international medical college. The College has the largest number of grants and research outputs in the university. Studies conducted at the College have informed health policy and practice nationally. However, the College lags behind in terms of the management of its research publications. Its webpage has links to theses and dissertations from the Master of Public Health programme. These important research outputs which contain evidence to inform public health policy are not readily searchable or accessible.

Case 3: Book chapters
A book entitled *Poverty in Africa* has been produced by two Malawian authors, one of whom works for The National Herbarium and Botanic Gardens of Malawi. While the entire book is of relevance to Malawians, a particular chapter 'Poverty and Maternal Health in Malawi' is of central importance, discussing maternal mortality, an issue which has haunted the country for a long time. It should be required reading for all researchers and policy-makers in the field. Yet with an average price for the book of £90 it is out of reach for most Malawians.

Some lessons can be learned from these cases. Case 1 and Case 2 are examples of information resources that are not fully accessible. The papers are available either from a publisher's website (Case 1) or they are deposited on a server with a link on a website (Case 2). Retrieval of these articles is serendipitous. Researchers need to realise that web design is not the same

as information management. There is a false perception that simply because the information is in electronic format on the web it is available worldwide, ignoring the tools developed by librarians over many years to describe documents and aid retrieval. Webb *et al.* (2007) contend that management of digital objects and long-term preservation of research may not occur if research output is posted on personal or departmental websites. All of this points to the urgent need for collaboration among researchers, librarians and ICT personnel to manage research publications and electronic resources.

Case 3 demonstrates a scenario where a Malawian student or researcher has to buy a book in order to access a chapter that is relevant to Malawi. The cost of the book is out of reach for many Malawians. Besides, since the book is published outside Malawi, other charges may apply. Globally, libraries are using open access institutional repositories to collect and provide access to local content. Many research publications in UNIMA are not accessible to students and other researchers. Important research outputs are locked away in offices or are poorly managed and hence inaccessible. This can lead to unnecessary duplication of research, limited local content in training programs at all levels of education and limited impact of research on public policy (Britz *et al.*, 2006).

Information management skills cannot be replaced by ICT skills. Rather, they complement each other. Librarians use

metadata to describe documents. They also store the documents in repositories that have advanced and specialised tools designed to aid retrieval with precision. 'Librarians have embraced the new developments / advances in ICT and many have been trained and re-trained to be able to update their knowledge and skills. This enables librarians to competently implement ICT projects and to instruct and guide users.' (Musoke, 2008: 5). Librarians need to understand and respond to changing user needs and to engage proactively with the research community. In this way they will make themselves more relevant to the research world of the 21st century.

Research Support Systems and Digital Repositories: Research Infrastructure, Open Access and the IAP Portal
Integrated research information systems and open access digital repositories are a key component within national and institutional research infrastructures and are good examples of the applications that can be built according to Pehrson's Axioms (Pehrson, 2010).
- HEIs and research institutions are key actors in the creation of the knowledge society
- they need a common dedicated network infrastructure; non-connected institutions cannot effectively fulfil their missions
- African universities need to be connected to global resources like their peers on other continents
- connections are achieved through NRENs and RRENs using leased lines

The IAP has constructed a Current Research Information System (CRIS) and an integrated open access research repository within its Web Portal <www.irishafricanpartnership.ie>. Along with discussion forums, this 'Research Register' and 'Digital Repository' allow the IAP to collect, organise and disseminate the work of individual researchers, the partner institutions and related agencies, for access, impact, accountability, value for money, new knowledge and innovation, partnership building and translational research / evidence-based policymaking.

According to Chan *et al.* (2010) 'most new knowledge is largely reported from the richer countries, where spending on research and development is highest.... researchers in 8 countries – led by the United States, the United Kingdom, Germany and Japan - produce almost 85% of the world's most cited publications....163 other countries, mostly developing nations, account for less than 2.5%.... and.... only 10% of the global health research is undertaken in the developing world.' As emphasised in preceding sections of this chapter, and elsewhere in this book, the voice of the African researcher is often not heard, either internationally or locally. In response, the South African Research Universities Association (SARUA) bases its science and technology development programme on four fundamental needs, as described on their website <www.sarua.org/?q=content/science-and-technology-expert-advisory-group> and Belgarrab (2007). These are to encourage new scientists, especially women; retain and support leading African scientists; improve the quality and quantity of science and scientific publications; and build a vibrant knowledge economy in the region.

Open Access as part of the solution

According to Suber (2010), Open Access is 'putting peer-reviewed scientific and scholarly literature on the internet, making it available free of charge and free of most copyright and licensing restrictions and removing the barriers to serious research'. Publication details (or metadata) are available to search engines like Google, Google Scholar and harvesters like RIAN <www.rian.ie> and OAIster, thereby maximising impact and global reach. This explains why the number of institutional repositories around the world is increasing but their distribution is uneven, as shown in Information Box 8.1.

Open Access institutional repositories are already established in all of IAP HEIs in Ireland. Many of the African HEIs in the IAP either already have repositories up and running or have plans to construct one. To support those partners currently without an institutional repository and to manage additional content from other sources, the IAP has constructed an open access Digital Repository linked to a Research Register which is available through the IAP website <www.irishafricanpartnership.ie> and its content is accessible via Google and other search engines (Refer to Information Box 8.2 for further information).

Information Box 8.1: Distribution of repositories worldwide. Source: www.opendoar.org. Accessed July 11th 2010

Continent	Number of Repositories	% Of the Total
Europe	824	49
North America	434	26
Asia	221	13
South America	85	5
Australasia	78	5
Africa	41	2
Caribbean	7	0
Central America	6	0
Total	**1696**	**100**

Research shows that by making publications freely available on the web, an author can gain 50% to 250% more citations (Opcit Project, 2010). The rapidly-growing practice of academic authors allowing free and unrestricted access via the web to their research publications, research data and teaching and learning resources can help to provide a solution to the issue of the 'invisibility' of African research. The IAP repository provides a vital communication tool for its partners and the broader development community in making relevant publications available in full text and without

Information Box 8.2: IAP Portal tools, services, resources and benefits

- Links Irish and African universities in virtual community
- Supports collaborative research with African universities
- Communications forum for members of the IAP
- Electronic consultation platform for the IAP
- Digital repository (Open Access)
- Research register (Publicly Accessible)
- Promotion of researchers' outputs
- A reciprocal facility for finding research partners
- Automated generation of electronic curricula vitae
- Personal URL links from your business card or website
- A means of creating and maintaining up-to-date publications lists
- Upload publications onto the IAP Portal and open access digital repository and thereby maximise audience and impact on the web.
- Compliance with funders' mandates for dissemination of research outputs

restrictions. It simultaneously supports RCB by maximising the exposure and impact of the research outputs of the IAP partnership. This is particularly important as most research evaluations use bibliometrics as one indicator of research excellence. Also important to funders and researchers is compliance with the Open Access mandates of funding councils, such as the Wellcome Trust, NIH, all UK research funding councils, almost all Irish research funding councils, the EC, European Research Council and others. All of these agencies require, as a condition of funding, open access to the publications arising from that funding within a specified period of time. A database of funder mandate policies is available at <www.sherpa.ac.uk/juliet/>. There are currently some 24,000 peer reviewed research journals, so there is an issue of getting access to research, especially if resources are only available through expensive subscriptions. Surveys show that 92% of journals permit lodging of some version of a paper in an open access repository <www.sherpa.ac.uk/romeo>. Some allow deposit of the publisher's PDF, and most allow open access to the author's post-peer review version of a paper ('post-print').

There are many misconceptions about Open Access. Some researchers erroneously believe that open access runs counter to peer review standards or that it may breach copyright or put publishers out of business or cause libraries to cancel subscriptions. Open Access supports peer review and favours the

increased impact of peer reviewed papers; it operates in accordance with publishers' copyright policies; papers in open access repositories link directly to the publisher's 'official' version and provide citations to that version. Open Access provides ongoing public access to publicly-funded research outputs, supports interdisciplinary scholarship and evidence-based policy-making. Additional information is available at MIT Libraries' 'Dispelling Myths About Open Access' <www.info-libraries.mit.edu/scholarly/open-access-initiatives/ faq/dispelling-myths-about-open-access-2/> and in Jessani and Reid (2008). Details on how to use the IAP register and repository can be found in Information Box 8.3 at the end of this chapter.

Enhancing teaching and research through e-Learning

e-Learning or technology-enhanced learning is the development and effective use of digital technologies to support learning, teaching and research. Learning technologies can consist of multimedia / animations, virtual worlds, video, podcasts, games, simulations, mobile learning, virtual learning environments (VLEs), content management systems (CMSs) and web 2.0 technologies. They range from supported learning such as making slides available on the web, through blended or hybrid learning to learning that occurs 100% online (Figure 8.2). Sound e-Learning is based on instructional design principles that take into account learning theories and the outcomes for the learner.

| supported learning | blended/hybrid learning | learning that occurs 100% online |
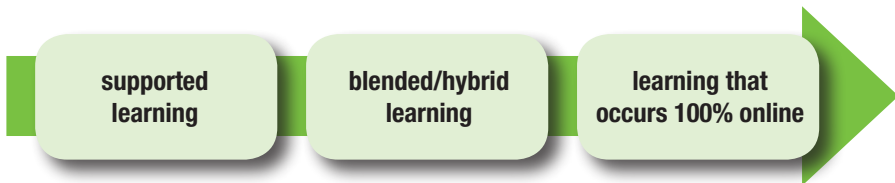
Figure 8.2: The spectrum of e-Learning

Given its nature, online distance education is well-matched with e-Learning and flexible learning but is also used for in-class teaching and blended learning.

e-Learning is not a panacea for teaching and learning but can be harnessed in combination with pedagogical good practice to achieve effective student-centric learning (Reigeluth, 1999; Kizza, 2008). However, e-Learning and digital technologies are having a significant impact on the way teaching and research is done. There is evidence to show that students value being in a research-rich environment. Today's graduates must be able to analyse and contribute to research. Understanding how knowledge is created and developed is critical in today's knowledge society. For academic staff, forging productive links between teaching and research helps them to manage better what would otherwise be conflicting demands. In strong research departments, students appreciate the value of the research focus. For departments with limited access to research funds, developing the research-teaching nexus can help engender a research profile (ibid.). Internationally, there is a growing demand for third level education with dramatic

increases in participation rates from much more heterogeneous groups of students (COIMBRA, 2001). HEIs have moved their strategic direction towards more inclusive curricula that are relevant to national economic and social goals. An increasingly diverse student population results in different expectations, motivations, skills and learning models where students can take courses for credit from other institutions and providers. Against this background, there are two major forces at work. Firstly, there is a push towards de-institutionalisation and "market-led" education which is associated with increased autonomy for the student who can choose from a wide range of learning opportunities. This model is not really supported by the traditional HE sector. The second relates to innovation as a result of education, including for example, life-long learning and the switch from teacher-centric to learner-centric education with increased autonomy for learners.

Best practice dictates that there are three key areas which institutions seeking to build effective capacity in e-Learning must address. First is the e-Learning strategy which should be aligned with institutional strategies for teaching and learning (Carroll

et al., 2003). Given the need to create a strong synergy between teaching and research, it should also integrate with the research strategy (Somekh and Lewin, 2005). The e-Learning strategy should indicate which pedagogic approaches are favoured, for example, blended learning, self-learning resources, or self-assessment. Second is to develop the skills base amongst their staff. A small dedicated team of learning technology and pedagogic experts is required to work with and support academics in the development of learning resources and to ensure best practice. By keeping abreast of the latest developments, the team will also ensure that the institution is well placed to take advantage of the latest technologies / paradigms, for example leveraging social networking tools to enable learner collaboration. Third is the need to put in place the appropriate technical infrastructure of servers and networks and associated software (VLE, Learning Management System). There are excellent open source VLE solutions, such as Moodle, now available.

TCD, with almost 16,000 students, of whom approximately 4,000 are postgraduates, has adopted many of these technologies. Most students are full-time and small group teaching is a feature of undergraduate education in TCD. The Centre for Learning Technology (CLT) <www.tcd.ie/CAPSL/clt/index.php> was established in 1999 and offers a range of services and supports through a small team of educational technologists under the direction of the Centre for Academic Practice and Student Learning. CLT acts as a one-stop shop for staff wishing to enhance teaching and research through new media and technology. By funding a number of innovative projects on a competitive basis each year through the National Digital Learning Resources (NDLR) service, CLT built capacity across all departments and schools in the use of learning technology. It also acts as the TCD node in the NDLR network through which it promotes collaboration and partnership with other HEIs.

The NDLR service <www.ndlr.ie> is an Irish HE sector service funded by the Irish HEA to enable the sharing of digital learning content and associated teaching experience across all HEIs. The NDLR mission is "to promote and support HE sector staff in the collaboration, development and sharing of digital learning resources and associated teaching practices". Staff from different disciplines can share effort and expertise as they raise the bar collectively for how they support their students' learning. They can embed research into their teaching and potentially embrace partnership with research and industry, both in Ireland and internationally. The NDLR achieves these objectives by supporting staff in sharing digital learning resources / associated teaching practices through funded local and national projects. The outputs and activities of these projects feed back into the activities of the SMARTCoPs (SMART Communities

of Practice) (Maguire and McAvinia, 2009). Local and National learning resource development projects supported by the NDLR can be accessed from <www.ndlr.ie/resources/about.php>. NDLR's SMARTCoP homepages can be accessed from <www.ndlr.ie/communities.php>. Find and share NDLR teaching and learning resources via the NDLR repository, which can be accessed at <www.dspace.ndlr.ie/jspui/>.

Information Box 8.3: How to use the IAP Research Register & Digital Repository

Register with the system via <www.irishafricanpartnership.ie>. Complete the details, upload your photograph and agree to the terms presented on-screen. In order to access the Research Register, you will have to wait until you receive an email with your username and password. As soon as you receive these login details, complete your Research Profile via the Research Registry. Full details on how to work with the Research Registry and upload your publications to the Digital Repository are available from the website. If your institution has its own repository, insert a link to your publication in that repository on your Research Profile publication list.

Those members of the IAP who have agreed to act as a subject specialist or a thematic leader for the IAP are identified on the website. They will help to identify key people and content associated with the IAP thematic areas, and will welcome any additional information from users. Please include the appropriate IAP thematic areas on your Research Registry profile in the 'Research Interests' area and in the key words associated with your publications in your local or IAP repository.

Chapter 9

A Model Summer School Workshop for Research Capacity Building

The Irish-African Partnership for Research Capacity Building

Introduction

The purpose of the Model Summer School Workshop presented in this chapter is to provide a resource that will assist users to build capacity in research management and administration within their respective institutions. It comprises six self-contained modules based on the themes already discussed in the foregoing chapters of this volume:

i.   Research Management
ii. Research Bid Writing
iii. Research Finance
iv. Human Resource Management
v.   Graduate Schools, Graduate Supervision and Structured PhD Programmes
vi. The Role of Information and Communications Technology in RCB

These themes were selected in response to priority needs identified through a Stakeholder Consultation referred to in Chapters 1 and 2, and subsequently reinforced by senior management of partner institutions in the IAP as being of primary concern in RCB. The following sections offer guidance on how to mediate the knowledge and skills of the themes to HE institutions and relevant staff cohorts. The content and procedure can be modified and adapted to fit local RCB needs. While the Model Summer School Workshop can be delivered as one package of six modules, it is also possible to implement one module at a time depending on available resources and needs. Apart from the Research Infrastructure module which is seven hours long as it includes a practical workshop for uploading electronic files and research profiles, the remainder of the modules are designed to run as three-hour blocks.

This Model Summer School Workshop was first conducted by the IAP at Chancellor College, UNIMA, Zomba, Malawi in March 2010. The full workshop programme, along with the list of participants and copies of the PowerPoint presentations delivered by the respective workshop facilitators, is provided on the accompanying CD. On the basis of the positive reception it received at Zomba and subsequent feedback, it is hoped that institutions making use of this model resource will achieve improvements in RCB performance.

Module 1: Research Management

FACILITATOR NAME:

WORKSHOP DURATION: 3 hours

TARGET AUDIENCE:
A group of approximately 20 staff in university leadership, management or in research support roles. It may also be informative for PIs and other research staff.

MAIN CONTENT:
Context including national priorities
Research management cycle: From research funding information to project outputs
Risk and compliance: Contractual terms and conditions / internal processes / post-award procedures / data management
Integrity and research ethics; IP
Dissemination
Case examples

THEME DESCRIPTION:
Research management is an essential element of administration in HEIs. It plays an integral role in supporting staff and researchers to compete for external research funding and deliver research outputs of the highest quality and impact. It involves providing key professional expert advice, coupled with internal structures and processes to maximise the quality and impact of research. Research management does not operate in isolation – it is informed and guided in the long-term by regional and national needs and priorities. At the local level, it needs institution-wide expertise from a central RSO to individual units such as Finance Office and HR – all of these play a role. Most importantly, it needs to be flexible and adaptive in a rapidly changing world as funding priorities of governments, industry and other elements of the social context are constantly changing.

OVERARCHING GOALS:
Understanding the key tasks and functions in research management
Recognition of contractual risk and compliance issues and knowledge to manage these
New knowledge to enhance the research support function in participating institutions

LEARNING OBJECTIVES:
Recognise the key responsibilities and activities associated with research management in a
university setting
Identify the key risks and compliance issues and how to manage them
Express an understanding of the key principles associated with Research Ethics and Integrity

METHODS OF DELIVERY:
Lectures and discussion using MS PowerPoint presentation
Group exercises based on case studies

REQUIRED MATERIALS AND RESOURCES:
Data projector and screen; flip chart; white board and markers; paper and pens; handouts

READING MATERIAL
- All prior reading suggestions sent to participants in advance of the workshop.
- Global Research Management Network (2005). Statements of good research practice.
  <www.globalrmn.org/documents/goodpracticestatements.pdf> Accessed 31 July 2010.
- Global Research Management Network (2006). International Research Management:
  Benchmarking Programme. Report to HEFCE by the Association of Commonwealth
  Universities. <www.globalrmn.org/documents/2006benchmarkingreporttohefce.pdf>
  Accessed 27 July 2010.
- Kulakowsk, EC and Chronister, LU (eds.) (2006). *Research Administration and
  Management*. Sudbury, MA: Jones and Bartlett Publishers.
- Raftery, D and Nasinyama, GW (2010). Research Management (Chapter 3 of this volume)
- Wellcome Trust (2005). Guidelines on good research practice. <www.wellcome.ac.uk/
  About-us/Policy/Policy-and-position-statements/WTD002753.htm> Accessed 27
  July 2010.

Table 9.1: Research Management Workshop Procedure

Step	Mins	Content	Facilitator's Activity	Participants' Activity
Introduction	15	Introductions	Invites participants to introduce themselves and what they hope to achieve	Self introduction
		Brainstorming	Brainstorming activity: Role of research office in supporting RCB and Research Excellence	Sharing views of role of Research Office in own institution
		Workshop objectives	Introduction of set workshop objectives	Taking note of workshop objectives
Topic 1: Research Management Cycle	30	Research Management Cycle; From research funding information to research outputs: Pre-proposal management Post-award management Risk and compliance	**PowerPoint (PPT) Presentation 1** **A:** Pre-proposal Management Institutional / regional strategic and policy framework Research funding information The role of internal funding support Research proposal development Internal controls and processes **B:** Pre-proposal Management Contract negotiations and approval Compliance / contractual terms and conditions Project management (including reporting, cost claims and audits) **C:** Risk and compliance (financial, legal, reputational, research integrity, disclosure of confidential information, discussion of key risk categories, how to identify them, management of risk…	Questions / comments for immediate clarification as necessary during the course of the presentation Discussion and questions at the end of the presentation
Discussion 1	30	Case study material	Provides case study material and divides up participants in groups of 5-6.	Discussion of case study material
Coffee / tea	20		**Coffee / tea break**	

Step	Mins	Content	Facilitator's Activity	Participants' Activity
Topic 2	30	Research Ethics and Integrity	**PPT 2** Research ethics: Principles and processes Research Integrity: Good research practice Maximising research outputs and dissemination of results for impact	Listen and ask questions / comment at different points of the presentation.
Discussion 2	30	Case study material	Distribute case study material for groups (as above) discussion. See Research Management PPT slides 33 and 34 on CD in-set.	Review scenarios using a research integrity / ethics perspective
Conclusion	25	Summary and close of session	Workshop review and summary of key Learning Outcomes - structure, processes and training to support Research Excellence - Distribution of workshop evaluation forms	Discussion and questions; completion of the workshop evaluation forms

Module 2: Research Bid Writing

FACILITATOR NAME:

WORKSHOP DURATION: 3 hours

TARGET AUDIENCE:
A group of approximately 20 Academic staff and Research Officers engaged in writing research bids.

MAIN CONTENT:
Quality and excellence in a research application
Perspective of reviewers drawing on actual examples of funding applications and reviewers' comments

THEME DESCRIPTION:
The objective of this grant writing workshop is to get participants thinking more like reviewers. Putting themselves in the place of members of a scientific review panel will give them a better appreciation of what they want to aim for when preparing their own applications. Before coming to the workshop, it is essential that participants have read the preparatory material sent to them in advance. This includes grant proposals from relevant fields and a scoring template to rate the proposal(s) across a range of dimensions. In the workshop, participants should bring their commentary and score for each proposal that they have read and rated. This workshop will assist the participants to:

- find out what makes for quality and excellence in a research application
- approach future proposal-writing tasks with greater confidence

OVERARCHING GOALS:
Know and understand issues involved in making successful research bids (identifying research problems; setting research questions; selecting methodology; dealing with ethical issues)

By looking at examples of research applications, develop an understanding of the criteria involved in assessing applications (examples will be chosen from applications made at the local, national and international level)

Understand the skills involved in budgeting for research; and know and understand what makes for quality and excellence in a research application.

TEACHING AND LEARNING OBJECTIVES:
Identify the individual needs of course participants and where possible address these needs
Articulate the range of skills involved in making research bids
Practical support to develop participants' skills for research bid writing

METHODS OF DELIVERY:
Drawing on actual examples of funding applications and reviewers' comments, the session
will include both a formal presentation and workshop activities including group work (critical
analysis of funding applications in area of special interest) and questions and answers during
and at end of session

REQUIRED MATERIALS AND RESOURCES
Powerpoint projector; flip chart; loose papers; markers; grant proposal(s) from the relevant
field(s); scoring template for participants to rate the proposal(s) across a range of dimensions

READING MATERIAL
- All prior reading suggestions sent to participants in advance of the workshop.
- Kee, F, Mark, R, and Mugimu, CB (2010). Research Bid Writing (Chapter 4 of this volume).
- Samples of funded and non-funded research projects including reviewers' reports
  and researchers' responses (participants may also be invited to bring along copies of
  successful and non-successful applications for sharing in the group, but should be
  assured of confidentiality)

Table 9.2: Research Bid Writing Workshop Procedure

Step	Mins	Content	Facilitator's Activity	Participants' Activity
Introduction	25	Self introduction	Asks participants to introduce self (name, institution, school / department, and experience with bid writing…)	In not more than one minute briefly introduce self
		Workshop overview: Goals, objectives and structure	Gives a formal presentation outlining the key aspects of the workshop and how it is going to be structured	Listen, followed by questions and comments
Group work 1	30	Scoring grant proposals	Divides participants in groups of 5-6 to discuss each other's observations and scores on the research proposal(s) they would have received prior to the workshop.	In small groups discuss grant proposals and own scores with the aim of agreeing a consensus score. Nominate a reporter who will give feedback in plenary
Preliminary feedback session	25	Justification of scores and specific feedback to be addressed in a re-submission	Invites rapportuers for each group to provide preliminary feedback	In not more than 5 minutes each rapporteur briefly justifies the group's score and provides the researchers with feedback and questions to address in a re-submission.
Coffee / tea	20		**Coffee / tea break**	

Step	Mins	Content	Facilitator's Activity	Participants' Activity
Group work 2	25	Considering scores and feedback from the actual grant reviewers	Provides a copy of the real referees' reports and the questions they raised for the researchers to address.	In small groups discuss to come up with responses that they feel should be made by the researchers to these concerns. Nominate a reporter who will give feedback in plenary
Feedback session2	25	Researchers' responses to reviewers' concerns: Participants' views		Reporters for each group provide feedback: re: researchers' responses
Handouts of actual responses and final panel decision	15	Actual researchers' response to reviewers' concerns	When all the group feedback has been heard, the facilitator provides the responses that were actually made by the researchers and the final decision of the Panel.	Take a few minutes to study the actual responses and panel decision followed by questions and / or comments
Conclusion	15	Sharing learning from the workshop	Provides a summary of the shared learning using a short power point presentation. Workshop evaluation	Listen and take note, ask questions and / or comment as necessary, evaluate

Module 3: Research Finance

FACILITATOR NAME:

WORKSHOP DURATION: 3 hours

TARGET AUDIENCE:
A group of approximately 20 Pls (and aspiring Pls) as well as officers in the Finance and Research Offices who deal with research funding issues

MAIN CONTENT:
International and local context – Funding Sources for research
Research grant life cycle and supporting administrative processes
Pre-award management
Costing and Pricing of research (with case study material)
Post Award Research Management – accounting and reporting
Risks and Controls

THEME DESCRIPTION:
This module provides an overview of the research funding arrangements within the UK HE system, illustrated by the research governance systems in place at QUB. The research grant life cycle is illustrated and details of how research grants and contracts are managed both at the pre-award and post-award stages are demonstrated. The module provides a particular focus on how research grants are costed using the fEC approach and how costs are translated into the prices charged to particular funders. Finally, the module highlights issues of control and management common to systems operated by HEIs whether they are in the UK, Ireland or Africa.

OVERARCHING GOALS:
Understanding the research management and funding process
Appreciation of the need for an integrated approach between academics, Pls and finance / administrative staff
Taking on board the need to ensure research is sustainable within the institution

LEARNING OBJECTIVES:
Outlining the elements in costing and pricing a research proposal
Demonstrating understanding of the research management process, financial controls, definition of roles and responsibilities

Demonstrating understanding of how research grants should be costed and the basis for pricing decisions

Appreciating the risks involved in managing research and the necessary controls

METHODS OF DELIVERY:
Lecturing and discussion using MS PowerPoint presentation
Group exercises

REQUIRED MATERIALS AND RESOURCES:
PowerPoint projector, flip chart / white-board and markers

READING MATERIAL
- All prior reading suggestions sent to participants in advance of the workshop.
- Bennett, WN and Jeremiah, AB (2010). Research Finance (Chapter 5 of this volume)
- Higher Education Funding Council for England (HEFCE) (2008). Funding Higher Education in England. <www.hefce.ac.uk/Pubs/hefce/2008/08_33/> Accessed 31 July 2010.
- Queen's University Belfast (QUB) (2010). Research Support. <www.qub.ac.uk/directorates/ FinanceDirectorate/ResearchSupport/> Accessed 31 July 2010.
- Research Councils UK (RCUK) (2010). Dual Support System. <www.rcuk.ac.uk/aboutrcs/ funding/dual/default.htm> Accessed 31 July 2010.

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Table 9.3: Research Finance Workshop Procedure

Step	Mins	Content	Facilitator's Activity	Participants' Activity
Introduction	30	Introduction of facilitators and participants	Introduce self and ask(s) participants to introduce themselves (name and background)	Self introduction
		Structure of the workshop Objectives / outcomes of the workshop	Introduces the main structure, objectives and aims of the workshop using PowerPoint or any other available facility / equipment Ice-breaker activity: opportunities and challenges to research funding in the participants' units / institutions	Listen and take notes. Discussion of key issues of research funding such as limited sources, administrative support, etc.
Presentation 1 : Research Funding Context	25	International case studies e.g. funding of research in the UK system	PowerPoint presentation including issues of: dual support system, sources of funding and the RAE in the UK	Listen and ask questions / comment at different points of the presentation.
		Research funding in the local institutional context	Presentation of local institutional issues such as: Components of research funding and Resource allocation for research	
Group Exercise 1	35	Research Grant Life Cycle and Supporting Administrative Processes	Provides a case study of an EC Collaborative Research Funding (see Appendix 1 to Chapter 5 of this volume) and asks participants in groups of 5-6 to discuss Pre-award and Post-award issues	Discussion of pre- and post-award issues based on the provided case study (20 minutes). A representative of each group reports back group findings in plenary.

Step	Mins	Content	Facilitator's Activity	Participants' Activity
Coffee / tea	20		**Coffee / tea break**	
Presentation 2: Costing and Pricing	25	Costing and Pricing of Research	Background and presentation of issues such as TRAC, Full Economic Costing (elements of the cost, calculating the cost of research projects) and pricing decisions	Listen and ask questions / comment at different points of the presentation.
Group Exercise 2	20	Costing and Pricing of Research: Worked example	Provides a worksheet (see Appendix 2 to Chapter 5 of this volume) and asks participants in groups of 5-6 to categorise the given costs under the provided headings	Small group discussion
Presentation 3: Key Controls	15	Research Support: Key controls	PowerPoint presentation on issues such as post-award, project budget, management reporting, etc.	Questions and comments
Conclusion	10	Summary and Close	Review of main topics, distribution of evaluation forms	Comments, evaluation

Module 4: Human Resource Management

FACILITATOR NAME:

WORKSHOP DURATION: 3 hours

TARGET AUDIENCE:
A group of approximately 20 academic leaders / line managers and PIs

MAIN CONTENT:
Integrated employee approach
Recruitment
Performance management
Staff development
Succession / Human Resource Planning
Leading research teams
The integrated role of an academic
Organisational Capability and Results

THEME DESCRIPTION:
Management of resources is essential to achieving results in any organisation. With limited resources, it is the human relationships and how they are managed and developed that make the difference for an organisation. Most importantly, HR is a qualitative process (quantity is what you can count, quality is what you can count on). This workshop is intended to forefront the need to develop skill sets of people managing research teams. Participants will be introduced to crucial HR issues such as recruitment, performance management, career management, and managing research teams.

OVERARCHING GOAL
Understanding of the key issues involved in HR Management in order to maximise results

LEARNING OBJECTIVES:
Demonstrate understanding of the key elements of effective staff management
Demonstrate critical thinking on some of the key elements and models informing teamwork, leadership and the key HR processes of recruitment and performance management.

METHODS OF DELIVERY:
Presentation using MS PowerPoint
Discussion – share experiences and concerns
Challenge our collective thought processes
Share practices, processes and policies
Group Exercises

REQUIRED MATERIALS AND RESOURCES:
Data projector and screen; flip chart; white board and markers; paper and pens

READING MATERIAL
- All prior reading suggestions sent to participants in advance of the workshop.
- Bevan, S, Barber, L, Robinson, D (1997). *Keeping the Best: A Practical Guide to Keeping Key Employees, Report 337.* Brighton: Institute for Employment Studies (IES).
- Bray, T (1991). *The Selection Maze: How to Choose the Right Person for the Right Job.* London: Mercury Books.
- Grey, A and Tesha, J (2010). Human Resource Management (Chapter 6 of this volume).
- Hirsh, W and Jackson, C (1996). *Strategies for Career Development: Promise, Practice and Pretence, Report 305.* Brighton: Institute of Employment Studies (IES).
- Human Resources Policy/Manual for the respective institution(s)
- Landale, A (ed.) (1999). *Handbook of training and development.* 3rd edition. Surrey: Gower Publishing Ltd.

Table 9.4: Human Resource Management Workshop Procedure

Step	Mins	Content	Facilitator's Activity	Participants' Activity
Introduction and Brainstorming	30	Introduction of facilitators and participants Brainstorming session	Introduces self and requests participants to do so (name, university, current role and responsibilities) Provides issues for brainstorming: What is the key HR issue facing your University / Research function at this time? What do you want to achieve through this workshop?	Self introduction including response to the two brainstorm issues
Presentation and Discussion 1	25	Traditional personnel management; Contemporary personnel management; Organisational capability	Presentation offering distinction between traditional and contemporary approaches to HR Management.	Discussion: Reflection on key issues presented and how they link to own institution.
Discussion 2	30	HR Management in the context of RCB	Provides a contextual issue for discussion: You have a PI and staff (but there is a vacancy) and funding, what process would you go through to fill the post?	Discussion of key issues that might be considered in filling a research vacancy.
Coffee / tea	20		**Coffee / Tea Break**	
Discussion 3	50	Towards best practice in HRM Managing consultancy in universities	Introduction of key issues for discussion as a way forward: Why institutions normally don't do what is good practice? What can be done to improve research capacity through recruitment / performance management / retention process? How do we bring consultancy into the university?	Discussion of the key issues for the way forward

Step	Mins	Content	Facilitator's Activity	Participants' Activity
Conclusion	25	Discussion of other crucial issues in HRM e.g. culture and how to manage performance	Overview of other important HRM issues such as culture (creating the right culture, clear vision, communication, supportive environment, tolerance, clarity of objective, autonomy, accountability, responsibility, mentoring and coaching, reviewing performance, rewarding success – recognition…). Workshop evaluation.	Questions, comments and discussion

Complete workshop evaluation forms |

Module 5: Graduate Schools, Graduate Supervision and Structured PhD Programmes

FACILITATOR NAME:

WORKSHOP DURATION: 3 hours

TARGET AUDIENCE:
A group of approximately 20 administrative and academic staff charged with postgraduate research and training

MAIN CONTENT:
Establishing a Graduate School (case examples such as National University of Ireland, Maynooth or other examples)
Doctoral programme models – structured, cohort and themed, individual, joint programmes
Recruitment and selection:
- The importance of pre-doctoral training
- Procedures for admissions and approval – interviewing and evaluating a proposal
Pre-doctoral programmes: modularised programme of study on issues such as:
- Theories and conceptual frameworks
- Identifying a research question
- Qualitative and quantitative methods or hard sciences research methods
- Evaluating Research Designs and Research Proposal writing
- Generating and Analysing Data
- Dissemination, Composing and Defending.
- Supervision – effective PhD student supervision through supervisor training and support

THEME DESCRIPTION:
This module is directed at personnel whose task is to improve graduate research and education in HEIs. It constitutes a general guide to the development of support systems for the process of graduate research, education and supervision. The approaches discussed and demonstrated in the module have been found successful in enhancing capacity within HEIs for the recruitment and management of graduate scholars. Participants are called upon to reflect on how to increase graduate student numbers, superior quality of graduates, better support and more efficient management of research students, and improvements in the delivery of research-based graduate programmes in their own institutions.

OVERARCHING GOALS:
Enhancing university capacity to increase numbers and quality of PhD graduates.
Better and more efficient management and delivery of research training in participating institution(s).

LEARNING OBJECTIVES:
Share Irish / African approaches / best practices to developing graduate education
Develop a set of recommendations for cooperation to increase PhD graduations.
Develop a set of recommendations towards enhancing the capacity of research education for development.

METHODS OF DELIVERY:
Sharing Good Practices
Identifying Challenges and Opportunities for the institution / partnership

MATERIALS AND RESOURCES
PowerPoint projector; flip chart; loose papers; markers

READING MATERIAL
- All prior reading suggestions sent to participants in advance of the workshop.
- Fagan, H and Miguel, JJ (2010). Graduate Schools, Graduate Supervision and Structured Ph.D. Programmes (Chapter 7 of this volume).
- Irish Universities Quality Board (2009): Good practice in the organisation of PhD programmes in Irish Higher Education. Dublin: IUQB. <www.iuqb.ie/info/good_practice_guides.aspx?article=a5b735f2-8618-4af8-8713-9bee30a780fd> Accessed 19 July 2010.
- Nerad, M and Heggelund, M (2008). *Toward a Global PhD? Forces and Forms in Doctoral Education Worldwide.* Washington DC: University of Washington Press.
- NUI Maynooth (2008). PhD Research Supervisory Policy: <www.graduatestudies.nuim.ie/sites/graduatestudies.nuim.ie/files/documents/other/NUIM%20PhD%20Supervisory%20Policy%202008.pdf> Accessed 19 July 2010.
- NUI Maynooth (2009). Graduate Studies at NUI Maynooth: Strategies and policies. <www.graduatestudies.nuim.ie/sites/graduatestudies.nuim.ie/files/documents/other/NUIM%20Graduate%20Strategy%202009.pdf> Accessed 19 July 2010.

Table 9.5: Graduate Schools, Graduate Supervision and Structured Ph.D. Programmes Workshop Procedure

Step	Mins	Content	Facilitator's Activity	Participants' Activity
Introduction	25	Self-introduction	Asks participants to introduce self (name, institution, school/ department, experience with research training either as a lecturer / supervisor / administrator	In not more than one minute briefly introduce self
		Structure of the workshop Objectives / outcomes of the workshop	Introduces the main structure, objectives and aims of the workshop using PowerPoint	Listen and take note, questions for clarity, if any
Sharing Experience: Institutional Level	25	Ratio of undergraduate to postgraduate students in the various institutions	Asks participants to reflect on the undergraduate-postgraduate ratios	Reflect on status of undergraduate and postgraduate studies (Masters and PhD) in their institutions
	20	Case examples of postgraduate training (e.g. OECD, Ireland, NUI Maynooth)	Presentation of undergraduate and postgraduate training in the context of OECD, Ireland, South Africa, reference to the NUI Maynooth Graduate Strategy, local institution's graduate strategy, etc.	Listen and ask questions/ comment at different points of the presentation, as necessary
Discussion	30	Enablers and bottlenecks to research training	Invites the participants to individually share views on the opportunities and constraints to research training considering the international, national and university levels	Reflect and share enablers and bottlenecks to research training e.g. HR, infrastructure, partnerships
Coffee / tea	20		**Coffee / tea break**	

Step	Mins	Content	Facilitator's Activity	Participants' Activity
Sharing Experience: Recruitment and Supervision	10	Enhancing graduate supervision; Selection of graduate students	Presentation of case examples e.g. Irish Universities Quality Board (IUQB), NUI Maynooth PhD research supervisory policy…	Listen and take note, questions / comments in response to the presentation
	30	Challenges to graduate supervision	Invites participants to share what they perceive as key constraints to graduate supervision in their contexts	Share constraints to graduate supervision in their units/ institutions
Conclusion	20	Issues to be taken forward	Summarises emerging issues in relation to the institutional setting, recruitment and supervision (opportunities and constraints). Invites participants to reflect on what can be done for improvement. Workshop evaluation.	Brainstorm on suggestions of what can be done to improve research training in their units or collaboratively. Complete workshop evaluation forms

Module 6: The Role of Information and Communications Technology in Research Capacity Building

FACILITATOR NAME:

WORKSHOP DURATION: 7 hours

TARGET AUDIENCE:
A group of approximately 20 ICT, library, administrative and academic staff

MAIN CONTENT:
Key issues and trends
Developing shared HE networks
e-Learning for research and teaching
ICT supporting research and research-led teaching
Internal ICT Management Issues / Challenges
Digital Repository
Open access repositories and research support systems
Hands-on experience in the development of web-accessible research profiles
Enhanced practical skills and experience in uploading research content into an open access repository

THEME DESCRIPTION:
This module focuses discussion on elements of the ICT infrastructure which are directly relevant to RCB; specifically NRENs, Research Support Systems and Digital Repositories, and finally e-Learning technologies that support research-led teaching. A key theme running through this module is that of collaboration and the need for a cooperative approach both within and among institutions in order to deliver a robust and cost-effective ICT infrastructure.

OVERARCHING GOALS:
An understanding of the wide range of key issues in the provision of effective national HE networks
An understanding of the role of ICT in the promotion of effective teaching and research
Greater understanding of the role of open access [publication]
Hands-on experience in the development of web-accessible research profiles
Enhanced practical skills and experience in uploading research content into an open access repository

LEARNING OBJECTIVES:

Documentation of Issues and challenges surrounding the development of national HE networks

Documentation of issues and challenges surrounding development of e-Learning

Research profiles of participants uploaded to the research register

Content sourced and uploaded to the repository

Plan for further content development for both research register and digital repository among participating institutions

METHODS OF DELIVERY:

Introductory session captures participants' needs and expectations

Interactive approach adapted to meet participants' needs and expectations

Review and feedback at the end of each session

REQUIRED MATERIALS AND RESOURCES

Flip charts; whiteboard; markers; handouts; data projector; participants' CVs and publication lists; writing pads and pens

READING MATERIAL

- All prior reading suggestions sent to participants in advance of the workshop.
- Chan, L, Kirsop, B and Arunachalam, S (2005). Open access archiving: the fast track to building research capacity in developing countries. <www.scidev.net/en/ features/open-access-archiving-the-fast-track-to-building-r.html> Accessed 10 July 2010.
- Grimson, J, Brennan, N, Bruen, C, Murugarren, DL, Ngwira, M, Wade, V and Wella, K (2010). The Role of Information and Communications Technology in Research Capacity Building (Chapter 8 of this volume)
- Harle, J (2010). Digital resources for research: a review of access and use in African universities. An issues paper prepared as part of an ACU study for Arcadia. Association of Commonwealth Universities. <www.acu.ac.uk/publication/download?id=173> Accessed 22 July 2010.
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- Musoke, MGN (2008). Strategies for Addressing the University Library Users' Changing Needs and Practices in Sub-Saharan Africa. *Journal of Academic Librarianship*. 34: 532-538, <www.archive.ifla.org/IV/ifla73/Sat1-Musoke-en.pdf> Accessed 26 July 2010.
- OpCit Project (2010). The effect of open access and downloads ('hits') on citation impact: a bibliography of studies. <www.opcit.eprints.org/oacitation-biblio.html> Last updated: June 2010, Accessed 12 July 2010.

Table 9.6: The Role of Information and Communications Technology in RCB Workshop Procedure

Step	Mins	Content	Facilitator's Activity	Participants' Activity
Start-up	45	Self introduction	Facilitators introduce themselves - name and background, location, current role Summarise expectations	Introduction – name, current role, expectations from module
		Workshop overview: Goals, objectives and ice-breaker	Outline course objectives Outline session objectives Ice-breaker - e.g. uses of a paper-clip	Listen, followed by questions and comments
Topic 1	60	Developing a shared HE network (Ubuntunet and FEAST)	Role of NREN in supporting research (40 min) - NREN models, role and relation to commercial ISP. Distinction between user types. - Services, connectivity, support services and advanced services. Examples: economies of scale, procurement, shared resources, centres of competence. - Structure and Funding. Governance, User and advisory groups. UbuntuNet (20 min)	Listen, followed by discussion, questions and comments

Step	Mins	Content	Facilitator's Activity	Participants' Activity
			- Developments in the region in terms of connectivity. Submarine cables - FEAST and UbuntuNet roadmap - Build up of NREN in the region	
Topic 2	105	Digital Repository Part 1	Formal presentation: Introduction to Research Impact, Open Access and Scholarly Communication (15mins) - The impact of research and publications from African universities - Changes in Scholarly Communications, the benefits to research and role of Open Access to scholarly publications Case Study: Open Access to Research in the host or selected country (45 mins) Open Discussion (20 mins) Brief introduction to the IAP Portal and homework (25 mins)	Listen, followed by questions and comments Study the Paper-based Research Profile (form for completion)
	20		**Coffee / tea break**	
Topic 3	105	Digital Repository Part 2	Making Research Accessible & Maximising Impact: Introducing a Practical workshop - Outline of the workshop (5 mins)Activity 1: Your research profile (15 mins) Example (presenting the parts of the profile) - Activity 2: Completing your profile (online or offline exercise) (30 mins)	Hands-on: Developing a research profile and uploading it online, followed by discussions on how the IAP portal can be utilised by the local institution

Step	Mins	Content	Facilitator's Activity	Participants' Activity
			Discussion and outline of next steps for the IAP Portal (10 mins)	
Topic 4	45	ICT management issues and challenges	Formal presentation	Questions, comments, discussion
Topic 5	30	e-Learning for teaching and research	Formal presentation: Promoting uptake of e-Learning in universities Case Study from Ireland: the National Digital Learning repository (or other example) Case Study from the local institution	Questions, comments, discussion, and sharing experience with e-Learning in own institution/ unit
End	30	Summary and close	Review of topics. Distribution of workshop evaluation forms	Discussion, comments, questions. Complete evaluation forms

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Chan, L, Kirsop, B and Arunachalam, S (2005). Open access archiving: the fast track to building research capacity in developing countries. <www.scidev.net/en/features/open-access-archiving-the-fast-track-to-building-r.html> Accessed 10 July 2010.

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Appendix 1

Chapter 5 - Research Finance - Hypothetical Case Study

EC Programme Collaborative Research Funding

Background information
A consortium of research organisations have agreed to work together to form a collaborative research proposal in response to the EC FP7 call for proposals FP7-PEOPLE-2009-XYZ, the FP7 People Theme. The project title is *HIV-MALAWI-NET: The Antiretroviral roll-out in Malawi: Generating Evidence for Patient Take-up and Adherence*. The project involves collaboration in research over a three year period with eight project beneficiaries who represent collaborating project partners. The beneficiaries on this project are:
- the project co-ordinator – based at the University of Kitzbuehl, Austria
- 5 academic project beneficiaries based at research organisations in five different countries in the European Economic Zone
- the University of Central Malawi participating as a full academic beneficiary
- a commercial organisation that will undertake a project management role. This company is called EuroPro Management Ltd and is registered in France. This company holds full project beneficiary status

Task 1
Identify key administrative issues that you should consider when working with the other project beneficiaries in preparing the collaborative research proposal. Restrict your points to pre-award issues.

Responses re Task 1: Pre-award issues
- Identify all costs relevant to the project and substantiate your approach to costing
- Adhere strictly to EC FP7 Funding Guidelines – ensure that eligible costs are identified and ineligible costs excluded
- Be aware that costs are normally eligible only within the start and end dates of the research project – costs associated with preparing a grant proposal are not usually eligible
- Recognise the substantial work involved in negotiating and agreeing a programme of work among partners – this can be a protracted process and is not funded
- Use robust method for costing and pricing projects. Be aware of difference between funding levels for different activity. Apply evidenced method for calculating overheads
- Be aware of any specific rules for beneficiaries from emerging nations

- Be aware of potential for currency exchange fluctuations and their impacts, as well as national exchange controls or banking arrangements that may affect receipt of grant
- Your university may have to incur costs in advance of grant funding being paid
- Anticipate funding deficits where funds will not be sufficient to cover all costs – ensure that contingencies are in place to bridge funding gaps
- Identify the staff with expertise to participate in the project and avoid obstacles such as issues with work visas and so forth
- Ensure adequate infrastructure for project delivery. Contract Preparation Forms will require university sign-off confirming the resources needed to carry out the project are available
- It is normal practice with EU Framework projects to have formal legal agreements in place. Institutions will probably be required to sign a collaboration agreement
- Need to complete detailed EU Framework contract. Your institution will need to be registered for Framework 7 funding and have a Participant Identity Code
- There is a process of negotiation between the consortium and the EU that often results in a reduction in the level of eligible costs included in the initial grant proposal

Task 2
Identify key administrative issues that you should consider after the award has been agreed and the contract signed with the EC. Restrict your points to post award issues.

Responses re Task 2: Post-award issues
- Costs must be actual, based on documents such as invoices / salary slips available for audit. Allowances for average salary rates must follow EU guidelines
- Be in a position to justify costs incurred as part of the performance of the project
- Costs must be eligible – local taxes, alcohol etc are ineligible – and must be incurred during the life of the project (possible that payments to suppliers take place after the end date but this is acceptable as long as the supplier goods/services were used before the end date); costs may be deemed ineligible after they have been committed – there is a risk that costs are incurred in good faith, but determined retrospectively as ineligible
- Framework Programme grants require detailed and complete timesheets for staff
- Complete financial reports (Form C) are required every 12 months – these financial reports will often have to be accompanied by an audit certificate
- Adoption of cost model i.e. FC, FCF, transitional rate model – this choice dictates the methodology which can be used to claim overheads
- At start-up you will have to nominate a scientist in charge and administrator in charge
- Be aware of the exchange rate risk if a non-euro currency is used
- Be aware of the principle of collective financial responsibility. This will apply if one or more

of the project beneficiaries ceases trading – it may be that any losses to grant funding as a result are shared by all remaining project beneficiaries
- EU funding is subject to substantial administrative burden and deadlines are strict and must be adhered to – if deadlines are missed there is a risk that funding due will be withheld

Appendix 2

Chapter 5 - Research Finance – Hypothetical Case Study Exercise

You have formulated an idea for a one year research project and identified the items and associated costs in the grid below as necessary to undertake the research:

	$
J Bloggs Existing Professor – 10% of their time	100,000
3 return airline trips to Europe	3,000
6 return train fares to attend meeting in Uganda	1,200
A new centrifuge	10,000
Bursary for a PhD student	3,000
A new full-time research assistant dedicated to the project	20,000
A new full-time nurse to assist on the project	10,000
Cleaning costs for facilities (estimate)	6,000
100 diagnostic kits	15,000
Drugs	25,000
Laboratory equipment	15,000
Office consumables	1,500
3 personal computers for staff	3,000
Assistance of Personnel Officer to recruit new staff (estimated)	3,500
Electricity costs for the project (estimated)	16,000
Total	232,200

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Question 1. Take these costs and categorise them under the headings in the grid below:

Cost Category	$
Directly incurred (marginal)	
Sub-total	
Directly Allocated	
Sub-total	
Indirect	
Sub-total	
Total cost	

Question 2. Different research sponsors have different approaches to funding research projects. In this example one sponsor of research has offered to fund the project on a marginal cost basis and another has offered to fund the project on the basis of 75% of all costs. Which funding approach is more advantageous for the University?

Answer

Cost Category	$
Directly incurred (marginal)	
A new full-time research assistant dedicated to the project	20,000
A new full-time nurse to assist on the project	10,000
Bursary for a PhD student	3,000
A new centrifuge	10,000
Laboratory equipment	15,000
3 personal computers for staff	3,000
3 return airline trips to Europe	3,000
6 return train fares to attend meeting in Uganda	1,200
100 diagnostic kits	15,000
Drugs	25,000
Office consumables	1,500
Sub-total	106,700
Directly Allocated	
J Bloggs Existing Professor – 10% of their time	100,000
Sub-total	100,000
Indirect	
Cleaning costs for facilities (estimate)	6,000
Assistance of Personnel Officer to recruit new staff (estimated)	3,500
Electricity costs for the project (estimated)	16,000
Sub-total	25,500
Total cost	232,200

Marginal cost = $ 106,700; Percentage cost (Preferable) = $ 174,150

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