

Research Application Summary

Sandwich Programmes for PhD Studies at the Agriculture - Environment Interface

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Abstract

Many young agricultural and environmental scientists seek employment following their first bachelors' degree. Although they want to further pursue their studies with a Masters and PhD degree, they may be reluctant to do so if required to relinquish their full-time position. The concept of 'sandwich' programmes allows them to enrol in a post-graduate degree while retaining their current position. For this to be a 'win-win' situation for both the employer and the prospective student, they need to carefully negotiate the terms and conditions with both employer and university. Matters that need to be considered include the assignment of tasks, project topic for post-graduate study, residence requirement at the university, as well as credit for outputs and acknowledgement of inputs. Some scholarships are available for African students to pursue their degree overseas. However, the 'south-south' type of scholarships where the student can complete the required degree project in their home country should also be investigated. These programmes exist in many African universities, and have the advantages that the supervisors are more familiar with the situation within Africa than many of those from overseas. Sometimes the disadvantage is that an organisation must effectively hold a vacant post while the student employee completes the degree. Part of the 'win-win' situation is that the organisation provides a local supervisor for such a project which gives added value of experience and international exposure. In addition, the project used for the degree study programme should fit within the long-term vision and goals of the organisation and be seen as a capacity building activity in grooming someone to lead a new programme.

Keywords: Capacity building, distance learning, life-long learning, part-time studies, professional development

Résumé

Beaucoup de jeunes scientifiques dans les domaines agricoles et environnementales cherchent un emploi après leur diplôme de premiers cycles. Bien qu'ils veuillent poursuivre leurs études en maîtrise et en doctorat, ils peuvent être réticents à le faire si nécessaire parce qu'ils

doivent renoncer à leur poste de travail à temps plein. Le concept des programmes «sandwich» leur permet de s'inscrire à un diplôme d'études supérieures tout en conservant leur position actuelle. Pour que cela soit une situation «gagnant-gagnant» pour l'employeur et l'étudiant potentiel, ils ont besoin de négocier attentivement les termes et conditions avec l'employeur et l'université. Les questions qui doivent être examinées comprennent l'attribution des tâches, le thème du projet d'étude postuniversitaire, la condition de résidence à l'université, ainsi que le crédit pour les sorties et la reconnaissance des entrées. Certaines bourses sont offertes aux étudiants africains pour poursuivre leurs études à l'étranger. Cependant, le type de bourses «sud-sud» où l'étudiant peut compléter le projet de diplôme requis dans leur pays d'origine devrait également être étudiée. Ces programmes existent dans de nombreuses universités africaines, et ont les avantages que les superviseurs connaissent mieux la situation en Afrique que beaucoup de ceux de l'étranger. Parfois, l'inconvénient est que l'organisation doit effectivement garder un poste vacant pendant que l'employé étudiant complète ses études. Une partie de la situation «gagnant-gagnant» est que l'organisation fournit un superviseur local pour un tel projet qui donne une valeur ajoutée de l'expérience et de l'exposition internationale. En outre, le projet utilisé pour le programme d'études de niveau devrait correspondre à la vision et aux objectifs de l'organisation à long terme et être considéré comme une activité de renforcement des capacités dans le toilettage de quelqu'un pour diriger un nouveau programme.

Mots clés: renforcement des capacités, apprentissage à distance, apprentissage long de la vie, les études à temps partiel, le développement professionnel

Introduction

A number of young agricultural and environmental science graduates seek full-time employment following their bachelors' degree despite the fact that they may want to further their studies with a Masters and PhD degree. After a few years in the work place they may be reluctant to return to be a full-time student on low stipend, and relinquish their full-time position and salary and so they 'skip PhD' altogether (McCook, 2011). The concept of sandwich programme allows them to enrol in a post-graduate degree while retaining their current position. Probably one of the most well-known sandwich programmes is at Wageningen University and Research Centre (WUR) (www.wur.nl/en.htm) in the Netherlands. Under this type of system a doctoral candidate firstly has orientation in Holland, and then does research in the country of origin, usually followed by another period to write-up the thesis in Holland. Many African PhDs have graduated from WUR under this type of programme, where they are usually jointly supervised by both African and Dutch supervisors (Kropff *et al.*, 2014). In the recent past, this sandwich model has been adopted to reduce the costs of study overseas (Okori, 2014), and so increase the number of students able to study under certain funding schemes. For example, these programmes have been used by BIO-EARN, and Education for African Crop Improvement (EACI) program of the Alliance for a Green Revolution in Africa (AGRA) and at several universities in across Africa. Sandwich programmes usually combine face to face or in person education with a distance learning system as different stages of a programme.

Distance Education (DE) versus Face to Face Education (F2F)

Distance education (DE) usually describes the education process where the instructor is geographically separated or distant from the student, or any other instructional arrangement that requires communication through media other than normal classroom situation. This can be via print or technology such as use of computer-mediated learning technologies, (two-way interactive video; two-way audio; Web-based asynchronous communication), or Internet Web-based instruction (either on- or off-line) systems. Such systems have been developing rapidly with advances in recent technology. Although, most studies on DE have addressed undergraduate studies, there are many post-graduate programmes using these methods. The research usually discusses the differences in study formats, variety of technologies used and the quality of the instruction received. Only some of these aspects are important to post-graduate students. Face to face (F2F) or ‘in-person learning’ is any form of instructional interaction in person and in real time at the same place between teachers and students or among colleagues and peers (Glossary of Education Reform, undated).

Shachar and Neumann (2003) compared DE with F2F systems and found that they are extensively different in numerous ways, technology varies widely, and studies of individual DE courses generally concluded that the learning outcomes are similar to traditional F2F classroom formats. In their study, two thirds of students taking courses by distance education outperformed their student counterparts enrolled in traditionally instructed courses. There was increased accessibility of DE curricula which provides expert training and interactions with educational staff at convenient venues for businesses and professional organizations (Shachar and Neumann, 2003). The implication are that Academic Institutions of Higher learning should be encouraged to invest in DE technology, implement DE learning programs, and transform some existing F2F courses to DE in order to make them available to a wider range of students, regardless of age or geographic location. The inference is also to improve the organisational aspects of professional, training and development programmes by combining internet and other telecommunication options. Students can also choose on merits and quality of a programme, without fear that DE may hinder their academic performance outcomes (Shachar and Neumann, 2003). Therefore DE should be a respectable and feasible option for education.

The level of computer literacy and competency can play a role in the success of DE in Africa. Bolliger and Halupa (2012) found that there was a significant negative correlation between anxiety and student satisfaction in on-line health doctoral education programme. But also that participants who felt anxious when using computers or the Internet, or when taking online courses also experienced anxiety with other domains, so it was not only related to the use of the technology, but perhaps other factors (Bolliger and Halupa, 2012). Other matter also need to be considered in F2F situations where international students are displaced from their home country and other far from their support groups and family. Erichsen and Bolliger (2011) showed that international students, both in traditional and online programmes, experience/perceive high levels of isolation, both academically and socially. They showed that on-line international students feel more isolated than those in F2F situations, and independent variables such as gender, type of degree, and family presence appear to also

have an influence on respondents' answers. Despite experiencing high levels of isolation in US universities they used their own coping strategies to continue with their studies. A sandwich programme could avoid some of this "isolation stress". But it was important to note that actually "on-line" DE students experienced felt more isolated than those in traditional environments (Erichsen and Bolliger, 2011). Therefore, an on-line environment can provide certain benefits; but in their study drawbacks outweighed its advantages and do not concur well with international students' reasons for studying abroad (Erichsen and Bolliger, 2011). These studies appear to indicate that DE and on-line studies are not an automatic success but have their own downsides. This shows the benefit of a blended or mixed-mode learning programme where the student can combine the advantages of F2F and DE such as in a sandwich programme. The other advantages of cost and shorter times away from family and support groups probably help to make it a success also.

Professional Doctorate Programmes

A whole range of types of doctorates have developed in the last few decades, including the Professional Doctorate (PD) or 'new route PhDs' or 'practice doctorates' which have expanded the idea of a PhD programme to include the community of practice and interface with commercial sector. These doctoral programmes still maintain the basic principle of a research PhD that must contribute to knowledge through original research (Nerad, 2011) from a sound basic knowledge of the specific discipline. It appears that this development could have been driven by the quest for practical applications in the real world. The challenges of inter-disciplinary work, including inter-agency projects in specific locations, could also encourage PDs more easily than conventional frameworks of PhDs (Lee *et al.*, 2009).

The growth of PD should be within a framework which links industry, state and academia, particularly within rapid development of the knowledge economy and thus keeps the relevance to societal needs within research training (Lee *et al.*, 2009). As some Australians claim PDs are driven by both economic and intellectual motivations. In the recent past, a wide range of universities and disciplines or fields within universities are developing these opportunities to use PDs to re-invent a more acceptable useful type of doctoral work within the university. In particular, disciplines in the humanities (education, psychology, business, law, journalism, applied linguistics, public communication, etc) and medicine (e.g. tropical medicine, public health, clinical dentistry, physio- and occupational-therapy) have developed PDs at a number of Australian universities.

There are a number of academic issues that need to be addressed in order to maintain the status and rigour within a doctoral type program. These include a theoretical challenge of research in practice; also the changing nature of work in advanced-capitalist countries compared to other countries; and the need for universities to reach and explore relations beyond their boundaries. Therefore, PDs work has been a way to acknowledge that knowledge production can occur in a wide range of places and not only within universities (Lee *et al.*, 2009). Part of the motivation for PDs is a need for application of theory, and a deeper insight into practice in the work place. However, this is accompanied by a frustration with practice of others, and the influence of past 'critical incidents', as well as the attraction

of rising to a challenge to solve the current problems facing industry (Wellington and Sikes, 2006). Therefore the variety and diversity of doctoral students following a ‘professional’ route has important implications for universities development of curriculum, as well as pedagogy and assessment of professional doctorates under a new paradigm in the future. There has been a clear acknowledgement by industry and professional bodies that globalisation forces better connections between knowledge and work. Therefore, the outcome may be that professional doctoral students are more expert, more networked or more resourced to be able to address a wide range of both existing and/or new questions and issues in the real world (Lee *et al.*, 2009).

Models for Doctoral Programmes

From the above discussion, it can be seen that the doctoral programmes should be in a transition or ever changing mode to prepare the graduates for the changing world. The current PhD cannot only be trained to become highly skilled scientists in a particular field of expertise, but they also need to have developed “translational skills” or professional or transferable (US) or ‘soft’ (UK, Australia) skills during their study period. These professional competencies include the ability to communicate and market (McCook, 2011) complex research findings to diverse audiences (as competent writers, speakers); to work in multi-, trans- or interdisciplinary teams (McCook, 2011); to write grant applications; to apply their knowledge and skills in commercially viable and socially responsible ways (Nerad, 2011). They also need to be able to have developed skills to manage people and budgets, and to assume the role of leaders in complex research and commercial organisations and to have multi-cultural competencies to work in multi-national settings (Nerad, 2011).

Under the current globalization of ‘global village’ situation, it is important to have problem solving skills and an ability to look beyond one’s own disciplinary area to see a holistic view of humanity and the world in which we live. As scientists together, we can address issues facing the world by using the current state of knowledge as a foundation or spring-board to take a calculated risk and apply the skills from one discipline into another to develop viable practical solutions. Nerad (2011) describes some alternative conceptual models that doctoral programmes have used as a framework. Firstly, there is the ‘apprenticeship model’ which is based on a one-to-one and often hands-on approach of training the student. Secondly, a ‘professional socialisation model’ where a student make progress from a knowledge consumer to a knowledge producer, or from novice to junior to senior colleague. Thirdly, the ‘community of practice model’ which widens the perspective of learning as a function of an activity, within the context and culture it is situated. Newcomers gradually acquiring knowledge and skills from experts through participating in everyday activities and thus became part of a “community of practice”. Fourthly, a ‘mentoring model’ where guidance is given by a more experienced or more knowledgeable person to a trainee. It is critical that one must have and share a certain area of expertise with the other, in a learning and development partnership between someone with vast experience and someone who wants to learn. This is an individualistic approach and puts the entire burden of the education and preparation on the shoulders of one person, usually called the supervisor or major professor or promoter. Nerad (2011) prefers to see doctoral programmes developed for the ‘global village’ which combine

three sets of skills needed – from a laboratory and/or departmental level in a community of practice approach, with specific technical disciplinary professional competencies; and with a central graduate school (US model), providing professional competencies and multicultural awareness to pass on career development; learning of teaching; and professional skills; as well as intercultural awareness. In addition there must be a coordinated effort beyond the university by the national research and innovation system and the relevant commercial or industrial sector to provide the necessary exposure and community of practice setting to enable capacity building (McCook, 2011). For this to be a ‘win-win’ situation for both the employer and the prospective student, they need to carefully negotiate the terms and conditions with both employer and university. Matters that also need to be considered include: assignment of tasks, project topic for post-graduate study, residence requirement at the university, as well as credit for outputs and acknowledgement and ownership of inputs.

As the doctoral candidate is proceeding through the programme, they must be being trained and prepared for a position of employment and/or leadership in a skilled environment where they can make a contribution to society. So no matter which of the models is used, the outcome should be a person that has in-depth scientific knowledge, skills and competency as well as the social and professional skills to interact smoothly with others and be involved in the relevant sector.

Conclusions

Sandwich doctoral programmes can provide the opportunity for African graduates to benefit from studying at universities around the world. They can take advantage of the benefits of distance and face to face education methods and utilise the modern communication technologies to optimise their learning and personal development. Doctoral programmes should include professional training to balance the technical in-depth scientific research skills learnt, as a preparation for work in the commercial sector. Regardless of which type of model the programme uses, there is a need for innovation policies, education and research training in a problem-solving approach, using multidisciplinary teams, to address real issues in various sectors of society. These programmes exist in many African universities, and need to be further developed to provide capacity building for the agricultural and environmental sectors.

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