Doctoral Education in Context

Perspectives from Africa

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CHAPTER 15

Improving the quality of the PhD programme at the Center of Research and Valorization of Medicinal Plants in Guinea

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Guinea has a population of 14.1 million. The country has 18 public universities. In 2021, a total of 128 doctoral students were enrolled at Guinean universities, 38 doctoral candidates graduated in 2021 and 2022.

The **University Gamal Abdel Nasser de Conakry** (UGANC) became a public university in 1989, tracing its origins to the Institut Polytechnique de Conakry (est. 1962) and the Institut Polytechnique Gamal Abdel Nasser de Conakry (est. 1970). UGANC has 650 academic staff members working in five faculties and two research centres, with a total student enrolment of 4 925 for the academic year 2022, which makes it one of the largest contact-education universities in Guinea. In 2022 UGANC had 56 doctoral candidates and awarded 10 doctoral degrees.

1. Background

For a long time, sub-Saharan countries in Africa have focused on primary and secondary education as the key to development and poverty alleviation (Beaudry et al., 2018; Halvorsen, 2016). Now there is a consensus that Africa needs many more doctorate holders to develop the robust knowledge needed to promote development (Bryman, 2012; Lewin & Stuart, 2003). Human resources for health are a critical element of having a functioning health system and providing universal access to quality healthcare. The doctoral qualification

can be seen as a programme of research, scholarship and advanced study which enables candidates to make a significant contribution to knowledge and practice in their professional context (Maxwell & Kupczyk-Romanczuk, 2009). Thus, promoting the doctorate in health sciences could help sub-Saharan Africa countries to improve their human resources for health.

2. Context and aim

In Guinea, the quality of training in the medical and pharmaceutical sciences is insufficient, this is reflected, as elsewhere in Africa (Fonn et al., 2016), in the performance of health systems (Azevedo, 2017). Research with poorly evaluated capacity and low funding produces results of which very little is translated into decisions and practice (Curtis et al., 2017). As elsewhere in the world, the training for doctors, pharmacists and dentists in Guinea is provided by universities. The Guinean higher education system began its transformation from the classical French education system to the bachelor master doctorate (the *License Master Doctorat* or LMD) system in 2000. To facilitate the migration to the LMD system, in 2005 the authorities at University Gamal Abdel Nasser University of Conakry (UGANC) created an advanced postgraduate programme with two doctoral schools, the Doctoral School of Health, and the Doctoral School of Science and Natural Environment.

To date, the faculties of sciences, social sciences and economics and technical sciences have completed their migration. But the Faculty of Sciences and Techniques of Health has not made the migration to the LMD system.

In 2017, in the Faculty of Sciences and Techniques of Health of UGANC, which trains doctors, pharmacists and dentists, the ratio of all ranks of teaching staff to students was 1:11 (professor, associate professor, assistant professor and assistant), whereas for senior academic staff (professor and associate professor) the ratio was 1:40 (Ministère de l'enseignement supérieur et de la recherche scientifique, 2017). The research carried out within the faculty is done by academic staff for their academic promotion.

The analysis of data on the teaching staff of the Faculté de Medecine Pharmacie Odonto- Stomatologie clearly shows an aging of the teaching staff at the level of the teachers of Rank A and the insufficient succession planning in the field of Pharmacy. Guinea is a member of the African and Malagasy Council of Higher Education (CAMES) and a ministerial decree sets the criteria for recruitment and academic promotion.

According to the Ministry of High Education and Scientific Research decree (N ° 2013/063 / MESRS / CAB, February 1st, 2013) for medicine, pharmacy,

dentistry, veterinary medicine and animal productions candidates, it is necessary to hold a specialized qualification or a master's degree and to be 35 years old at most on 1 January of the year of submission of the application for an academic position. Once appointed, the promotion to the more senior academic ranks (assistant master, lecturer, professor) happens based on the CAMES criteria. In the case of the medical doctors, they can be promoted in terms of the CAMES criteria to more senior academic levels based on the qualification in medicine which they held when they first applied for the academic position. However, for the pharmacists and dentists this is not the case. They must obtain a PhD degree before the end of their period of assistantship to qualify for promotion.

In the Faculty of Sciences and Techniques of Health, studies traditionally last seven years (pharmacy) or eight years (medicine) before students graduate. After the completing academic training, the student must complete at least two years (pharmacy) or four years (medicine) before obtaining a diploma allowing them to be appointed as an assistant at the Faculty of Health Sciences and Techniques of UGANC. For pharmacists, after their appointment as an assistant they must obtain a doctoral degree if they wish to continue their academic career. PhD opportunities for pharmacists are very low in Guinea and only the Center for Research and Development of Medicinal Plants (CRVPM) at UGANC offers such opportunity.

The Center of Research and Valorization of Medicinal Plants (CRVPM) is a public research center based in Dubreka, 50km from UGANC. The CRVPM is a public scientific institution under the supervision of the Minister of Higher Education and Scientific Research. Its financial resources come mainly from the national development budget.

Currently, the centre itself does not have a specific doctoral programme but accepts PhD students enrolled at UGANC and other partner universities into its research programme. Since its creation in March 2001, more than ten PhD candidates have received PhD degrees from the UGANC based on the research that they have done at the CRVPM. The objective of this chapter is to critically analyse the CRVPM doctoral programme and to make recommendations to improve its quality.

3. Evaluation of PhDs completed at the CRVPM

Since 2005, the CRVPM has co-supervised 7 doctoral students enrolled in an international scholarship programme with Belgium universities and the University of Gamal Abdel Nasser of Conakry, and 8 doctoral students enrolled

in doctoral programmes of Guinean higher education institutions. Of these 15 PhD students, 6 are currently pharmacists with positions in the Pharmacy Department of the FSTS. Three pharmacists have obtained their PhDs. The average duration for graduation varies from one candidate to another and can range from 5 to 7 years. During my time as a PhD student at ULB Belgium (2005–2010), I observed that two PhD students dropped out, leaving 10 active students by 2010.

We evaluate the CRVPM programme according to Cross and Backhouse's model for evaluation of doctoral programmes in Africa which takes into account six elements, namely: the interest of the candidate, the context of the candidate, the prerequisites of the candidate, the structuring of the programme, the human, material and financial resources, and finally institutional partnerships (Cross & Backhouse, 2014).

3.1 The interest of the candidates

In focus group discussions with the PhD students (conducted specifically to gather data for this study), it emerged that the candidates' interests were not always aligned with that of their institutions of origin. Some candidates were enrolled for PhDs because they wanted to pursue an academic career, and they were aware that the PhD is essential for an academic career. Other candidates registered for the PhD primarily based on their research interests and because the PhD qualification attests to their status as researchers and links them more to the category teacher-researcher.

Based on its rector's leadership, an institution will either provide support to their academic staff enrolled in a PhD programme or not. If they view staff members' enrolment in a PhD program as an opportunity to enhance the quality of academic staff and prepare for the rejuvenation of their faculty, they provide support to the candidates. On the other hand, due to poor availability of resources for research, some institutions in Guinea do not support the PhD candidates.

Whether or not their institution of origin had an interest in their staff obtaining a PhD, most doctoral students remain motivated to complete their PhD studies, as is indicated by the low dropout rate (2/15) of this programme.

However, it appears that the candidates do not have a broader view of all the opportunities offered by a PhD for an academic career. Consequently, neither their institutions nor their disciplines, and still less their profession, fully benefit from the advanced research skills and knowledge they gain when they graduate.

3.2 The context of the candidate

PhD students hosted at the CRVPM are usually already employed by a higher education institution. They usually have at least a first degree either from the Faculty of Science of Julius Nyerere University of Kankan (UJNK) in Guinea or from the Department of Pharmacy in the Faculty of Science and Techniques of Health of UGANC. Regardless of their first degree, all the PhD candidates hosted by the CRVPM hold a Diplome d'Etude Approfondie in phytotherapy and medicinal plants. This is a diploma offered in terms of a collaboration agreement between the CRVPM, the FSTS of the UGANC and the Faculty of Sciences of the UJNK. With some exceptions at the time of their enrolment for the doctorate, the candidates are at least 35 years old and already have a family life. One of the challenges faced by the PhD candidates is that their educational institution is not in the same city as the CRVPM, the institution that hosts them for their PhD. They are therefore obliged in many cases to interrupt their research activities at the CRVPM for a period of 3 to 6 months every year to meet their teaching obligations at their home university. This situation has an impact on the progress of their doctoral work and is often a source of stress for doctoral students who feel they are not progressing with the recurring question: 'When will I be able to do my research and complete my thesis?'

3.3 Candidate's prerequisites

When they enroll, PhD students already have a basic knowledge of the study of medicinal plants, and they are familiar with the CRVPM's research programmes and strategies. But the students accepted for the PhD programme do not have a research topic when they enroll.

Order No. 2007/3474 / MENRS / CAB regulating advanced studies (2nd and 3rd Cycle) in Guinea in September 2007 requires the submission of a research project to the Admission and Evaluation Subcommittee, and knowledge of the English language validated by a certificate. This administrative requirement does not seem to be respected in practice if we consider that doctoral students hosted at the CRVPM participate in the programmes of the CRVPM.

3.4 The structuring of the programme

The decree N ° 2007/3474 / MENRS / CAB regulating advanced studies (2nd and 3rd Cycle) in Guinea of September 2007 sets the total value of PhD credits at 180. Participation in a seminar or conference counts for a minimum of 18

credits, while examination a doctoral degree is worth at least 12 credits. The thesis counts for a minimum value of 120 credits. The authority hosting PhD candidates has the responsibility to decide on the definition and the distribution of the 180 credits constituting the doctorate.

From my focus group discussions with the PhD students, it became clear that, in the case of the CRVPM, no detail is communicated by the responsible authorities to the PhD candidates about the credit structure and the requirements for the examination of the thesis. It is therefore possible that candidates can receive permission to defend their thesis as soon as the first scientific article is published. However, for some candidates, the defence of their thesis was permitted only after the publication of the third scientific article.

At the CRVPM the thesis is supervised by a thesis director only and there is no supervision committee. Consequently, the university of origin does not follow the progress of the doctoral student, and the doctoral student is not subjected to an annual evaluation. The uniqueness of the CRVPM's programmes is that they are all focused on medicinal plants. The big problem for PhD students integrating these programmes is that not all of them are able to do their PhD research in the field in which they have completed their first degree. The presence of a supervising committee would have allowed each candidate to be a specialist in natural substances but in their specific field. The current situation has the consequence that the CRVPM and the home university do not take full advantage of their doctoral candidates.

3.5 Human, material, and financial resources

The scientific staff of the CRPVM consists of 31 researchers (25 men and 6 women): 10 PhD holders including one CAMES professor and two CAMES associate professors, 9 master's degree holders, and 22 university degree holders. The scientific staff include pharmacists, biologists, medical doctors, chemists, botanists, agronomists, zootechnicians, veterinarians, and soil scientists. All the PhD students hosted at the CRVPM are supervised by a professor. The CRVPM has 4 laboratories specifically equipped for the extraction, separation, and isolation of natural substances of plant origin. The equipment includes items such as grinders, scales, Soxhlet extractors, rotary evaporators, microscopes, chromatography equipment and accessories, an oven, and a capsule-making machine. Biological activities are carried out by partner laboratories.

3.6 Institutional partnerships

The CRVPM is located at national level which allows the development of partnerships with institutions of higher education (UGANC, UJNK), with the pharmaceutical industry (AMB Pharma), and with an NGO (Foundation for the fight against diabetes and non-communicable diseases) of traditional healers.

Internationally, the CRVPM has partnerships with the University of Bamako (Mali), the National Institute of Public Health of Bamako (Mali), the University of Antwerp (Belgium), the Institute of Tropical Medicine (Antwerp, Belgium), Université Libre de Bruxelles (Belgium), University of Liège (Belgium), University of Angers (France), University of Toulouse (France), and the Michel Iderne group of Strasbourg (France).

PhD students hosted at the CRVPM benefit greatly from the CRVPM's international partnerships. The biological analyses of the plants studied are carried out in the laboratories of these institutions, which also host PhD students, either for internships or as part of co- supervision scholarship programmes.

The dissertation is the final product required for the PhD in the CRVPM programme. But the award quality is not internally uniform within, and it is urgent to establish clear guidelines to improve this programme. Also, consideing the state of the global economy, there is a need to facilitate the integration of the PhD holder not only in academia, but PhD students also have to acquire more transferable 'soft skills', like courses in computing, management, presentation techniques (Maybee et al., 2019).

4. Recommendations to improve the quality of PhD programme at CRVPM

PhD curricula structure: The CRVPM PhD programme is a PhD by publication and according to the LMD system in Guinea, the PhD programme consists of one hundred eighty credits (180 ECTs). To standardise the criteria for the PhD, it is important to define how each doctoral student achieves the 180 credits. The research activities of the CRVPM are all related to a student participating in compulsory workshops (with certificates) on the following topics:

1. Training workshop in documentary research
2. Training workshop in research methodology
3. Training workshop in scientific redaction
4. Training workshop in grant application
5. Training workshop in leadership and communication
6. Training workshop in management

Given the importance of English as international academic language, it is also recommended that PhD candidates obtain an intermediate-level English certificate by the end of their second year of enrolment. These six certificates, along with the English certification, should collectively account for sixty credits (60 ECTS). In the modern international job market, holding a PhD is valuable not only for academic roles but also for a variety of positions and careers beyond academia (Ortega & Kent, 2018)

Like in many other countries where ability to publish is a major criterion for doctoral level studies (Badley, 2009), it is recommended that PhD candidates hosted by the CRVPM must be required to publish their own research before they present their dissertation. I propose that the PhD thesis should contain two or more peer-reviewed academic papers, published or accepted for publication. Each article published in a peer-reviewed journal can amount to 20 credits (20 ECTs), written and presented dissertation also earn twenty credits (20 ECTs), Thus, the two original scientific articles and dissertation presentation justify sixty credits (60 ECTs).

To facilitate PhD student progression, a doctoral research committee must be constituted for each candidate. This committee should have the responsibility of guiding the student through the dissertation process and to conduct the final oral defence. The research committee must comprise of at least four members. Two must be from the university of the student and among these one should be a specialist in the field under study to direct the dissertation. The two other members should be CRVPM staff, among which one should be the dissertation director. Adhering to these recommendations will better align current practices of the CRVPM with international best practices for examining PhD theses, emphasizing the importance of data quality and methodology as key criteria for thesis evaluation (Joyner, 2003; Holbrook et al., 2004; Tewari, 2012; Bourke & Holbrook, 2013). Each year of the programme, the PhD students should present a report of their activity to their doctoral research committee. Depending on the PhD programme duration, a student must present at least three reports to their committee by the end of programme. These three reports would net the PhD student forty-five credits (45 ECTs). To begin the construction of the identity of researcher, during their training, the doctoral students would have to present their work at an international congress of their specialties. This presentation would earn them fifteen credits (15 ECTs), thus completing the 180 ECTs required to obtain the PhD.

Table 1: Mandatory PhD programme activities

No.	Mandatory activities	Quantity	Credits
1	Workshops	6	60
2	Annually report	3	45
3	Participation to international congress	1	15
4	Articles published or accepted	2	40
5	Redaction and dissertation presentation	1	20
	Total		180

This structured programme could help the CRVPM and the candidates to better define the objectives of research learning, develop learning activities and evaluate the gains from this learning. However, it is recommended that two other weaknesses observed during the evaluation of the programme also be attended to:

- *Mobility and research identity*: Indeed, the process of introducing PhD candidates at the CRVMP into a community of scientists in his field is currently not optimal. As mobility is an element for the acquisition and qualification of skills, the programme must grant the doctoral student at least one semester to spend in other institutions outside Guinea for their research. Here, the adage *Chercheurs qui cherchent, on en trouve. Chercheurs qui trouvent, on en cherche* rings true (it can be loosely translated as, "*Researchers who are searching, we find them. Researchers who are finding, we are searching for them*"). It reflects the importance of the visibility of a researcher. And this visibility is facilitated largely through scientific publications and communication. The specification of a research theme and the researcher's regular publications on this research theme will enhance the visibility of the researcher. It is therefore important in the interest of the doctoral candidate to be integrated into the community of scientists in their field. To facilitate the mobility of PhD students, the CRVPM will have to strengthen its institutional partnerships.
- *Institutional partnerships:* The institutional partnerships of the CRVPM with (UGANC, UJNK), the pharmaceutical industry (AMB Pharma), and the Foundation for the fight against diabetes and non-communicable diseases of traditional healers mainly offer collaborations in the context of refilling activities but do not promote the transfer of skills. Except those who are in a sandwich fellowship programme, PhD students typically ship their work material to the partner and wait for the results. Not staying at the partnership institutions themselves, they do not acquire practical skills and do not benefit from any transfer of skills and technology. The

universities of origin of its doctoral students will have to offer study travel grants for the mobility of doctoral students and the transfer of skills.

5. Conclusion

For a training of trainers qualification in the health sciences, the doctorate is of obvious interest. The CRVPM, which hosts doctoral students in the health field must, however, better structure its PhD programme to ensure a certain level of quality for the students. But in the absence of funding and not very encouraging prospects in this regard, fewer candidates for certain basic disciplines come forward. The will of the authorities and the availability of funding are two essential conditions to improve the training of doctorates in our institutions.

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