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Building Sustainable Collaborations and Academic Networks in Low Income Countries: Case of Master Programmes

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Abstract. During development of health information systems, local specialists were needed to take the local lead and train others. Through external funding, nine master programmes in health information systems were set up in developing countries in collaborations between a local university and the University of Oslo. While development efforts tend to fade out after initial project funds have been spent, keeping the programmes running was crucial for the upkeep also of the health information systems.

Their planning, running with external funds and continuation has been analysed by means of a Collaborative Governance Model, which was made more specific through literature on higher education. The specifics concerned initial planning, where bringing in relevant stakeholders, include local knowledge, network globally and have an interdisciplinary approach to learning were confirmed. During the implementation with project funding, small wins kept the collaboration going, and face-to-face dialogues for common problem definition helped solving emerging issues. The outcome has been that all nine programmes continue running, and local, regional and international collaboration help keeping the academics flourishing. More than 500 master students have graduated.

Keywords: Higher Education, Collaboration, Health informatics

1 Introduction

Collaborative postgraduate programmes have become popular over the years, enhancing both higher education internationalization and north-south collaborations. Some of the collaborative have succeeded and culminated into fully-fledged programmes, whilst others have failed [1]. This paper presents empirical findings on how sustainability was achieved with collaborative postgraduate programmes between the north (Norway) and the south universities in six developing countries (Ethiopia, Malawi, Mozambique, Tanzania, South Africa and Sri Lanka) where programmes were implemented in the fields of Health Information Systems/Informatics and Public Health.

Health Information Systems are key in developing countries context as they support local management of health care delivery and information flows in health facilities. To ensure that proper support is given, capacity building through research and Masters Programmes is required. The Health Information System Programme (HISP) at the University of Oslo has been engaged in supporting the health information systems in developing countries for two decades in order to strengthen their health systems and their capacity to govern their Health Information Systems in a sustainable way to improve the management and delivery of health services (HISP, 2014). One necessary component has been educating health informatics specialists, which is a scarce resource [2] in the developing countries. In addition to in-service training, research education was deemed necessary in order to groom specialists who could take on central positions in the development and train others.

The traditional view of universities is buildings, expensive labs, courses and lecturers. These were the foundation for attracting students who paid their tuition and generating the income. In the developing countries where the Health Informatics has been implemented, the traditional view applies and they had no Masters Programme in informatics. University of Oslo has contributed in establishing 9 master programmes in health information systems in low and middle income countries (see Fig. 1).

Master Programmes

2001-2009	2007-2014
University of Western Cape	University of Dar Es Salaam
1. Public health	4. Health informatics
Eduardo Mondlane University	Addis Ababa University
2. Public health	5. Health informatics
University of Oslo and Eduardo Mondlane University	Gondar University
3. Informatics	6. Public health
	University of Malawi
	7. Public health
	8. Informatics
	Colombo University
	9. Public health



Fig. 1. Master programmes

The Health Informatics Master's Program was prompted by the Call for Master programmes by the Norwegian Centre for International Cooperation in Education [3] in the year 2000. Demands for information across the health sector within countries influenced the choice of area to become health information systems. The Norwegian Centre for International Cooperation in Education funded the establishment of the

program the first 5-8 years. In the first phase (2001–2009) establishments started in two countries – Mozambique and South Africa, with a total of three programs. In Mozambique, two Master’s programs were established one for Public Health, fully run by Eduardo Mondlane University and the other Informatics jointly run by Eduardo Mondlane University and University of Oslo. In South Africa, one program (Public Health) was introduced with the University of Western Cape. The core aim of these establishments was building capacity by building local competence to run the programmes. As such, these establishments did not go for the expensive computer lab.

In the second phase (2007-2014), four countries (Tanzania, Ethiopia, Malawi and Sri Lanka) with a total of six programmes. In Tanzania, one program in Health Informatics was established with University of Dar Es Salaam; in Ethiopia two programmes were established - Health Informatics Programme with Addis Ababa University and Public Health Programme with Gondar University. In Malawi, two programmes – Public Health and Health Informatics were introduced, both with university of Malawi. In Sri Lanka, one programme in Public Health was introduced with Colombo University.

Research has revealed that north–south postgraduate programme collaborations do not always take a smooth ride. Challenges encountered include: lack of internationally recognized accreditation system in the south countries, inconsistent administration and management, poor communication due difference in reporting structure, difference in legal systems, lack of funds, difficult to recruitments students and differences in official language [4].

While running projects is normally feasible due to accompanying funding, activities have a tendency of dying out after initial funding has ceased, and this pilotitis has affected ICT in health in particular [5]. The question this paper will address is how the host university can continue running the master programmes after support from University of Oslo withdraws.

2 Literature Review

This section draws experiences from other collaborations, explaining why different partners venture into collaborations. Further, it reviews recommendations from existing frameworks which highlight important issues that have to be taken into account in the collaboration development phase.

The collaboration in this research is of the ‘interorganizational problem domain’ [6] type, involving Master Programme collaboration across different institutions and countries. The question - how is the Master Programme project collaborated and sustained in the participating institutions/countries is asked. The question focuses on collaboration and sustainability within institutions as entities of interest. This collaboration has taken place between public institutions, hence a theory addressing public-public collaboration would be preferred.

The closest we could find was a theory based on a review of 137 public-private collaborations [7], see Fig. 1. This theory identifies critical variables and factors that influence successful collaboration through *collaborative governance*. The variables

include prior history of conflict or cooperation, incentives for stakeholders to participate, power and resources imbalances, leadership, and institutional design. The factors include face-to-face dialogue, trust building, and the development of commitment and shared understanding (ibid.).

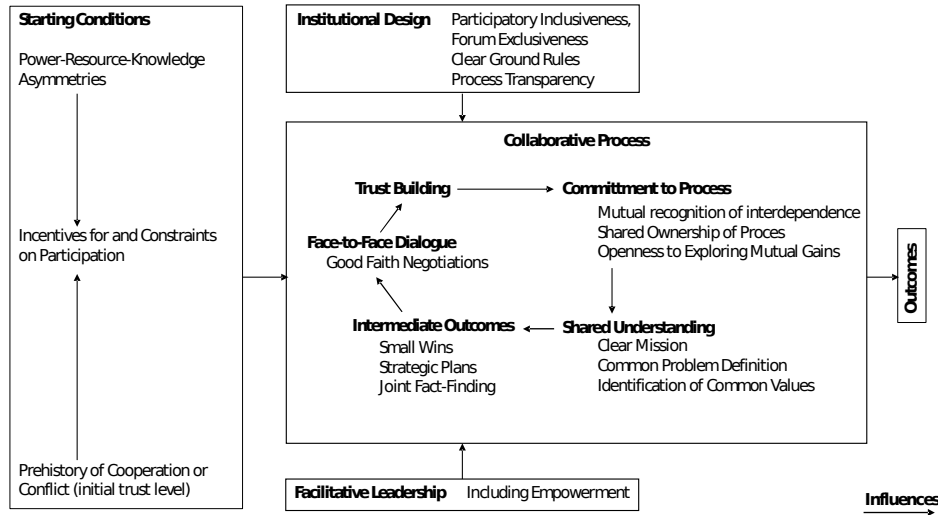


Fig. 1. Collaborative Governance Model [7]

Collaborative governance “brings multiple stakeholders together in common forums with public agencies to engage in consensus-oriented decision making” [7]. Ansell and Gash [7] argue that trends toward collaboration also arise from the growth of knowledge and institutional capacity; with demand for collaboration increasing as knowledge becomes increasingly specialized and distributed. The term “stakeholder” is used to refer to the participation of citizens as individuals, organized groups, and to both public agencies and non-state stakeholders (ibid.). A virtuous cycle of collaboration between stakeholders develops when the focus of the collaboration is on “small wins” that deepen trust, commitment, and shared understanding.

There is also research more closely related to our cases, including transnational knowledge sharing in the public sector. In a literature review, [8] point to various contextual distances influencing the collaboration; cultural, political, intentional, organizational, relational, knowledge, resources, physical and technical, and that much of the work in transnational collaboration consists of bridging or shrinking these distances. Ansell and Gash [7] includes knowledge and resources asymmetries in their theory, hence these distances will be investigated in our cases.

Concerning intentional distances, the European Consortium for Accreditation [9] has identified the main reasons for higher education institutions to develop joint programmes; indicated in table 1. These fall under the Incentives category of [7].

Table 1. Reasons for joint programmes in higher education.

Institutional	Programme	Academics	Students
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-
- raise the international visibility;
 - increase global student recruitment;
 - raise institutional revenue;
 - deepen and institutionalise cooperation;
 - build networks of excellence.
- internationalise d curriculum;
 - strengthening partnerships with other regions;
 - improve the quality of the curriculum (and of research);
 - increase cross-cultural competencies;
 - improve graduate employability;
 - international visibility and prestige;
 - strengthens funding from other sources;
 - access to expertise of a partner institution and its research networks.
- opportunities to learn about other contexts and teaching and learning methods;
 - student diversity in the classroom;
 - networks for future collaboration;
 - research contacts;
 - professional development opportunities;
 - inter-cultural competences.
- international jointly developed curriculum;
 - automatic recognition of the period spent abroad;
 - joint programme has expertise of more than one institution
 - 'two degrees for the price of one;
 - no time loss or risk that credits are not accepted.

In addition to the reasons cited in table 1 above, there are other benefits that calls for collaboration. A survey of a Swiss-funded research programme indicate that north-south collaborations has helped more than 90% of alumni to stay in global south after attaining their PhD [10]. This is a clear and very important benefit that help to curb brain-drain from the south. Further, the survey established that the north-south postgraduate programmes give opportunities to students from low socioeconomic backgrounds. People from these backgrounds are more likely to understand development challenges on the ground, and conduct research that benefits and incorporates perspective of the poor (ibid.). These specific reasons will be included in our analysis.

According to the European Consortium for Accreditation, institutional commitment is necessary for developing educational collaborations [9, 11] and ensures institutional support. In addition to the incentives mentioned above, the collaboration must be in line with participating institution's strategy and internationalisation policy. High-level institutional strategies are not identified as

important by [7], who rather point to the need for collaborative strategies for governing the collaboration.

There is also need to jointly define the need for the programme, the learning outcomes and length of the programme and jointly develop the curricula [9]. This resonates with the imperative from [7] that participation must be sought in the design of the rules for collaboration.

Braa, Monteiro [12] addressed sustainability of action research within the Health Information Systems Programme, in which the master programmes constitute one type of actions. The idea is that the nodes in the network learn from each other. This would require including global partners in the Institutional Design. Further, the educational component is supporting the national health information systems through educating specialists and having master theses contribute to its development, thus the education is made relevant through working with actual systems in the public sector. The relevance requires participation of the national Ministry of Health, thus they need to participate as a stakeholder in the Institutional Design.

In his study of higher education in Zambia, Kantini [13] found that if universities were to support development in the country, they should network globally, have local community engagement, include local knowledge, have an interdisciplinary approach to learning, and use inventive technological applications. Networking reflects the global partners also from [12], and local community engagement may require including local partners in health and IT, including the Ministry of Health. Interdisciplinary approach to learning should be in the Ground Rules of Institutional Design, and inventive technological applications are part of the Resources in the Starting Conditions of [7].

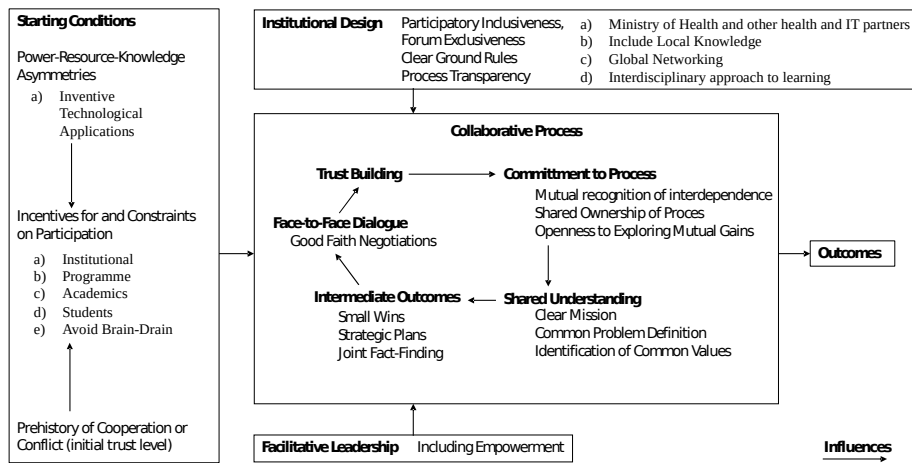


Fig. 1. Adapted Collaborative Governance Model. Additions in Serif font.

Fig. 1 illustrates the Collaborative Governance Model with additions from the other relevant literature.

3 Methodology

The research applied a combination of approaches that include reflection/reflectivity, participant observation, document analysis, and consultative interviews with experts in some of the universities participating in the collaboration. The focus countries for primary data collection were Malawi, Norway and Tanzania, whereas secondary data was sort from the other four countries where the Masters programmes were implemented (Ethiopia, Mozambique, South Africa and Sri Lanka). To assess sustainability of a project, there is need to have the project running for a number of years and observe how it survives beyond project funding. This is exactly what happened in the case of the Masters Programme project, the study took place a few years after project closure. However, the study necessitated the use of data and information that existed when the project was active; hence the use of reflectivity and document analysis methods. As argued by Malterud [14], the angle of investigation chosen by a researcher and the methods judged most adequate may be affected by his/her background. In this study, the researchers have a background of being participants in the project. Since the researcher is the primary “instrument” of data collection and analysis, reflexivity is deemed essential [15]. Research has shown that through reflection, researchers become aware of what allows them to see [15]

The researchers in this study have been involved in the project from inception to implementation. Reflectivity is therefore used to review the processes of which they had been a participant, reflecting on their contributions to the process. Reflexivity in itself is an attitude of attending systematically to the context of knowledge construction, especially to the effect of the researcher, at every step of the research process.

A second method used in this study was observation, as a participant observer. This include observations made as an implementer of the project within an institution in the south, how buy-in (from the institution, potential students and faculty members) was achieved and as an initiator and sponsor from the north. These observations are analysed and discussed.

Further, document analysis was used, use of documentation from all the six countries was used to gain an understanding of the contexts in which the Masters Programmes were conceived, planned, implemented and nurtured. The documentation used was in the form of minutes, reports, presentations, photos and reflection from management meetings. To verify some of the facts from reflections and document analysis, consultative interviews with experts were held. This gave an opportunity to develop a complete understanding of the phenomena.

4 Implementation Approach

Each master programme development has gone through three phases. While the Collaborative Governance Model (theory terms Capitalized) conceives the world as conditions → Process → Outcomes, the initial phase of the master programmes contributed to establishing the conditions which the model categorises as Institutional design. Thus

Phase 1, which was planning and application for funds, is a process of establishing the conditions for the Collaborative Process. During Phase 2, the implementation of the master programme with project funding constituted the Collaborative Process. The Outcome is defined as the running of the programmes after project closure, and in this case, the Outcome is a process as well, hence process phases 1, 2 and 3.

The prehistory of cooperation was good or neutral. UiO had more resources and knowledge than the partner universities, hence an asymmetry existed.

4.1 Phase 1. Planning and application for funds – Institutional Design

During Phase 1, plans were made for the academic contents and relevant partners were included in the planning, including the national Ministries of Health. A number of thesis supervisors were recruited from local organisations to reduce the burden of the faculty members and to broaden the scope of topics. Thus, point a) under Institutional Design was fulfilled.

A strategy was devised to have lecturers from UiO and other partners teaching and supervising in the programmes together with local lecturers at the start of phase 2 and phasing out the international support when the local lecturers could take over. Some lecturers from the partner universities would at the same time be enrolled in PhD studies at UiO to build their capacity. These were important parts of the Ground Rules for the cooperation.

The initial funding covered salaries for partner university staff, scholarships for 4-8 students per cohort and running costs, including UiO staff travels. The partner universities needed 15-20 tuition fee paying students per cohort for sustainable funding in Phase 3. To achieve sufficient number of applicants, the partner universities had a deliberate strategy where they announced the programmes with tuition fees from the start of the project. The approach used was to enroll two sets of students: those funded by the project and self-sponsored students. There is no obvious category in the Adapted Collaborative Governance model which corresponds to this income strategy.

4.2 Phase 2. Implementation with project funding – The Collaborative Process

The number of applicants were around twice the number of scholarships, hence the universities received additional income from the start of Phase 2. This constituted the first Small Win during the implementation.

Getting courses up and running constituted the second Small Win. These two achievements strengthened the mutual commitment. The lecturers related the course contents to health services or other businesses like IT industry when appropriate. Also the student theses concerned local affairs.

The plan to co-teach courses such that local lecturers could take over also worked to a large extent. Some teaching was also carried out by lecturers from the region. In some instances, the locals were not up to it, and these course modules were thus abandoned in Phase 3.

While large parts of the curricula concerned health and informatics, also other subjects like organizational science, psychology, educational science and statistics were also included, hence the master programmes are interdisciplinary. Also lecturers from informatics, health and social sciences were brought into the teaching and supervision of master students.

Educating local lecturers to PhD was a necessary element in the plan. Many of the local lecturers became overburdened by both trying to teach in the master programme whilst doing their own PhD. Since teaching is a short horizon activity, this was often prioritized, and the PhD was consequently delayed. In this case, the Small Wins took prominence over the final outcome. Fortunately, UiO could extend their PhD scholarship until they completed, hence each of the 17 lecturers who graduated as PhDs constitutes a Small Win for the Collaborative Process.

Many students had problems completing their master theses. Completion time extended in some cases up to four years and a significant portion of the students only end up with a diploma confirming their coursework. Through Face-to-Face Dialogues, the Common Problem Definition reached was that nearly all students enrolled in Malawi and Tanzania work full time, and have immediate and extended families take care of. Coursework force most of them into a structured setting such that they pass their exams. Finding time needed for concentrating on thesis writing has been difficult and impossible for some students.

One way of improving completion has been to organize one week thesis workshops where the students work intensively, discuss with each other and with supervisors. Additional retreats are organized for female students as they have more burden and less time to work at home. This has sparked some dormant students to resume their thesis work, hence some Small Wins.

4.3 Phase 3. Continuation without external funding – Outcome

The students and graduates spread information about the programmes through word of mouth, and this has secured the number of fee paying students after the initial funding ceased.

All programmes have three or more lecturers with PhDs, out of whom a total of 17 have graduated from University of Oslo, with two more in the pipeline. This has secured the academic basis of the programmes. UiO staff have contributed in supervising a few master students of mutual interest in Stage 3.

UiO and four of the programmes have recently received renewed funding from SIU [3], this time for student exchange. This has enabled master students who have completed their data collection to get 2-3 months of scholarship and bring them to UiO for writing up. Getting away from their obligations at home for concentrated work at UiO has worked successfully. Other outcomes are listed below.

Internal development team strengthening. Master students and graduates have been offered technical positions in the universities, carrying out development work for local partners. For example, the University of Dar es Salaam (UDSM) currently has a group of 15 technicians working with development work for the Tanzania Ministry of Health and local development partners. UiO has for more than a decade devel-

oped software for health information systems called DHIS2. The project staff at UDSM have become the strongest DHIS2 development group outside of UiO.

UiO research students. More than 50 Master and PhD students from UiO have done field work for their theses with local supervisors from the collaborating universities. E.g. seven master and one PhD student carried out experiments in Malawi in 2017, involving three local supervisors, all with PhDs from UiO.

Local collaborations. Staff at local industry, government and NGOs have enrolled in the programme, opening for collaboration. E.g., students at University of Malawi are working in the Ministry, easing R&D from the university in the national health information system and enabling project funding from UNICEF into the university.

Regional cooperation. Some lecturers from other universities with master programmes have taught in the universities in the region. While this exchange stopped after initial funding ceased, R&D collaboration is still ongoing.

International collaboration. The strong ties between UiO and the master programme universities have enabled other funding for joint R&D, and this has taken place for all partner universities. Funders include EU, Norwegian Research Council, Research Council of South Africa, NORAD, The Global Fund to Fight AIDS, Tuberculosis and Malaria, The President's Emergency Plan For AIDS Relief, UNICEF, Bill and Melinda Gates Foundation.

5 Discussion and Conclusion

The Collaborative Governance Model for Collaboration [7] was taken as a starting point for analyzing collaborations for master programmes. Its structure Conditions → Collaborative Process → Outcomes matched the sequence of phases 1) Planning and application for funding 2) Implementation with project funding and 3) Continuation without external funding. The overall structure of the theoretical model thus corresponded well with the phenomenon studied.

Some aspects of the model were particularly useful for characterizing the master programmes development; Participatory Inclusiveness, Ground Rules, Face-to-Face Dialogue, Common Problem Definitions and Small Wins. The model helps developing an Institutional Design for academic collaboration.

Additional literature was brought in to improve the relevance of the model. The starting conditions was asymmetric resource and knowledge, and one goal of the collaboration was to contribute to levelling the unbalance. Kantini [13], who addresses the role of universities in Africa for development, recommends inventive technology application to ease the asymmetry, but the programmes reported here did not apply inventive technology for the implementation and running of the programmes. Distant, electronic communication was used when appropriate, but achieving Shared Understanding required Face-to-Face dialogues, as indicated in the Collaborative Governance Model.

Kantini [13] further emphasizes the need to bring in local stakeholders (Institutional Design a) and relate university education to their knowledge (b). This was carried out through courses and theses. Global networking (c) was primarily through the

contact between the local university and the University of Oslo, since this was the channel of funding. In addition to some lecturers from the region, research and development projects from other funders have contributed to building and keeping the global network. Interdisciplinary approach to learning (d) is a fourth component of the Institutional Design, and these master programmes were probably more interdisciplinary than most others.

These recommendations from [13] aligns with [12], hence we put these forward as necessary component in Institutional Design for university collaboration for development.

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