Embedded learning within international research partnerships to strengthen research systems

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International research partnerships are frequently used as a platform for strengthening research systems but often fail to use their experiences to learn how any impacts were achieved and sustained. Embedding 'learning' programmes within international research partnerships can derive and apply practical lessons to improve research capacity strengthening practice and outcomes for individuals, organisations and (inter)nationally systems [1] within and beyond the lifetime of the partnership.

> Research capacity strengthening (RCS) has been defined as "enhancing the capacity of individuals and organisations to conduct, manage, share and apply research, while enabling national and sub-national research systems to effectively support research and the linkages between research and practice" [2].

The Centre for Capacity Research (CCR), Liverpool School of Tropical Medicine, specialises in the science of strengthening the capacity of research systems. The centre is a global leader in:

- Conducting high quality, implementation focused capacity strengthening research
- Fostering a global community of capacity strengthening scientists with equitable low- and middle-income country participation
- Sharing learning and advocating for evidence-informed capacity strengthening practice

CCR have successfully employed a diverse range of embedded learning programmes within multiple large-scale international research partnerships over the past decade. Here we present two examples, comparing their distinct features and highlighting key strengths of each. We illustrate how such embedded learning programmes can be implemented in practice and how they can be effective accelerators for generating knowledge on RCS investments.

[1] Dean L, Gregorius S, Bates I, et al. Advancing the science of health research capacity strengthening in low-income and middle-income countries: a scoping review of the published literature, 2000-2016. *BMJ Open* 2017;7(12):e018718. doi: 10.1136/bmjopen-2017-018718

[2] ESSENCE on Health Research and CCR (2023) Effective Research Capacity Strengthening: A Quick Guide for Funders.

Example 1 - The DELTAS Africa Learning Research Programme

DELTAS Africa was launched in 2015 to expand excellent science research and leadership across Africa. In its first five-years approximately US$100 million supported 11 research consortia, each focused on different research priorities of Africa's health sector. Embedded in DELTAs Africa was a Learning Research Programme (LRP) operationalised by CCR through three African PhD students based at different African research institutions and a post-doctoral research assistant based in Liverpool. At the outset, the DELTAS Africa awardees and leadership team identified four thematic areas for the embedded learning programme:

1. Equitable career pathways for researchers
2. Effective knowledge translation
3. Improving research consortium management
4. Improved access to skills training for researchers

As DELTAS Africa's 54 institutions implemented their research projects, the LRP collected data from across consortia on all four themes. As new learning on good practices and clear evidence of effective strategies emerged, these were shared with all the DELTAS Africa consortia via personal communications, quarterly updates and participation in consortia and programme decision-making meetings. This enabled DELTAS Africa programme leaders and consortia members to adapt and adjust their projects and practices within the programme's lifetime. At the same time, these lessons and ideas were communicated to the wider research community via peer-reviewed journals, seminars and conferences, reports and Good Practice Guides for funders and researchers, and on social media and YouTube. A key strength of this approach was the robustness of the evidence produced, the engagement and ownership by programme participants, and the corresponding contribution to the scientific literature (12 peer reviewed publications so far).

Example 2 - Africa Capacity Building Initiative Learning Programme

The Royal Society-DFID Africa Capacity Building Initiative (ACBI) was established in 2013 to strengthen the research capacity of 26 universities and research institutions in sub-Saharan Africa through PhD studentships, training and mentoring, and supporting sustainable research and laboratory networks. The ACBI learning programme was led by a postdoctoral research fellow based at CCR working closely with the awardees, PhD students, the programme management team and the funders. Focal learning areas were designed to address gaps identified in a baseline study. This study used a 'benchmark' to describe the optimal capacity needed by the programme's African institutions' for post-graduate training and science research.

Although there were significant differences across the ACBI-associated institutions, common priorities for the learning programme to focus on were agreed. These were to explore factors that positively and negatively influenced:

- The students' PhD experience and the benefits (or otherwise) of belonging to a large multi-disciplinary research consortium
- The capacity of institutions' laboratories to support science research and how being part of the consortium influenced this capacity

The need for strengthening of laboratory capacity had not been included in the original programme design but became a key focus following the baseline study. The learning from the ACBI programme was regularly shared within and beyond the programme using similar approaches to those described for the DELTAS Africa example.

Overall reflections

Similarly to the DELTAS Africa LRP, CCR's research into ACBI's priority learning areas drew on the experiences and practices of the ACBI consortia members. However, in ACBI the postdoctoral research fellow was able to collect and report data more quickly and flexibly, and to adjust the research focus, whereas in DELTAS Africa there was less flexibility as the learning areas were delivered with a formal PhD structure. The ability to be adaptable and responsive to programme's needs was considered a key strength of the ACBI approach.

Whist there were key differences in these two approaches to embedded learning, especially regarding how focal learning areas were determined, staffing structure and flexibility in research focus, there were also common features essential to their success. These included: CCR researchers with sole responsibility for learning-based research working collaboratively with all those involved in the consortium and programme leaders; a position on programme-level management forums where emerging learning could be discussed and acted on; diverse, rapid and frequent reporting of learning outcomes; and independence from the programme activities and deliverables of each participating institution/consortium, yet clearly defined and visible membership of each partnership.

For further information about CCR, please visit www.lstmed.ac.uk/ccr