Title: Evaluation of the implementation of a PhD capacity-building programme for nurses in South Africa.

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Table 1 Findings on the evidence of implementation enablers across the stages of implementation

Enablers/ Barriers	Stages of Implementation			
Enablers	**Stage 1 Exploring and Preparing**	**Stage 2 Planning and Resourcing**	**Stage 3 Implementation and Operation**	**Stage 4 Business as usual**
Stakeholder consultation and buy in	Consultation with key stakeholders (NRF, DENOSA, FUNDISA, DoH) and a purposive sample of Irish Nursing Sciences academics in Ireland (IAP members).	Initial meeting of SANRUST management team and Irish Nursing academics (TCD, DCU) and IAP members; Meetings between SANTRUST and funders (NRF, Irish Aid); Briefing session with SANTRUST facilitators in Ireland and SA.	On-going consultation with key stakeholders including: doctoral candidates and graduates, facilitators and supervisors ('stakeholder-in-action' group), Irish academics and IAP members, and facilitators at existing sites of implementation.	On-going consultation with funders and key stakeholders; Feedback from 'stakeholder-in-action' group'.
Leadership	Experienced CEO and an Academic Programme Manager led implementation.	Leadership by engaged Trustees including the CEO and Academic Programme Manager.	On-going leadership by CEO and Academic Programme Manager.	
Resources	Support by SANPAD and existing SANTRUST programme; Funding proposal developed for Irish Aid; Support from Irish Aid and NRF given in principle.	Funding secured for pilot stage from Irish AID for 2012-2013; CFO hired and financial and logistical support outsourced; National and international academics recruited to deliver programme.	Additional funding secured for 2013-2014; Evaluation Committee set up to select doctoral candidates against Call Criteria; A 2nd Programme Manager was appointed; Constraints in obtaining co-financing from universities.	The final Cohort became fully funded without co-financing from universities, due to savings on previous programmes, but this is unlikely to be repeated.
Implementation Teams		Implementation team drawn from existing SANTRUST staff including an Academic Manager, Academic Co-ordinator, a Project Support Worker and financial administrative support.	Implementation team expanded to include new co-ordinating and administration staff.	Implementation team continues as usual.
Implementation Plan		No formal implementation plan.	No formal implementation plan.	No formal implementation plan.
Staff capacity		Programme staff recruited according to the skills and needs for the operation of the programme; All facilitators selected	A PhD Supervisors module was embedded to build supervisory capacity but has not been well attended; Candidates take learning back	Candidates continue to take their learning back to their organisations and faculties.

		were vetted for appropriate skill and experience mix.	to their organisations and faculties and apply double-loop learning.	
Organisational support		Supportive systems, policies and procedures put in place within SANTRUST, a lean organisation with a small Board of Governors.	The CEO, Academic Manager, and key administrator operate as a single team to facilitate regular two-way support.
Supportive organisational culture		No evidence available.	No evidence available.	No evidence available.
Communication		Briefing sessions with IAP and Deans/Directors of Research and Heads of Nursing Schools of all public Universities of SA.	Academic Programme Manager and key administrative staff attend international planning meetings with CEO; Academic Programme Manager 'sits in' on all academic modules to enable feedback loops.
Monitoring and evaluation			Written feedback obtained from candidates, facilitators, supervisors and reviewers after every module (reviewed by Evaluation Committee); Internal monitoring against strategy during staff meetings.	Standard practice of modular reporting continues.
Learning from experience			Attritions analysed and additional efforts made to support candidates to complete at a later date.	Set of recommendations developed for future implementation on basis of learning identified in 2012/13 progress report.

Abbreviations: CFO=Chief Financial Officer; DENOSA= Democratic Nurses Association of South Africa; DCU=Dublin City University; DoH=Department of Health, South Africa; FUNDISA=The Department of Health, Forum of University Nursing Deans of South Africa; IAP=Irish African Partnership for Research Capacity Building; NRF=National Research Foundation, South Africa; SA=South Africa; SANPAD= The South Africa Netherlands research Programme on Alternatives in Development; TCD=Trinity College Dublin.

Table 2 Findings on the evidence of implementation barriers across the stages of implementation

Barriers	Stage 1 Exploring and Preparing	Stage 2 Planning and Resourcing	Stage 3 Implementation and Operation	Stage 4 Business as usual
External environment	Many Masters Candidates not adequately prepared for programme as most do not complete research Masters.	Difficulties in attracting applicants; Call for Applications need longer lead times and for each Call, the deadline is extended.	PhD Candidate attrition due to external family and work commitments – 7/41 PhD candidates in 2012/13 did not defend the PhD proposal; Constraints in universities releasing the staff to attend as Candidates; Candidates are mostly part-time and manage multiple roles.	Pipe-line of Masters candidates is limited and there is a possibility of reaching saturation point in numbers who are ready for the programme.
Resistance to change and vested interests	Muted response from the DoH: engagements were at a superficial level.	Resistance from universities to send Candidates as some universities reflected that they can prepare Candidates without external support.	Supervisors have low attendance rate at supervisors' module and often express resistance to the Candidates' diversified learning; Candidates resist changing their research ideas to address theoretical and knowledge gaps rather than choosing topics on the basis of interest or daily work.	Candidates and Supervisors often take new ideas and skills into organisations and Faculties that can be challenging; No expression of interest from DoH to upscale SANTRUST to a nationally-owned programme driven by the DoH.

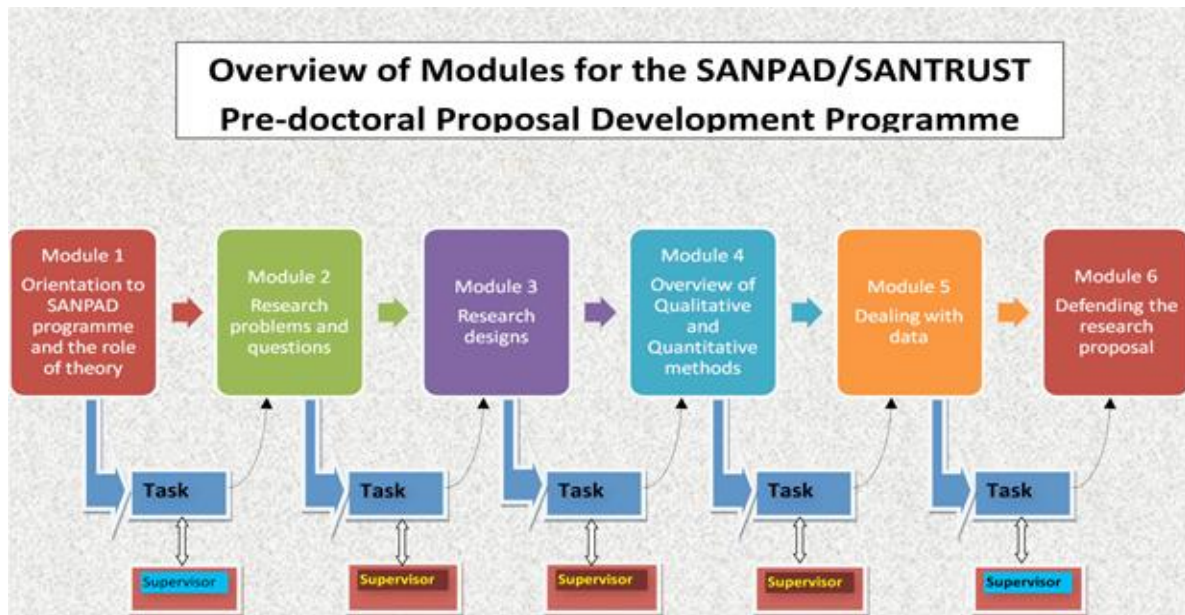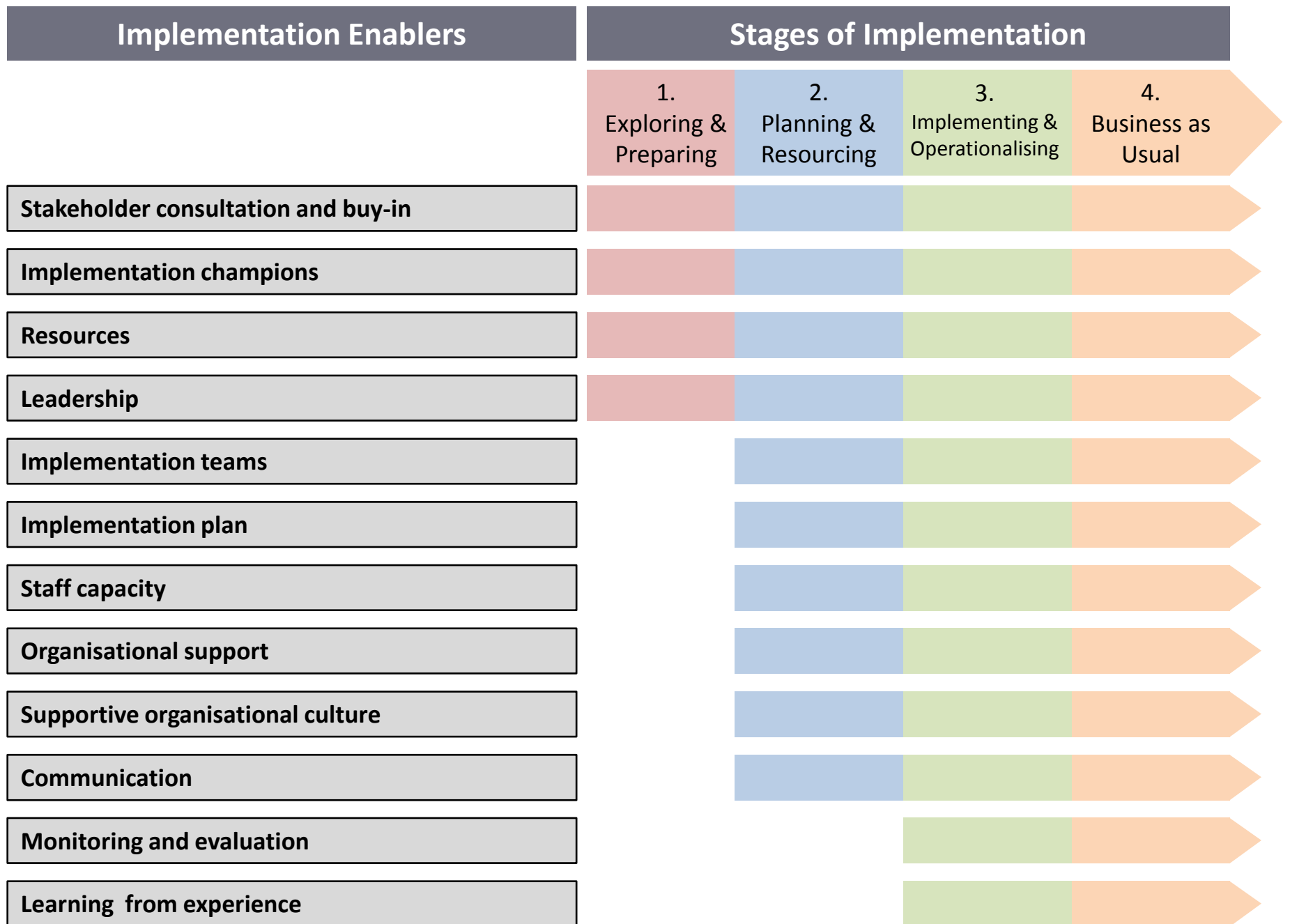Abbreviation: DoH=Department of Health, South Africa

Figure

Figure 1 Modules for SANTRUST Pre-doctoral Proposal Development Programme

Figure 2

Implementation Enablers	Stages of Implementation			
	1. Exploring & Preparing	2. Planning & Resourcing	3. Implementing & Operationalising	4. Business as Usual
Stakeholder consultation and buy-in	■	■	■	■
Implementation champions	■	■	■	■
Resources	■	■	■	■
Leadership	■	■	■	■
Implementation teams		■	■	■
Implementation plan		■	■	■
Staff capacity		■	■	■
Organisational support		■	■	■
Supportive organisational culture		■	■	■
Communication		■	■	■
Monitoring and evaluation			■	■
Learning from experience			■	■

Abstract

Background: There is a significant deficit in the research capacity of nurses and internationally, in order to meet future healthcare demands, there is a call to double the number of nurses and healthcare professionals with a PhD.

Aim: The aim of this research was to evaluate the implementation of a national PhD capacity-building programme for academic and practice-based nurses and other healthcare professionals.

Method: An implementation science framework was used to evaluate the process of implementing a national PhD capacity-building programme across South Africa. Implementation of the programme across two national, longitudinal cohorts of participants was studied. Evidence of enablers and barriers to implementation was obtained from a range of data sources. These sources included the curriculum for the programme, regular evaluation reports from programme participants and programme facilitators after each stage of the PhD curriculum delivery, and meeting notes. Supplementary sources included measureable and quantifiable impact metric rates on PhD candidate recruitment, retention and successful completion.

Results: Evidence of the presence of most enablers for successful implementation was found, including stakeholder consultation and buy-in, leadership, resources, staff capacity and implementation teams. There was, however, no evidence of an implementation plan, a supportive organisational culture or of effective ongoing communication at stage four of the implementation process. Evidence was found for the presence of the barriers of external environmental factors, resistance to change, and vested interests.

Discussion: Within the context of a recognised worldwide shortage of nursing scientists, the application of an implementation science framework to evaluate the initial stages of a

national PhD development programme roll-out provided evidence on how the effective

implementation of the programme can be strengthened and how barriers to success can be

overcome.

1 **Introduction**

2 Worldwide, there is a deficit in research capacity in Nursing Sciences, particularly in lower-

3 and middle-income countries (Edwards, Webber, Mill, Kahwa, & Roelofs, 2009; Sitthi-amorn

4 & Somrongthong, 2000). Strategies and initiatives to build research capacity are therefore

5 being developed with the aims of enhancing nurses' engagement with research activities,

6 increasing the implementation of evidence-based practice leading to better quality of care,

7 and enhancing nurses' participation in decision-making on health systems and policy

8 (Segrott, McIvor, & Green, 2006; Sitthi-amorn & Somrongthong, 2000). One such initiative is

9 the SANTRUST doctoral education programme in South Africa, a national capacity-building

10 education programme for academic and practice-based nurses and other healthcare

11 professionals. The purpose of this study was to evaluate the implementation of the

12 SANTRUST doctoral programme to identify enablers and barriers to its implementation.

13

14 **Situational Analysis**

15 In 1994, South Africa underwent a fundamental change in its nationhood in terms of

16 ideology, ethos, government, economy, and citizenship. The contours of the country

17 reflected huge unevenness and racial inequalities that had been constructed and

18 perpetuated by the apartheid state. Sophisticated sites of urbanisation and privatised public

19 services were juxtaposed with massively under-resourced and ill-conceived service delivery

20 points, and attendant systemic structural poverty (Hendricks, 2003). South Africa has since

21 undergone a rapid and complex health transition. The inter-generational conditions

22 inherited by the transforming nation have resulted in varied experiences, which in turn

23 represent differing points along a continuum of success to failure.

24

1   While there have been huge strides towards delivering equitable health services and scaling

2   up health service delivery (Schneider, Barron, & Fonn, 2007), the period has also seen

3   epidemic levels of infectious diseases, a growing prevalence of non-communicable diseases,

4   and unprecedented violence and injury (Coovadia, Jewkes, Barron, Sanders, & McIntyre,

5   2009; Kahn, 2011; Mayosi et al., 2012; Seedat, Van Niekerk, Jewkes, Suffla, & Ratele, 2009).

6   Worsening rates of access to health care and the year on year increase in those affected by

7   HIV and AIDS point to a progressively more challenging health care context. Between 1990

8   and 2005, mortality worsened across all age groups, primarily due to HIV and AIDS (Tollman

9   et al., 2008) and there is now approximately 3.5 million people living with HIV and AIDS

10   (Global Health Observatory, 2012). This is in spite of it having one of the highest gross

11   domestic product (GDPs) in the southern hemisphere (International Monetary Fund, 2013).

12

13   While noting the plethora of progressive policy and legislation in the democratic South

14   Africa, there have also been policy trade-off decisions, with a serious decline in investment

15   in clinical research activity and capacity since the 1990s (Gevers, 2009). This choice has been

16   made against a broader scoped statistic of South Africa graduating only 23 PhD graduates

17   per year per million of the population. This rate of graduation falls far short of the number

18   of doctoral graduates required to support a competitive knowledge-based economy (Smit,

19   Williamson, & Padayachee, 2013). The 2009 Lancet Health in South Africa Series emphasised

20   the importance of "widespread scale up of successful innovations and relevant and rigorous

21   clinical research" (Kleinert & Horton, 2009). There is a disparity between the increasing

22   disease and health burden and the research capacity required for evidence-based decision-

23   making, strategy, and policy (Nchinda, 2002).

24

1   Research capacity in Nursing Sciences is particularly poor. In 2010, out of the 971 Masters

2   students registered for nursing research programmes across South Africa, only 121 had

3   graduated as of 2011 (SANTRUST, 2013). This represents an unacceptably low 12.4%

4   completion rate. There is acknowledgement that nurses are generally underprepared to

5   take on higher-level education and it is here where learner support interventions are

6   needed. In addition, there has been a staffing crisis due to a number of factors including the

7   migration of nurses to jobs abroad, attrition due to retirement and HIV and AIDS, and the

8   closing of nursing colleges in the 1990s, which is threatening the quality and standards of

9   healthcare (Coovadia, et al., 2009). Shortages in nursing personnel have been specifically

10   identified within leadership roles and it is here where academic capacity-building is most

11   indicated.

12

13   The future of health care provision is explicitly dependent on the existence of expert nurses

14   who will oversee the curative, preventative and health promotion priorities that are

15   centrally critical to recent health policy (SA Department of Health, 2013). Their engagement

16   in research also plays an important role in the strengthening of evidence-based healthcare

17   practice and policy. Investment in health research and development has a high payoff in

18   health status and economic productivity (Nchinda, 2002). Cognisant of these issues, the

19   Department of Health has prioritised the strengthening of research and development in its

20   ten-point plan for 2009-2014 (Mayosi, et al., 2012). The South African government has also

21   specifically identified a need for an unparalleled support of the promotion and maintenance

22   of high quality and nursing education and training. In 2011, the SA Nursing Compact and

23   Roadmap was devised and launched (National Nursing Summit, 2011). This Compact and

24   Roadmap evolved into the National Strategic Plan for Nursing Education, Training and

1   Practice (Department of Health, 2013), aimed at reconstructing and revitalising the nursing

2   profession as part of the department's efforts to improve health outcomes.

3

4   **Collaborative Role-Players**

5   Within this broader-based context of the challenges and opportunities presented by the

6   doctoral and health demographics in South Africa, role-players in Higher Education have

7   generated responses so as to address this vulnerability. One such response, the PhD

8   Proposal Development Programme for Nursing Sciences, has emerged from a collaborative

9   international knowledge network that includes Doctoral Candidates of Nursing Sciences,

10 Supervisors/Promoters, Universities, Development Partners and an implementing

11 organisation, SANTRUST, which is an educational trust that has been active in doctoral

12 education and capacity development since 1997 (Smit, et al., 2013). The Programme's

13 primary focus is on the research proposal phase during the first year of doctoral education

14 as this has been shown by many, including Pryjmachuk et al. (2009), as the time of greatest

15 risk of attrition in the doctoral journey.

16

17 Building from a history of harnessing international knowledge networks towards achieving

18 alternatives for development (Hoebink, Vvan der Lans, & Padayachee, 20013), SANTRUST

19 set out to bring together role-players in order to explore a niche programme for Nursing

20 Sciences. Combining its model of PhD Proposal Development, which exists as a multi-

21 disciplinary programme that deepens the rigour of proposal development for doctoral

22 studies (http://santrust.org.za), SANTRUST re-crafted the curriculum to address Nursing

23 Science scholarship. Parallel to this burgeoning curriculum and after a visit to the various

24 Nursing Faculties in the Republic of Ireland, SANTRUST found receptive partners who had

1 gone through their own trajectory of growing Nursing Sciences. The Irish-Africa Partnership

2 that was also already working with SANTRUST on other development projects was keen to

3 support this Irish-Africa initiative. SANTRUST then proposed to Irish Aid to fund the first ever

4 PhD Proposal Development Programme for Nursing Science and secured funding for the first

5 pilot, which has since continued for a further two deliveries (Comiskey, Matthews, Bruce,

6 Klopper, & Mulaudzi, 2013).

7

8 Through consultation with the National Research Foundation of South Africa, SANTRUST

9 was able to secure funds matching those contributed by Irish Aid so that the programme

10 would have co-financing from its own government funds. These extra funds allowed for

11 more candidates to benefit from the programme, as well as strategically positioning the

12 programme with a significant research partner whose mandate is to build knowledge capital

13 in response to national priorities. The twenty-three Universities of South Africa subscribed

14 to the programme and supported candidates to attend the Programme, together with their

15 supervisors. Additionally, the Department of Health, Forum of University Nursing Deans of

16 South Africa (FUNDISA) and Democratic Nurses Association of SA (DENOSA) expressed

17 support and gave inputs for the programme (Comiskey, et al., 2013). As such, SANTRUST,

18 was again able to use its existing experience around "what works in a transforming

19 education context" in order to "offer… incremental models of excellence [that] need to be

20 built through combining international knowledge with local knowledge in contextually-

21 appropriate ways." (Smit, et al., 2013).

22

23 **Towards Operationalising the PhD Proposal Development Programme of SANTRUST**

1   SANTRUST aimed to produce and retain a new generation of researchers, facilitate high

2   level human capacity development, and reposition African universities as contributors to the

3   global knowledge economy (Smit, et al., 2013). The SANTRUST model consisted of a six-

4   module research methodology and PhD Proposal Development Programme, delivered in

5   weekly blocks over an academic year. This programme for Nursing Sciences was facilitated

6   by internationally recognised academics from Irish and South African universities and

7   operated a triangular model in which the candidate, supervisor and facilitator work

8   together, on the research process, towards completion of the PhD proposal. Following

9   proposal completion, supervisors and candidates work towards thesis development and

10 graduation, with SANTRUST tracking progression toward completion for all members of the

11 cohorts. Figure 1 depicts the modular flow and the proposal development process.

12

13 **Figure 1** About here

14

15 The expected outcomes of the SANTRUST programme were: increased high level (PhD)

16 human capacity in the critical research field of nursing; enhanced capacity of universities to

17 supervise post-graduate students in Nursing; increased research and innovation output

18 within the Nursing Sciences; increased number of trained supervisors at doctoral level;

19 substantial subsidy income to the graduating University with implications for academic and

20 financial sustainability; and enhanced capacity for global competitiveness and innovation

21 with Nursing Schools (Comiskey, et al., 2013). Smit et al (2013), in a case study of the

22 SANTRUST PhD programme, and how it evolved from an international aid programme to a

23 model of educational innovation, highlighted that the programme was under-theorised and

24 in need of further study.

1 **Research Capacity-Building in Nursing Sciences**

2 The need to develop research capacity in Nursing Sciences is not unique to South Africa,

3 rather is a global challenge. Various initiatives have been developed and implemented

4 across the globe to address this including graduate and post-graduate training, mentoring

5 strategies, building research infrastructure, creating a supportive research culture and

6 environment, and building collaborative links between academic institutions (Edwards, et

7 al., 2009; Segrott, et al., 2006). For example, the Council for the Advancement of Nursing

8 Science has developed an Idea Festival for Nursing Science Education in the US (The Council

9 for the Advancement of Nursing Science, n.d.), through which nurse scientists and PhD

10 students can discuss the future of Nursing Sciences.

11

12 In the international capacity-building literature, graduate and post-graduate training is a key

13 way in which research capacity is built and through which nurses can develop the

14 knowledge and skills to engage in research, compete for funding, and implement evidence-

15 informed practice. However, the need to evaluate educational interventions within the

16 nursing profession has long been recognised (Ellenbecker, 2010). In their editorial on the

17 urgency of the goal to double the number of graduate nurses with doctorates by the year

18 2020, Nickitas and Feeg (2011) stress the importance of the need to gather more data on

19 doctoral graduates and the outputs after graduation. However, relatively little attention has

20 been paid to the effective *implementation* of capacity-building initiatives.

21

22 Implementation can be defined as "coordinated change at system, organisation,

23 programme, and practice levels … [and] efforts to improve the science and practice of

24 implementation have the potential for positive broad scale impacts on human services,

1 across service systems" (Fixsen, Naoom, Blase, Friedman, & Wallace, 2005, p. vi). Mounting

2 evidence demonstrates how implementation influences the outcomes achieved by

3 programmes, and assessing the implementation of programmes and initiatives enables the

4 examination of what worked well, what was challenging, and where improvements are

5 needed. While the importance of the application of theory and evidence from

6 implementation science to evidence-based nursing practice has been emphasised (Van

7 Achterberg, Schoonhoven, & Grol, 2008), the application of implementation science

8 frameworks to the evaluation of capacity-building initiatives in Nursing Sciences has not

9 been previously considered.

10

11 A body of research on factors, which facilitate and hinder successful implementation of

12 programmes, has emerged in recent years. However, there is currently no definitive theory

13 of implementation or single implementation framework commonly accepted in the field.

14 Burke, Morris and McGarrigle (2012) developed an implementation framework based on a

15 review of key historical developments in implementation science, from Presman and

16 Wildasky (1973) to Meyers, Durlak and Wandersman (2012), and identified common key

17 components across these models, in particular, the models of Fixen et al. (2005) and

18 Wandersman et al. (2008). These include leadership, resources, supportive organisational

19 culture, and staff capacity.

20

21 There are evidently gaps in the literature on research capacity-building in Nursing Sciences

22 and this study sought to evaluate the implementation of one such initiative in South Africa,

23 the SANTRUST programme, in order to identify strengths and challenges to the

24 implementation process, and inform the development of such capacity-building

1   programmes. The aims were (a) to determine the activities that occurred at each stage of

2   the implementation process; (b) to identify enablers of the implementation process across

3   these stages; and (c) to identity barriers of the implementation process at each stage.

4

5   **Methodology**

6   **Implementation Framework**

7   To evaluate the implementation of the SANTRUST programme, the implementation

8   framework of Burke et al. (2012) was utilised. This model was chosen as it provides a

9   framework for evaluating the implementation of a programme or service across time and

10   stage of the process. The framework is based on a set of eleven enablers and three barriers

11   across four stages of implementation, these being: 1) exploring and preparing; 2) planning

12   and resourcing; 3) implementation and operational; and 4) business as usual. It is important

13   to note that these stages are not necessarily sequential and linear; rather the process of

14   implementation is iterative and stages of implementation intersect over time.

15

16   The first stage of exploring and preparing involves the development of the programme to be

17   implemented, which typically involves establishing the needs of those affected by the

18   programme and scoping the practicalities and feasibility of implementing it. Consultation

19   with key stakeholders and the identification of champions to support and drive the

20   programme are critical steps during this phase to foster a supportive climate for

21   implementation. Once a plan for implementing the programme has been developed, the

22   second stage of planning and resources is the development of a comprehensive

23   implementation plan including a clear delivery model and assigned responsibilities. The

24   stage entails ensuring the necessary capacity and resources are available for

1   implementation, which may involve securing funding and the hiring and training of staff. The

2   third stage of implementation and operationalisation commences once the programme has

3   begun. It encompasses continuous monitoring, communication and creating feedback

4   mechanisms to inform the development of the programme. On-going communication and

5   monitoring provide opportunities to inform future organisational and policy decisions.

6   Throughout these stages, various factors can contribute to the success of implementation,

7   the importance of which depends on the specific application and context. Figure 2 presents

8   the enablers operating at each stage of implementation.

9

10   **Figure 2 Implementation stages and enablers (Burke, et al., 2012) about here**

11

12   The first three enablers of stakeholder consultation and buy-in, leadership, and resources

13   operate across all four stages of implementation. The existence of implementation teams,

14   an implementation plan, adequate staff capacity, organisational support, a supportive

15   organisational culture, and communication are enablers which operate across the second,

16   third and fourth stages of implementation. The final two enablers relevant to phases three

17   and four of implementation, are monitoring and evaluation, and learning from experience.

18   According to Burke et al. (2012), barriers to implementation are grouped under three

19   classes: the external environment, resistance to change, and vested interests.

20

21   **Participants**

22   Participants included 55 students who participated in the programme over two cohorts

23   from admission to completion of the programme (commencing in 2011 and 2012),

24   programme facilitators, and programme staff.

1

Data Sources

A range of data sources were accessed including the funding proposal, the Curriculum for

the programme used extensively by the facilitators, regular evaluation reports from

programme participants and programme facilitators after each stage of the curriculum

delivery, meeting notes, and finally, measureable and quantifiable impact metrics on PhD

candidate retention rates and successful completion rates.

Ethical approval

Ethical approval was not sought as the data sources were all widely available and the

summaries of the evaluation reports from candidates and facilitators were distributed to all

the relevant stakeholders. Notwithstanding the fact that ethical approval was not required

as an explicit stage of this research, all ethical standards for protecting human subjects have

been followed in accordance with standards of the institution's committee for the

protection of human subjects where the study was conducted and the Helsinki Declaration

of 1975. In addition, the methodological norm for ethical research was followed (Tracy,

2010). This included respectful and responsible treatment of data, mutual and self-

reflection during the research process, which continued into the reporting on findings in a

transparent, honest manner, which is open to peer-review and public scrutiny. Described by

Tracy (2010) as "situational" and "relational" ethics, the researchers considered the specific

contexts of this research setting, interacted with participants (who knew and understood

that the programmes were evaluated for both programme and research purposes) in a

sensitive and connected manner, and carefully weighed up the potential and actual

responses to the research through in person and on-line discussions.

1

2 **Data Analysis**

3 A deductive approach to the data analysis was adopted to map the content of the data

4 sources onto the implementation framework. A retrospective mapping of the process of

5 implementation of the SANTRUST PhD proposal development programme against each

6 enabler and barrier within the implementation framework was conducted. Data

7 triangulation, the continual process of collecting, consolidation and cross-checking of

8 information from a range of sources, was used to synthesise all the data accessed in order

9 to identify activities under each stage of implementation, enablers of implementation across

10 the stages, and barriers to the implementation process.

11

12 Rigor within the data analysis was ensured in several ways. Firstly the analysis of the data

13 was undertaken as an iterative, collaborative process by the two international members of

14 the research team, a senior and a non-senior researcher, both of whom had undertaken

15 training in implementation science, and one of whom had over 25 years' experience of

16 delivering PhD research education in national and international settings. Once the initial

17 analysis was completed, it was reviewed by the national South African members of the

18 team, also consisting of a more senior and less senior team member. Any gaps or

19 inconsistencies in the mapping of the data to the framework were clarified with the national

20 members who were more familiar with the data and when gaps were identified, additional

21 data was sought and mapped to the framework as appropriate. Any additional findings were

22 then sent to the national team for review and feedback. The research process therefore

23 involved on-going discussions and assessments by the respective national and international

24 teams. Approximately five work sessions were necessary to complete and reach consensus

1 on the data mapping by the international team and both members were present for each

2 session and worked collaboratively.

3

4 Tracy (2010) highlights criteria beyond 'rigor' for excellent (qualitative) research. She

5 indicates that there should be sincerity and credibility within the research itself and the

6 research process. Credibility is provided in terms of "member reflection" and "triangulation

7 or crystallization". Sincerity is achieved through self -reflection, and surfacing biases and

8 implicit value systems. During both the data gathering and data analysis stage, the national

9 and international teams spoke worriedly, happily, explicitly and reflexively about the

10 emerging findings and used the theoretical framework as the scaffold against which findings

11 could be explored and examined. Where the national members recorded feeling too close

12 to the data and influenced by insider bias, the international members were able to create

13 spaces for distance and perspectives by providing a more global view of the findings and to

14 bring it back to the central theoretical constructs of the framework. It is also important to

15 note that the international team led the data analysis and were responsible for the

16 generation of the final results in the interest of rigor, sincerity and credibility as noted

17 above.

18

19   **Results**

20 **Enablers to the Implementation Process**

21 Table 1 provides the results of the retrospective mapping process and illustrates the

22 activities associated with each implementation enabler at the four stages of

23 implementation. Evidence on the presence of many implementation enablers at relevant

24 stages of implementation was found, including regular consultation with stakeholders, the

1   attainment of significant funding to enable implementation, and a close-knit

2   implementation team with strong leadership and good communication. The existence of

3   connected, strong leadership was likely to have been a key driver of buy-in and funding. This

4   leadership provided direction and vision for all stages of the implementation of the

5   programme, in conjunction with an experienced Academic Programme Manager. Buy-in was

6   maintained through regular briefing sessions and the dissemination of quarterly or biannual

7   reports to funders. Supportive organisational structures and an implementation team with

8   good communication mechanisms with staff and stakeholders also drove implementation.

9

10   SANTRUST was able to replicate a pilot for two further iterations of the programme, based

11   on the organisation's and funding partners' continued belief that the programme was

12   delivering value to a particular niche of the doctoral landscape in response to current and

13   future policy requirements. This achievement may be due to the leadership and

14   management being able to leverage existing networks in order to achieve the multiplier

15   effects that are sought in developmental projects. The existence of an earlier fifteen-year

16   programme, delivered through SANPAD, and funded by the Netherlands Foreign Affairs and

17   then the Royal Netherlands Embassy to South Africa, enabled a strong established baseline

18   programme, from which the Nursing Sciences programme could draw. Further, SANTRUST

19   was also responsive to the policy impetus, the funding environment and organically was

20   able to harness enablers and build on an existing model.

21

22   There was, however, no evidence of an implementation plan, a supportive organisational

23   culture or of effective ongoing communication at stage four of the implementation process.

24   Although a formal implementation plan was lacking, staff were recruited according to the

1   skills and needs for the operation of the programme and timelines were set and revised as

2   necessary. For example, timelines for the delivery of the programme took account of the

3   academic schedules of the universities from which the PhD candidates were recruited and

4   the schedules of the module facilitators. Evidence to support the existence of a supportive

5   organisational culture as a programme enabler was not found, but further observational

6   research would be needed to assess this enabler more fully.

7

8   **Barriers to the Implementation Process**

9   Identified barriers to the implementation of the programme are illuminated in Table 2,

10   according to the stages of implementation. Evidence was found for the presence of all of the

11   barriers of external environmental factors, resistance to change, and vested interests. The

12   most challenging barrier in the external environment was the difficulty in attracting

13   prospective applicants, who were predominantly aged >40 years and questioned their

14   suitability to the programme. Although the rate of candidate attrition was low, family and

15   work commitments nevertheless impeded some candidates' ability to maintain engagement

16   with the programme. There was also evidence of resistance to the programme; in particular,

17   there was a low attendance rate by supervisors at the supervisors' module.

18

19   **Discussion**

20   The application of an implementation framework to evaluate a PhD capacity-building

21   programme is, to the best of our knowledge, unique. The findings demonstrated the

22   practices that enabled successful implementation of the programme, and highlighted

23   barriers that need to be addressed. However, results obtained need to be interpreted in

24   light of the limitations of the study. Firstly, a retrospective as opposed to a prospective

1   design was employed, which led to the use of existing data sources rather than the

2   generation of purposeful data to measure the implementation of the educational capacity-

3   building programme. A further limitation of the study is that longitudinal tracking data of

4   the two cohorts, post the programme, has not yet been systematically gathered or

5   synthesised as we highlight further below. This has particular relevance in terms of down-

6   stream impact: namely how many of these Candidates have actually obtained their

7   doctorates. While year-on-year, the Candidates report progress in terms of their proposal

8   and evolving chapters, there has not been sufficient time lapse to determine how many of

9   them have graduated with a PhD and what impact that has had on Nursing Science

10 scholarship in South Africa.

11

12 Additional to this, there is also the limitation of this study not mapping and considering

13 other university-specific programmes that are run in-house on research methodology.

14 These in-house programmes might complement the success of the cohorts in that the

15 Candidates achieve both external and embedded assistance towards their expertise in

16 research methodology. As stand-alone, in house support, these same programmes might

17 achieve similar or equivalent results as SANTRUST, but are just not recorded in a centralised

18 knowledge hub, such as provided by SANTRUST, given its position as an external and meta-

19 based organisation in doctoral capacity-building. As such, an experimental design with

20 different control groups (SANTRUST; In-house; Mixed and No Support) might well serve

21 future research directions.

22

23   However, in spite of these limitations, the evaluation of the implementation of the

24 SANTRUST Pre-Doctoral Proposal Development Programme through the mapping of

1 evidence onto an implementation framework (Burke, et al., 2012) enabled the examination

2 of the strengths and weaknesses of the implementation infrastructure to support the

3 delivery of the programme. Enablers that appear to require strengthening include the

4 securing of resources, the development of an implementation plan, the fostering of a

5 supportive organisational culture, and greater monitoring and evaluation. The lack of

6 interest by the Department of Health to fund and upscale SANTRUST to a nationally-owned

7 programme is problematic for the future sustainability of the programme. The over-reliance

8 of lower income countries on international funds to build health research capacity, and the

9 need to develop better links with national policymakers, non-governmental organisations,

10 and the public, has been highlighted in the literature (Sitthi-amorn & Somrongthong, 2000).

11 Further stakeholder engagement and advocacy work appears to be required. Smit et al

12 (2013) highlighted the need for further research into the sustainability of the SANTRUST

13 programme and how knowledge networks built through programmes can translate into

14 enduring and practical trans-institutional and transnational ongoing research. The authors

15 also highlighted the need for further study on how the programme may develop with both

16 the use of technology and the existing traditional face to face model of interacting emerging

17 PhD scholars and national and international facilitators.

18

19 Monitoring and evaluation, in addition to learning from experience, was evident across the

20 implementation stages, but further monitoring and evaluation would be beneficial to ensure

21 desired indicators were being met and outcomes were being achieved. Within the current

22 evaluation, the benefits and outputs of the PhD Proposal Development Programme were

23 too disperse for invested role players to make the connection and "join the dots", as

24 benefits were spread over twenty-three universities and their faculties. As noted above,

1   further longitudinal tracking of the achievements and research metrics of doctoral

2   candidates' throughput is required. It would also be beneficial to develop an

3   implementation plan detailing specific tasks under each stage of implementation and

4   corresponding responsibilities and timelines, which would help to support systematic and

5   structured implementation planning and ongoing monitoring. While anecdotal monitoring

6   evidence for its positive impact exists, with additional research providing confirmatory

7   evidence that the SANTRUST programme had a tracked relationship with the increase in

8   doctoral qualifications, a stronger case for the success of the programme in improving the

9   Doctoral pipe-line and impact could be made (ASSAf, 2010). However, examining the impact

10   on individual researchers is insufficient, and examining the impact of capacity-building

11   initiatives on improvements to practice, policy, and health equity, while challenging, is also

12   required (Simon, 2000).

13

14   While no evidence of a supportive organisational culture was found, further qualitative

15   research is required to assess this implementation enabler so that potential weaknesses can

16   be addressed. The international literature points to a number of challenges related to a

17   supportive organisational culture, such as the location of academic departments within

18   wider institutional, professional, and political networks, whose competing agendas need to

19   be negotiated (Segrott, et al., 2006). The organisational culture of research custodians at

20   Executive Management level in the universities needs to be carefully considered to ensure it

21   is not at odds with the initiative. While there have been briefing sessions with

22   Deans/Directors of Research and Heads of Nursing Schools of all public Universities in South

23   Africa, a supportive organisational culture needs to be embedded within universities, which

24   requires seeking behavioural and attitudinal change. This could be achieved through a

1   number of methods such as communicating a compelling vision for change and identifying

2   'champions' within universities to drive the programme.

3

4   In addition to the evidence for implementation enablers, barriers have also been identified,

5   some of which are outside the locus-of-control of SANTRUST such as the slow and

6   numerically-small Masters pipe-line, and others which can be addressed through extensive

7   and well-resourced stakeholder engagement. Barriers identified in the external environment

8   are well-documented in the literature. Internationally, there is a shortage in graduate-

9   prepared nurses in the workforce (Edwards, et al., 2009), and individual and collective

10   attitudes and values about research within the profession can impede engagement in

11   doctoral education (Segrott, et al., 2006). The competing work demands on nurses, coupled

12   with limited administrative support and difficulty in accessing basic research infrastructure

13   also hinder engagement (Edwards, et al., 2009; Segrott, et al., 2006). The programme can

14   exert greater influence over the barriers of resistance to change and vested interests, such

15   as the resistance from Universities to engage in the programme and/or release staff to

16   attend as candidates due to faculties being overstretched.

17

18   Another barrier requiring extensive advocacy for the programme is the resistance from

19   Universities to engage in the programme and/or release staff to attend as candidates due to

20   faculties being overstretched. This resistance was also evidenced by the low attendance rate

21   of supervisors attending the supervisors' module and their resistance to their students'

22   diversified learning and the new kinds of knowledge that they bring into a dyadic

23   relationship. It emerged from the data that SANTRUST has been cognizant of the muted

24   responses of the Supervisors, not only within the Nursing Science PhD programme, but also

1   on other generic programmes where supervisors' attendance was first not part of the model

2   and/or has also been low and infused with tensions (Smit, et al., 2013). Two books on

3   Supervision published by SANPAD, (the fore-runner of SANTRUST), in relation to Doctoral

4   Candidate-Supervisory relationships both reflect on the complexity of South African

5   supervision in terms of supervisors' heavy work-loads, supervisors' lack of skills and

6   resources, intrinsic power relationships and demoralised supervisors. These empirically-

7   driven workbooks therefore confirm the findings of low and resistant attendance of

8   supervisors as a barrier towards implementation of the SANTRUST model (Dietz, Jansen, &

9   Wadee, 2006; Wadee, Keane, Dietz, & Hay, 2010). Moving forward, effective, on-going

10   communication is critical for motivating staff, giving and receiving feedback, and

11   overcoming resistance to change.

12

13   Within the context of a recognised worldwide shortage of nursing scientists, the

14   implementation science framework enabled the evaluation of the initial stages of a national

15   PhD development programme roll-out and provided evidence on where further work was

16   needed in order to ensure effective implementation and overcome potential barriers. The

17   framework is useful to focus attention on those internal and systemic issues that, with

18   greater attention, might be addressed and create optimum conditions for implementation.

19   The more substantive areas, often located outside of the locus of control of the

20   implementing body, would benefit from being explored more broadly so as to determine

21   which could be incrementally, or even on an evolutionary level, attended to. It is even useful

22   to consider, that should concentrated, intelligible efforts be applied to the more substantive

23   levels, then the programme might well move beyond implementation in the niche area and

24   possibly even achieve innovation in the niche area. The development of a strong national

1   health research system can ultimately lead to a better health system and better health for

2   all (Lansang & Dennis, 2004).

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