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Seeking Impact and Visibility

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Seeking Impact and Visibility: Scholarly Communication in Southern Africa.

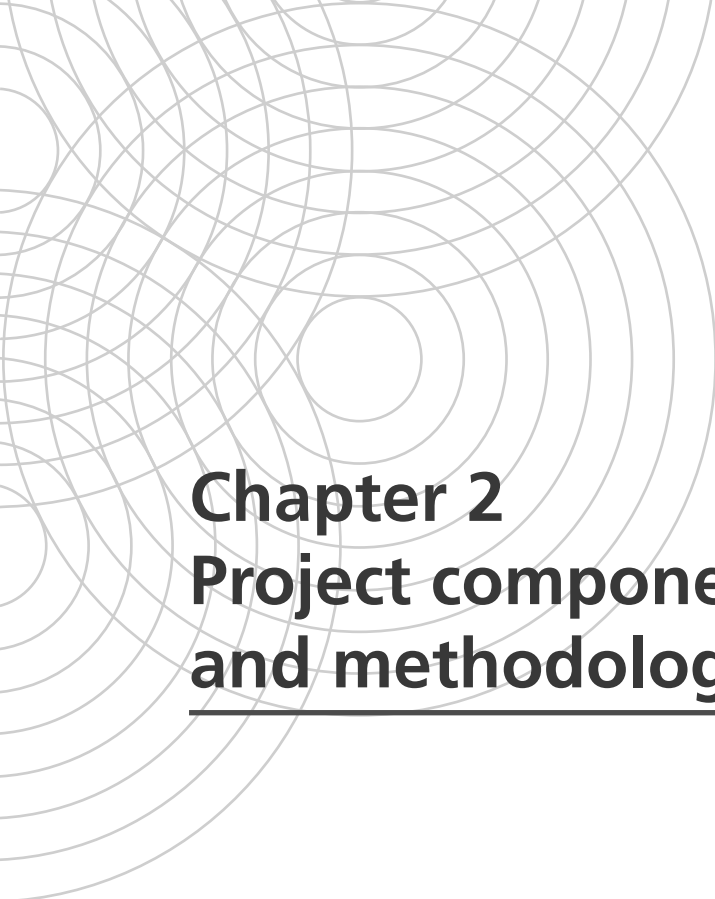
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Chapter 2

Project components and methodology

The SCAP programme arose from an 18-month scoping process that took place in 2008/2009 under the direction of Eve Gray, an African scholarly communications and open access expert (Gray 2006, 2010; Gray & Kahn 2010; Gray, Trotter & Willmers 2012). Hosted jointly by the Centre for Educational Technology and the Research Office at the University of Cape Town, SCAP was launched in March 2010.

Selection of pilot sites

One of SCAP's first tasks was to identify the three other universities – along with UCT, SCAP's host institution – to participate as partner sites. Though SCAP hoped that our work would be able to impact the discourse on scholarly communication throughout Africa, for practical (financial, logistical and linguistic) reasons, we decided to focus our research on universities in the Southern African Development Community (SADC) region. Through a collaborative process with the Southern African Regional Universities Association (SARUA),¹⁰ SCAP assessed potential university partners against a series of criteria such as level of research engagement, history of dissemination activity, as well as other characteristics such as size and language.

The four institutions in the SCAP sample happened to be in the most research-productive countries in the region according to the Thomson Reuters ISI index. As Mouton *et al.* (2008) show in Table 2.1, South Africa is the most productive country in the region, producing an average of 80% of all output in SADC for the period 1990–2007 (119 papers per million of population compared to the regional average of 29 papers per million). Botswana was the second most productive country with 96 papers per million, while Mauritius and Namibia were the only other two countries with productivity levels above the regional average.

¹⁰ SARUA is a regional higher education and vice chancellors' forum operating in SADC with a strong open access strategic focus. See: www.sarua.org/

Table 2.1 Ranking of SADC countries in terms of ISI papers per million of the population (2007)

Country	Total population millions (2007 est.)	ISI papers (2007)	Papers/million of population
South Africa	47.0	5.505	119.3
Botswana	1.8	172	95.5
Mauritius	1.2	47	39.1
Namibia	2.0	70	35.0
Zimbabwe	12.3	251	20.4
Swaziland	1.1	18	16.4
Malawi	13.6	209	15.4
Zambia	11.5	155	13.5
Tanzania	39.3	492	12.5
Madagascar	19.4	150	7.7
Lesotho	2.1	13	6.2

(Source: Mouton *et al.* 2008)

Despite concerns about the value of the ISI system (which we detail in Chapter 3), these indicators were useful in terms of categorising the study sites in relation to other SADC higher education institutions (HEI) and their apparent research productivity. The fact that SCAP was working with universities from the four most research-productive countries in the region meant that we could explore correlations between size, output productivity and capacity in determining how feasible it was for regional institutions to profile the knowledge they produce. Though many differences exist between SADC institutions, if the most productive of these faced visibility challenges, then it stood to reason that the others would face similar problems, perhaps even more acutely.

Once the universities of Botswana, Mauritius and Namibia were nominated, SCAP reached out to their vice chancellors to propose partnerships. We sought to obtain senior managements' mandates to engage with their institutions' academic communities and to create the necessary buy-in for us to research these communities' scholarly activities. Institutions were invited to designate research coordinators (RCs) – senior academics with an interest in open access practices – who would facilitate identification of pilot sites within the institution and to appoint research assistants to assist with data collection and other project work.

We believed that it was not feasible, given time frame and resource constraints, to research the scholarly communication practices of academics throughout the entire university; therefore we focused on pilot sites that we hoped would act as microcosms of the institution, allowing us to extrapolate lessons learned and recommendations for sharing with the rest of the institution – and to other African institutions.

We realised that scholarly communication in these contexts would be impacted by varying institutional, disciplinary and cultural norms; we therefore always tried to remain clear as to which structural forces were doing the most to shape a particular activity. While this minimised our capacity to generalise across all four sites in certain respects, it

also allowed us to understand the diversity of these contexts and gain a nuanced sensibility about their challenges and opportunities. With this point in mind, the following served as our pilot sites:

- UB: Department of Library and Information Studies (DLIS) in the Faculty of Humanities (FoH) – 18 members
- UCT: Southern African Labour and Development Research Unit (SALDRU) – an independent research unit in the Faculty of Commerce (Comm) – 32 members
- UoM: Faculty of Science (FoS) – 55 members
- UNAM: Faculty of Humanities and Social Sciences (FHSS) – 77 members

SCAP approached each of the study sites as unique contexts with independent historical legacies and research communication cultures. Therefore efforts were made to ensure parity in project activity across the sites. However, the principal investigation (PI) team acknowledged that the approach to UCT would be slightly different because we were already “embedded” in the institution, a fact that both limited and expanded the kinds of insights we could gain about it.

Moreover, we understood that UCT was atypical in both Africa and Southern Africa. As the highest-ranked university on the continent¹¹ with a history stretching back to the 1820s,¹² UCT enjoyed significant financial, infrastructural and human capacity advantages over the other three universities. It also boasted a significantly larger academic staff: according to the most recent public figures, UCT¹³ had 2,200 academic staff, UB¹⁴ had 877, UNAM¹⁵ had 340 and UoM¹⁶ had 293. Nevertheless, these differences did not invalidate a comparison across institutions, but simply begged for continued recognition of the structural and historical differences that defined them.

The principal investigation (PI) team

SCAP research was led by a PI team based in UCT’s Centre for Educational Technology (CET), a department in the Centre for Higher Education Development (CHED). This team comprised a research lead, a research officer, a research assistant, the programme manager and the programme director. All research work was undertaken in consultation with RCs at participating sites, but the ability of RCs to formulate and conduct independent research was constrained by the fact that they held academic posts with concomitant teaching and administrative loads. In addition, the RCs had been placed in the role because of their interest in the area, not necessarily their expertise. There was therefore significant capacity development entailed in the exchange between the PI team and institutional research teams.

11 This is according to the 2012–2013 Times Higher Education World University Rankings, available at: www.timeshighereducation.co.uk/world-university-rankings/2012-13/world-ranking/region/africa

12 Ages of participating institutions – University of Botswana: 30 (founded 1982), University of Cape Town: 183 (founded 1829), University of Mauritius: 47 (founded 1965), University of Namibia: 20 (founded 1992).

13 See UCT 2012.

14 UB Facts and Figures (2013), available at: www.ub.bw/content/id/1989/Facts-and-Figures/

15 SARUA profile of UNAM, available at: www.sarua.org/?q=uni_University%20of%20Namibia

16 UoM: History (2011), available at: http://sites.uom.ac.mu/induction/index.php?option=com_content&view=article&id=46&Itemid=1

The SCAP programme was designed around four rounds of institutional site visits to each of the participating sites. These visits allowed the PI team to build institutional relationships, collect research data and formulate a framework for implementation activity. The PI team also gave presentations, ran workshops, conducted interviews and engaged in individual conversations with a wide range of stakeholders on each visit in order to stimulate discussion around scholarly communication.

The site visits also gave the PI team a more nuanced, ethnographic understanding of the lived reality of the pilot academics. Team members were able to see (and sometimes experience) first-hand the administrative, technological and social qualities defining scholarly communication activity at our partner sites. (For instance, by using the internet at some universities, we could see what scholars meant when they complained of low bandwidth; or by trying to source official information from certain universities, we could identify with scholars' "red tape" woes.)

Methodology

SCAP's overall research design was based on the case study approach. We adopted this so that we could conduct in-depth research at four universities in four countries across different faculties and disciplines and so that we could experiment with a diverse set of intervention strategies. The case study approach allowed us to probe deeply into the different field sites (Flyvbjerg 2011; Mitchell 1984) while at the same time ensuring that some of our data would be comparable across them.

SCAP's methodological approach could be categorised as "developmental intervention-based research", as it went beyond a concern for only data collection to that of research as praxis, aiming to enable participants to understand and change their realities. To help develop capacity and stimulate our pilot environments, the programme incorporated implementation processes for experimenting with new approaches to open scholarly communication that ran alongside our research process.

Cultural Historical Activity Theory

SCAP used Cultural Historical Activity Theory (CHAT) to inform our research approach. We chose CHAT because it is useful for identifying obstacles in complex activity systems, especially those that are structured by deep, complicated and sensitive cultural and historical elements.

With its origins in Soviet social psychology in the earlier part of the 20th century – in particular the work of Vygotsky and Leont'ev (Chaiklin & Lave 1993; Daniels 2008) – the key tenets of early Activity Theory is that activity is mediated action and that the social and the technical are mutually constituting. These tenets were then developed by Engeström (1987, 2000; Cole & Engeström 1993) into the CHAT approach that we utilised, which locates the activity systems concept at its centre.

An activity system is a collective formation in which a subject (here referring to a group, not an individual) acts purposefully towards the fulfilment of an object and a set of

outcomes. Figure 2.1 shows a representation of an activity system with its constituent nodes placed at distinct points on the triangle.

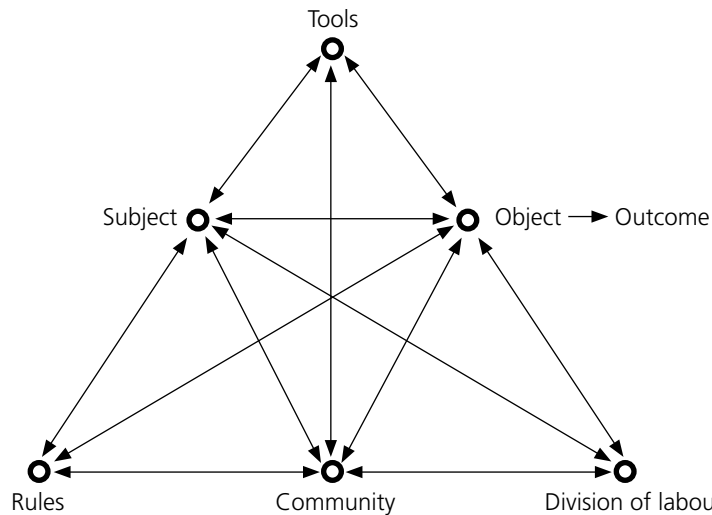


Figure 2.1 Representation of an activity system in the CHAT tradition

The diagram above represents the different nodes that constitute an activity system. Starting with the top horizontal line, a subject seeks to achieve a purpose (the object) which will result in an outcome. In our research, the subjects were academics seeking to produce and disseminate research (the object) so that they could contribute to national development, secure promotion, comply with an institutional mandate, etc. (outcomes).

During this process, subjects utilise tools (the top node) such as computers, books, personal credentials and other artefacts to achieve their purpose. This means that all action is “mediated” by the use of such tools.

Along the bottom horizontal line are three further nodes that also serve to mediate action: rules, community and division of labour. According to Engeström (1996: 67), the rules refer to the explicit and implicit regulations, norms and conventions that enable and constrain action within a system. In our context, these rules were often disciplinary norms (informal) and institutional policies (formal).

The community comprises the people and groups sharing the same general object as the subject. In our context, these were typically funders, colleagues, librarians, managers and students.

Lastly, the division of labour refers to the horizontal division of tasks between members of the community and the vertical division of power and status. In the case of academics, the horizontal division involves relationships with peers (inside and outside the university) in the production and communication of research, while the vertical division involves relationships with research and university managers, as well as national research structures. The various non-academics listed in this node also have their own

activity systems that are devoted to different objects. These other activity systems exist in fluctuating states of tension and alignment with this focal activity system, depending on how they are structured and engaged.

A key virtue of this design is that it presents activity systems as “ecosystems”, in which stimulation or change in one node leads to transformations throughout the entire system. For instance, the introduction of new tools (repositories, etc.) or the alteration of rules (policies, etc.) would impact the entire system. Thus, we thought of these activity systems as ecosystems that were unique, dynamic and sensitive to change.

CHAT principles

In CHAT theory, activity systems are defined by five key principles:

1. *Collective activity*: “A collective, artifact-mediated and object-oriented activity system is taken as the prime unit of analysis. Activity systems realise and reproduce themselves by generating actions and operations” (Engeström 2001: 136).
2. *Multi-voicedness*: “An activity system is always a community of multiple points of view, traditions and interests. The division of labour in an activity creates different positions for the participants [and] the participants carry their own diverse histories” (Engeström 2001: 136).
3. *Historicity*: “Activity systems take shape and get transformed over lengthy periods of time. Their problems and potentials can only be understood against their own history” (Engeström 2001: 136).
4. *Contradictions*: Instability (internal tension) and contradictions are the “motive force of change and development” (Engeström 1999: 381). “Contradictions are not the same as problems or conflicts. Contradictions are historically accumulating structural tensions within and between activity systems” (Engeström 2001: 137).
5. *Expansive learning*: “Activity systems move through relatively long cycles of qualitative transformations. As the contradictions of an activity system are aggravated, some individual participants begin to question and deviate from its established norms. In some cases, this escalates into collaborative envisioning and a deliberate collective change effort. An expansive transformation is accomplished when the object and motive of the activity are reconceptualised to embrace a radically wider horizon of possibilities than in the previous mode of the activity” (Engeström 2001: 137).

Change laboratories

Key to the CHAT methodology are “change laboratories” (Engeström, Miettinen & Punamäki 1999). These are workshop-like events where participants collectively identify contradictions in their activity systems. In this manner, they explore interventions that would align those systems so they can better achieve their object. SCAP took it as axiomatic that each of our pilot sites had misalignments that could be identified and re-aligned so that they could operate more optimally. For many change lab participants, the CHAT approach offered a useful method for comprehending the complexity of their scholarly communication ecosystems, inspiring them to look beyond technical

(tools-oriented) solutions to their challenges and to consider them from the vantage of each node and connection.¹⁷ The knowledge we gained from our change labs was contextualised through data from our research strands. Together these generated rich descriptions of the conditions under which scholars conduct and communicate research.

Research components

SCAP's research comprised three interlinked components: expansive learning and change/advocacy; research strands; and implementation initiatives. These components are shown in Figure 2.2. With CHAT at the centre, the four research strands are listed on the right, the four implementation initiatives are listed on the left and the expansive learning element connects the two at the bottom. But as the arrows show, these were mutually-constituting components, reflexively influencing each other as they progressed.

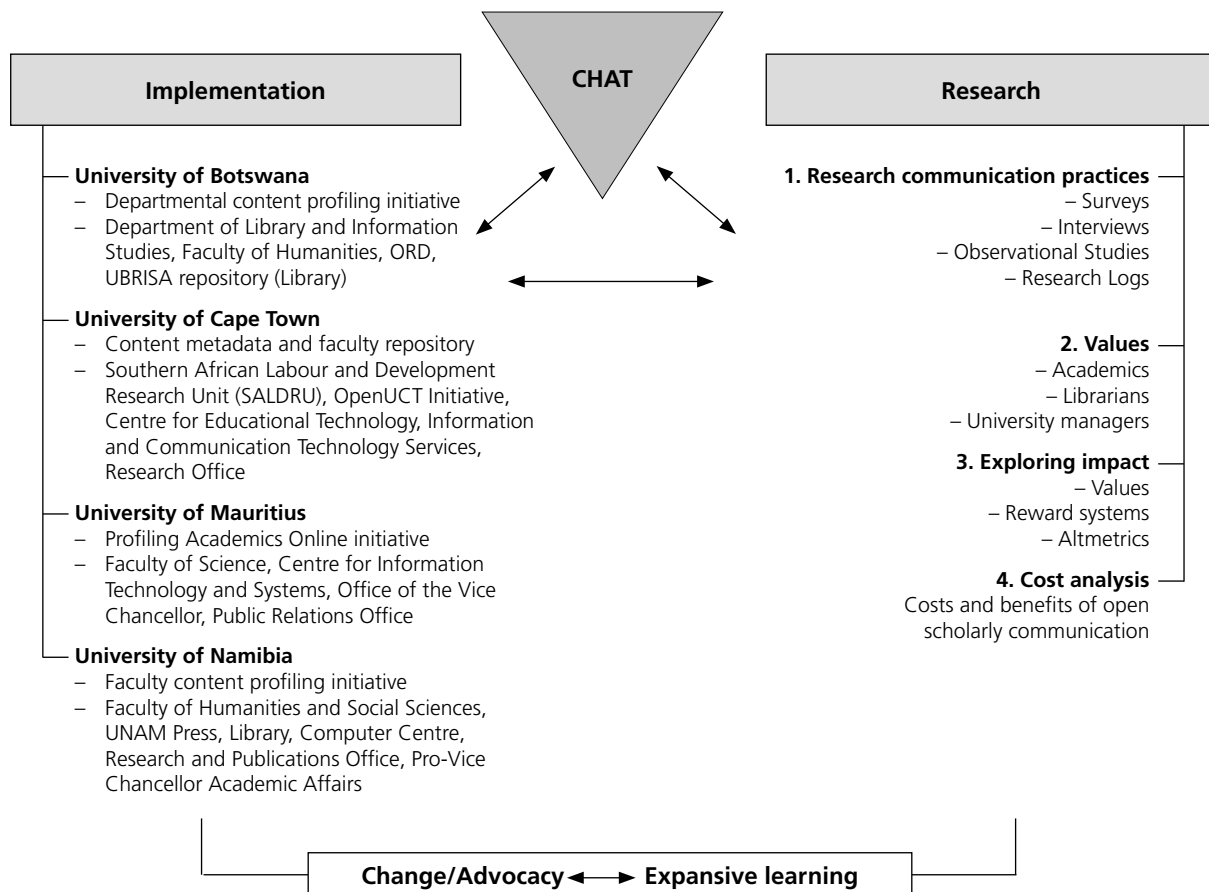


Figure 2.2 Diagrammatic overview of the SCAP operational approach

17 SCAP's adoption of CHAT was unusual in that our study sites did not specifically request interventions around scholarly communication, as typically occurs with CHAT/change lab engagements. In fact, many participants only became aware of the contradictions in their activity systems by exploring them with us.

Expansive learning and change/advocacy

The expansive learning component involved SCAP’s use of CHAT with its emphasis on conscious stimulation of and reflection on the scholarly communication activity system amongst staff members in each study site. This was implemented through iterative change laboratories, workshops and advocacy work. These CHAT “techniques” animated and integrated the other two components: the research strands that examined the scholarly communication ecosystem in each site and the technology implementation initiatives.

This research component involved rigorous documentation of the participatory processes involved in the change laboratories and site visits. SCAP tried to incorporate the analytical power of CHAT into every activity and interaction. But most pilot site participants’ experience of CHAT was most keenly felt in the change laboratory workshops. It was on those occasions that we explained the CHAT methodology and how its discursive tools could help us to elucidate the pilot site’s scholarly communication activity system and develop an intervention that improved its functionality.

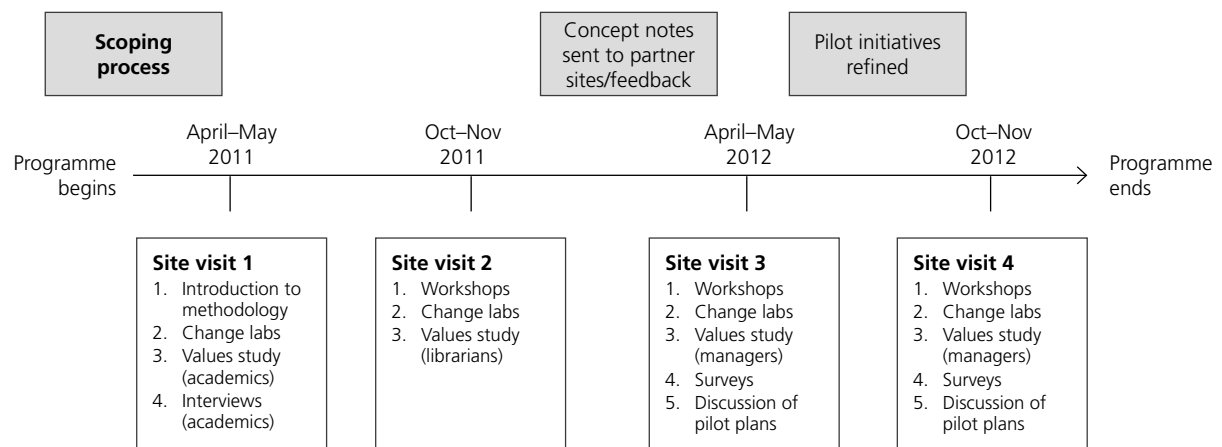


Figure 2.3 Overview of SCAP research and implementation schedule

At each university, the change lab participants were typically members of the relevant pilot site, although university managers and librarians also attended sessions. Numbers varied between seven and 13, with a small core who participated throughout and others who came and went. The change lab workshops were full-day sessions, contributing to a broader research and advocacy programme during the PI team’s week-long site visits. Figure 2.3 shows when we conducted the change labs and how this coincided with other research we were carrying out at the host institutions.

In the first change lab workshops we held, we started by introducing the participants to the idea of scholarly communication as an activity system. We explored CHAT principles, discussed the virtues of the CHAT triangle as a heuristic and analytical device and asked participants to identify areas where there were challenges or tensions in their scholarly communication ecosystems.

In the second workshops, we started populating the activity system triangles with the information given by the pilot participants, identifying the subject, object and outcome of the system, as well as the tools, rules, community and division of labour. Once all of the fields were populated, we started identifying the challenges, contradictions and opportunities within the activity systems so that we could understand where misalignments were occurring and how we could re-align them through an implementation initiative. The data from these workshops gave us a lot of the information we required to write up concept notes for the various implementation initiatives that we ended up pursuing. While most participants initially found this CHAT triangle process awkward, they quickly began to see its descriptive and explanatory power; however, once we established how each node was impacting the others, it allowed them to see their work activity in a different light. As an example, Figure 2.4 shows a completed triangle for UoM FoS.

In the third set of workshops we re-presented the fully populated activity system triangles so that participants could amend and verify them. The PI team also shared the concept notes for the implementation initiatives, eliciting useful feedback in the process.

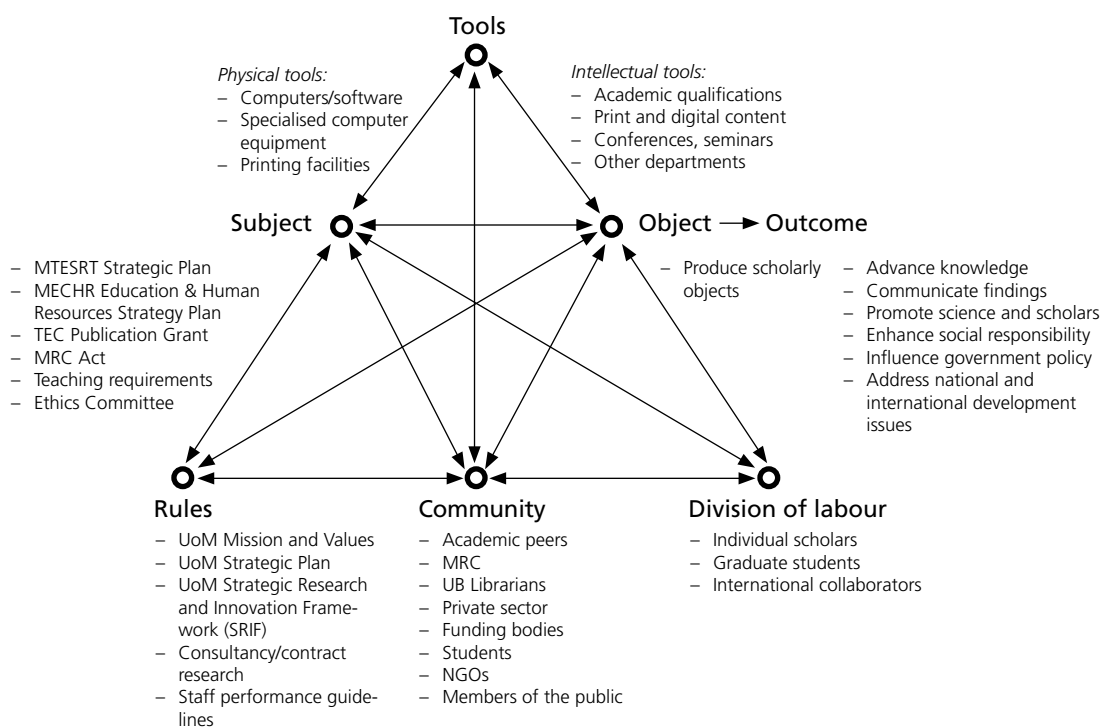


Figure 2.4 UoM FoS activity system triangle populated with change laboratory material

In the fourth and final set of workshops the PI team presented preliminary findings from the research strands, which enabled a “mirroring” process (i.e. the final stage of the expansive learning cycle implicit in the CHAT process). By “reflecting” scholars’ activity systems to them in a descriptive and analytical fashion, we were able to secure crucial feedback from them for eventually arriving at our concluding findings (presented

in Chapter 8). During that final visit, the participants also assessed the progress of the implementation initiative.

The change laboratory process provided significant data on each site's scholarly communication activity system and proved to be an invaluable forum for engaging with academics, librarians and managers.¹⁸ For many, our workshops provided a much-needed space for participants to be self-reflexive about their scholarly communication activity. A number also took advantage of the episodic attendance of senior managers to share their (often critical) perspectives with administrators with the clout to change policy.

As part of the expansive learning cycle, in addition to the change labs that we conducted, we collected institutional data through the many meetings, conversations and informal interactions we had with institutional stakeholders during our site visits.

Research strands

SCAP's research revolved around four strands: research and communication practice, values, impact and costs. Here we discuss the processes employed to carry out this research and how we integrated the materials in our analysis.

Research and communication practice

The primary question driving our research was “what is the current state of scholarly communication in Southern African universities?” To answer this, we utilised multiple research mechanisms to gather data – namely surveys, interviews, day-recalls, personal observations and informal conversations.

Because of the transformations taking place in the field of scholarly communication – due to changes in global research activity (Cooper 2009, 2011; Etzkowitz 2004; Gibbons 1997; Gibbons *et al.* 1994) and Web 2.0 technologies (Palmer 2005; Procter *et al.* 2010; Tenopir 2003; Thorin 2006; Weller 2011) – we felt it was important not only to establish baseline indicators for scholars' activities, but to examine their day-to-day practices.

We viewed the “practice turn” in the social sciences as offering us an approach that was compatible with our CHAT methodology in that practices can be seen as “arrays of human activity” that are materially mediated and “organised around shared practical understanding” (Schatzki 2001: 2, quoted in Palmer & Cragin 2008: 169).

We also built a “research and dissemination cycle approach” into our data collection instruments so that we could understand our research subjects' scholarly communication practices at each stage of the research and dissemination process. By breaking their activity down into discrete elements of a larger cycle, we believed we could identify how disciplinary norms, output genres, funding circumstances and personal values played into their research and communication practices. It would also help us to identify possible contradictions in their activity systems, while pointing to potential opportunities

18 All of our change lab workshops, seminars and formal meetings were digitally recorded and fully transcribed.

for improvement. Furthermore, as Palmer (2005: 1140) states, “in the cycle of scholarly communication scholars play the role of both consumer and contributor of intellectual works within the stores of recorded knowledge.” Hence we utilised Czerniewicz’s (2013) research and dissemination cycle model because it incorporates an understanding of how open access and Web 2.0 technologies are transforming scholarly communication opportunities (which we discuss in Chapter 5).

In the context of that cycle, we also explored what enables or constrains the flow of scholarly communication by seeking to understand what difficulties scholars may experience with regard to access to and searching for scholarly work, as well as their dissemination choices.

This research strand therefore included quantitative and qualitative methods of data collection, aiming to produce “thick descriptions” of these practices in each of the study sites. We hoped to obtain “insider accounts” of African scholars’ day-to-day practices as they went about producing, accessing and sharing research.

The first method that we used in this strand was a survey that was prepared with reference to the questions and findings from a number of international scholarly communication studies and surveys (Houghton, Steele & Henty 2004; Maron & Smith 2008; Palmer, Tefteau & Pirmann 2009; Procter *et al.* 2010; Rowlands, Nicholas & Huntingdon 2004; Rowlands & Nicholas 2006). In particular, we drew on Houghton, Steele and Henty’s (2004) study, which focused on three key areas of research activity: communication and collaboration; information search and access; and dissemination and publication. We adapted these, however, to take account of our focus on the stages in the research cycle. The survey included the following categories of questions:

- General information
- Research and dissemination activity
- Collaboration and communication
- Information access and searching
- Forms of Web 2.0 engagement
- Faculty attitudes and support

At each university, the SCAP research assistant administered the survey to between 28 and 50 academics in the relevant faculties. The data was coded and cleaned, entered, and analysed within the PI team. The results are reported in Chapter 5.

The second research instrument we used was a semi-structured interview aimed at gaining a more granular feel for day-to-day research practices and what enabled or constrained them. The interviews covered:

- a discussion about their answers to the survey form
- questions on the individuals’ general background and history
- narratives of three recent research projects or pieces of research that they had undertaken.

At the same time, these interviews sought to account for the social and organisational infrastructure within which research projects unfold, in particular the nodes in the activity system. In these narratives, academics were encouraged to focus on the stages in the research cycle, such as:

- how the research started and what motivated it
- what it consisted of
- what enabled or constrained the production of outputs from the research
- what forms of interaction and networking were involved
- the uses of Web 2.0 technologies
- dissemination choices (journal articles or other genres)
- feedback on these outputs.

The CVs of the interviewees were collected, analysed and viewed in relation to the scholarly “shadows and footprints” research undertaken as part of the third research strand.

The third research method we used in this strand was the “day-recall”. This involved visiting a sample of the interviewees 24 hours after the first interview and asking them to narrate everything work-related they had done in those 24 hours, in order to elicit specific critical incidents that might shed light on what enabled or constrained research communication. In some cases this was repeated a second time.

At each university we conducted between five and seven “research and communication practices” (RCP) interviews each lasting about an hour-and-a-half. The interviewees were all academics who were seen to be active researchers and who had some understanding of open access issues and of the affordances of Web 2.0 platforms for scholarly communication.

Table 2.2 Total number of participants in SCAP's formal research processes

Interviewees/participants	UB	UCT	UoM	UNAM	Totals
Survey respondents	29	28	30	50	137
Change lab participants [1/2/3/4]	12/7/11/11	10/10/7/8	13/8/4/7	13/9/11/11	152
Values interviews (academics)	13	6	14	13	46
Values interviews (librarians)	5	4	5	3	17
Values interviews (managers)	5	5	5	5	20
RCP interviews (academics)	5	6	6	7	24
Totals	98	84	92	122	396

Values

The second strand of our research explored the values motivating university academics to conduct and communicate research. Drawing inspiration from a number of recent attitudes and behaviours studies focusing on academics in the global North (Archer 2008; Harley *et al.* 2007; Harley *et al.* 2010; JISC 2012; King *et al.* 2006; RIN 2009, 2010; Rowlands & Nicholas 2005), we sought to understand the foundational values driving research production in the Southern African context.

At each university, this entailed the PI team conducting focus group interviews with between six and 14 academics, individual interviews with between three and five librarians and individual interviews with five managers. This qualitative research was conducted during the course of the recurring site visits, with the focus group interviews lasting about an hour-and-a-half each and the in-depth individual interviews lasting between 30 minutes and one hour each. We recruited informants through convenience sampling, typically relying on our research coordinators to identify and contact the appropriate people for SCAP to engage.

For each category of university personnel interviewed, SCAP created a set of standardised questions (which were also asked at the other institutions), prompting respondents to reflect on their own and their institutions' research values. Through this, we were able to gather the data necessary for comparing scholars' values across the four universities. Below is the list of questions that interviewees were asked:

To academics (in focus groups):

- Why do you currently do research?
- Why would you (ideally) want to do research?
- How much does our African context influence these motivations?
- Are there different motivations driving basic and applied research? Do you feel that these motivations change in a developing context?

To university librarians (individually):

- What role do you currently play in the scholarly communication process?
- What role would you (ideally) like to play in that process?
- Does the African context influence the role you currently play, or would like to play, in this process?

To university managers (individually):

- Why do scholars at your institution conduct research?
- How does the African context impact their research motivations?
- What challenges do they face in fulfilling their motivations?

Through these questions, we sought to understand not only the values animating the production of local research, but how they were shaped by the African context and its various challenges and opportunities. The questions also formed the basis of sustained discussions concerning a variety of topics that organically arose through the respondents' reflections, such as university rewards and incentive structures, national development imperatives and consultancy work. This material generated data that was useful not only to our values research but to the other research strands as well.

In addition, we were able to obtain values-related information from our change laboratory workshops, surveys, day-recall sessions, interviews, implementation initiatives and personal observations gained through casual conversations and on-site experiences. The

fact that we were able to draw from multiple data sets, each with its own approach, was crucial for allowing us to get a comprehensive and complex view of scholarly values. The results of these values analyses are discussed in Chapter 5.

Impact

Academic research is one of the central concerns in a new, more accountable global academic environment. Traditionally conceptualised as peer-to-peer communication, the impact of a scholarly research object used to be tied solely to its importance in the academic community and not its importance in terms of socio-economic development. This has partly been a technological issue. Until recently the only quantitative measure of research impact was the Thomson Reuters ISI/WoS Impact Factor.¹⁹ It was also due to an understanding of university practice as separate from civil society and industry, and thus subject to a different set of rules. The professionalisation of the sector has brought with it interest from funders and governments about the demonstrable returns from investing in higher education (Power 1997; Raza 2009; Shore & Wright 1999; Strathern 2000).

Technological advancement in tracking tools now permits institutions to track a range of research object performance metrics, from traditional citation counts to downloads, bookmarks, page views and social media reports. Using these new methods, known as Altmetrics (alternative metrics), it is possible to obtain not just metrics and statistics, but to develop usage narratives that show how academic research is being used by civil society, making it possible to demonstrate the value of research to non-academic audiences and to track how it is being used. This information could help institutions to focus on refining their engagement with society, identify areas in which they are succeeding and determine where they could provide the most value to the community.

In order to experiment with Altmetrics in Africa, we initiated an output tracking exercise at our four study sites. Data was collected over a six-month period (May to October 2012) by research assistants at each site who were asked to acquire lists of publication outputs from their respective institutions. The data was examined to identify potential “impact narratives” as well as to identify any interesting or unusual characteristics.

This resulted in two policy briefs spearheaded by Cameron Neylon, a SCAP advisor:

1. Neylon C, Willmers M & King T (2014a) *Illustrating Impact: Applying Altmetrics to Southern African Research*. Scholarly Communication in Africa Programme (SCAP) Brief No. 1 for the International Development Research Centre, January 2014, University of Cape Town
2. Neylon C, Willmers M & King T (2014b) *Impact Beyond Citation: An Introduction to Altmetrics*. Scholarly Communication in Africa Programme (SCAP) Brief No. 2 for the International Development Research Centre, January 2014, University of Cape Town

19 Thomson Reuters, Journal Citation Reports, at: <http://thomsonreuters.com/journal-citation-reports/>

Cost-benefit

Our fourth research strand focused on the costs of scholarly communication in the African context, as well as the implications of moving to an open dissemination model. We saw this as a useful research effort because we wanted to be able to reduce a technologically and ethically complex proposal into a potentially simpler set of economic denominators that would allow institutions to judge the financial value of such a transition. We understood that for many institutions open access would only be of interest if it were cost-effective.

We explored a number of economic methodologies to help explicate the costs and benefits of African scholarly communication, namely cost-benefit analysis, cost-effectiveness analysis and cost-utility analysis. The initially envisioned process was to uncover institutional financial data during the period October 2011–October 2012. However, the PI team, in consultation with the relevant RCs, discovered that institutional financial reporting structures were insufficient for providing the granular detail required for any cost-utilising analysis. Moreover, data confidentiality concerns would have prevented it from being made available even if scholarly communication had been traceable through institutional reporting systems.

We therefore abandoned this line of research (because it was beyond the scope and capacity of the PI team and our partner universities) and instead focused on assessing the relationship between national development priorities, university mission commitments and open access strategies. This culminated in the production of an advocacy document led by Alma Swan, a SCAP advisor, which showed how open access could support African institutions' desire to contribute to national development imperatives while preserving their intellectual patrimony through digital profiling and curation strategies:

- Swan A, Willmers M & King T (2014) *Opening Access to Southern African Research: Recommendations for University Managers*. Scholarly Communication in Africa Programme (SCAP) Brief No. 4 for the International Development Research Centre, January 2014, University of Cape Town

Implementation initiative

SCAP's research design called not only for the collection of data from our pilot sites, but for these sites' active stimulation through customised implementation initiatives (or "interventions") that sought to improve the state of scholarly communication within the sites. Five principal assumptions underpinned these initiatives. They would:

1. be treated as experiments
2. address a challenge articulated by project participants in pilot sites and other institutional stakeholders
3. be publishing-oriented, addressing content profiling and dissemination through new tools and technologies
4. utilise open approaches (including open source software and publishing platforms) wherever possible

5. yield insights that could be extrapolated to the rest of the institution, developed in line with current institutional strategy, e-infrastructure and international standards and protocols around interoperability.

SCAP scoped and fulfilled the implementation initiatives during our four site visits. The first visit aimed to surface the contradictions in the scholarly communication ecosystem, while the three subsequent visits sought to create consensus around the nature of the initiative, identify stakeholders and policy frameworks, and implement the agreed-upon pilot process.

While the formulation process was participatory, the PI team played a considerable role in interpreting and translating the desires of informants into a feasible intervention. This was due to two factors. First, while informants had a clear sense of institutional challenges, they were often unable to articulate desired solutions because they were unaware of the new technologies that might overcome these challenges. Second, the PI team also had the responsibility of protecting the funder's interests and ensuring that the implementation activity adhered to open access principles.

At each pilot site, after identifying its scholarly communication challenges, needs and desires, our intervention focused on improving the visibility of the pilot site academics by either enhancing their capacity to build online profiles or establishing a useful workflow process for getting their materials onto their subject and institutional repositories. The results of this process are detailed in Chapter 6.

Integration and analysis of data

Through these multiple research strands, implementation initiatives and other information-gathering instruments, we were able to obtain a substantial amount of data for answering our two key research questions. To analyse the data, we utilised the inductive “grounded theory” approach and the “constant comparative” method. The process generally went as follows (although this was not uniform across all data sets):

- Reduce inputs to text (i.e. transcribe change labs and interviews, tabulate surveys).
- Identify and extract assertions from texts (listed initially according to research strand and university).
- Tag assertions with an intuitive notation system that allows us to keep track of their speaker, context of production and university affiliation.
- Code assertions according to thematic categories (which are derived organically from the data).
- Analyse (in narrow focus) the meaning of assertions in relation to each other within their thematic category, research strand and university context.
- Frame (in widening focus) implications of assertions from one theme with those of others, helping them to make sense of each other, but still within a given strand and university.
- Integrate analytical insights from research strands on a particular university (including from secondary literature and personal observations) to gain a nuanced

and comprehensive understanding of the institutional scholarly communication ecosystem.

- Compare integrated analyses from each university with each other, revealing similarities and differences in various aspects of their scholarly communication ecosystems, thereby yielding a clearer picture of regional communication practices.

In between these steps, we also stepped back and embarked on a more deductive process, which involved checking our data against key concepts and insights in the relevant secondary literature, as well as exploring “hunches” based on immersion in the sites and the data, which were then tested against the developing themes and frames. This analytical process was largely carried out by the PI team, but once key insights and preliminary findings had been established, they were shared with participants in the pilot sites – especially the RCs – so that they could interrogate, amend or verify them.

Conclusion

Our methodology ultimately combined a number of approaches so that we could obtain data at our pilot sites from multiple angles. We realised early on that no single approach would yield the detail we desired from the institutions; thus, we took multiple, overlapping approaches to the sites so that we could understand them in a comprehensive way.

The first element defining our multifaceted research approach was the fact that we engaged with the pilot sites as “case studies”: that is, each of them comprised one of four sites in our broader research effort. Researching these different sites using similar methods and obtaining comparable data (Trotter *et al.* 2014a, 2014b, 2014c, 2014d) meant that they were able to contribute to this synthesis study which offers a view of scholarly communication spanning the Southern African region. Yet we never forgot that each of these sites bore their own unique histories, traditions and practices; therefore we sought to gain nuanced understandings of each site so that, when we compared them, we were able to grasp precisely where their similarities and differences were located.

The second element of our approach was our use of the CHAT methodology as our primary analytical device. This influenced not only the metaphors that we utilised to assess these sites – thinking of them as activity systems (or ecosystems) – but also the style of engagement that we had with participants. We deployed an important CHAT data-gathering device, the change laboratory, which allowed us to work with university stakeholders to identify contradictions in their scholarly communication ecosystems. In this way, participants were not simply research subjects, but were co-partners in our quest to understand and change their reality. Their “buy-in” to this process was critical to the success of the project as they took a degree of ownership in it.

The third element of our approach was that we were able to obtain a quantitatively rich description of our pilot sites, primarily through the 25-page survey that we had participants fill out, but also through various change lab exercises that we deployed during our site visits. This formed a crucial “objective” layer of data that provided a foundation for cross-comparison between sites.

The fourth element of our approach was that we were also able to obtain a qualitatively rich understanding of these activity systems through our interviews, day-recall sessions, conversations and observations during our four rounds of site visits. We believed that this layer of ethnographically informed information was crucial for us being able to understand the complexity of these sites.

The final element of our research approach, which ended up yielding a number of our more subtle and durable insights, was our use of implementation initiatives to stimulate the pilot sites' activity systems. Through these, we experienced first-hand the bureaucratic, political, social and technical challenges involved in operating in those environments. By bringing money and resources into our engagement, we initiated a much more complicated set of relationships than if we had simply operated as a research programme. This often led to significant discomfort on both sides, but it helped to reveal the "actual", as opposed to the simply "discursive", commitments that both sides brought to the relationship.