Establishing and maintaining a teaching and learning community of practice:

Enhancing scholarship and practice in the Rhodes University Faculty of Science

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Introduction

Since democratic elections in 1994 the South African higher education landscape has changed considerably, not least of which has been the transformation of the student body to address issues of equity and redress. However, there appears to have been insufficient transformation of curricula to accommodate this 'new' body of students, who mostly attended poorly functioning schools that inadequately prepared them for higher education studies. Consequently, retention, throughput and graduation rates remain poor in the sector (see Scott, Yeld and Hendry 2007; CHE Report, 2013) and many academics are seeking ways to better accommodate and support student learning through improving their own teaching practice. Whilst a 'common sense' approach is often used to make such improvements, many academics are engaging in a more scholarly manner to address this issue. Scholarship of teaching and learning (SoTL) in this report refers to the 'use of teaching and learning literature for reflection, discussion and the systematic study of teaching and learning as well the public sharing and review of such work' (Adendorff 2011, p306). Huber and Hutchings (2005) suggest that such scholarly engagement has potential for improving the quality of higher education.

SoTL is increasingly being supported in higher education institutions through formal structures such as professional development courses, of which Rhodes University (RU) has a number. However, for academics working in the sciences where philosophical approaches, methodologies and theoretical positions can be markedly different from those of education, such scholarly work can be an ongoing challenge. Based on comments in this regard I felt that in addition to the formal courses, a less formal support system, such as a collaborative community of practice (CoP), would benefit some science staff. Wenger, McDermott and Snyder (2002) define a community of practice as '[g]roups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis' (ibid. p4). CoPs are typically characterised by some level of informality and have a high degree of connectivity where individuals can all learn from each other, either to meet a common purpose or goal (Wenger 1998), or simply to share knowledge (Wenger, McDermott and Snyder 2002).

This TAU 'change' project therefore focussed **on establishing an informal, collaborative and supportive community of practice in the Science Faculty at Rhodes University that has as its aim to improve teaching and learning practices through engaging in scholarly work.**

Approach and process

The practical process of establishing a CoP was achieved by identifying potential group participants. I invited eight Faculty of Science staff members who I knew were either (a) interested in improving T&L practice and were seeking like-minded people for discussions and ideas, or (b) wishing to develop as T&L researchers but, despite relatively good institutional support in terms of formal courses and funding were, for various reasons, still finding it difficult to get traction. At the first meeting in February 2018 we charted a possible way forward as a Science Education Research Group (SERG) – although our purpose and direction still appears to be evolving.

SERG, which has its own RU Moodle site for messaging and posting resources, has so far held six supportive, and engaging meetings. The group has reduced down to a core of five regular attendees, with two semi-regular attendees (both for personal reasons not being regular attendees) and the last member has resigned from the university.

In the first meetings we essentially were 'finding our feet' as a group, and therefore tended to discuss burning issues in our own teaching contexts. Because most of the group have been, and still are, very involved in the faculty-wide curriculum review process, this also took centre-stage. As a result of these discussions, small individual research projects such as maths preparedness of incoming scholars and student reflections on learning have been initiated. Other discussions have focussed on possible areas of scholarly collaboration, and this has proved to be a generative space resulting in (a) the establishment of a major long-term research project, (b) the initiation of a faculty-wide T&L colloquium, and (c) the establishment of post-graduate supervision group. These collaborative projects are discussed briefly in turn.

(a) NBT Research project

In recognition that the National Senior Certificate (NCS) results are a poor indicator of students' capacity to cope in a higher education environment, a collaborative research project (by SERG staff from Chemistry, Physics and Extended Studies Unit) has been established in which all Faculty of Science first-year students wrote the well validated and better predictor National Benchmark Tests (NBTs) during orientation-week[1]. The NBTs have been designed to assess the entry-level preparedness of students to cope in higher education in three core areas: academic literacy (AL), quantitative literacy (QL) and mathematics literacy (ML; NBT Report 2018). The tests each have a number of recognisable subdomains which are useful for highlighting specifically strengths and weaknesses. The purpose of obtaining NBT data in this study was therefore to provide individualised, course level and faculty-level data that could be used productively to better support student learning.

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[1] Students are not required to write NBTs in order to gain entry to RU

Outputs so far have been:

- Individual first-year course reports providing information on AL, QL and ML levels of students to subdomain level – discussed In March at a faculty HoDs meeting in March 2019 to consider course level and faculty level responses.
- RU Moodle site with accessible (mainly YouTube) resources at the AL and QL subdomain levels to assist staff and students in addressing problematic issues.
- The appointment of an Honours student (supervised by one SERG member) to do a comprehensive statistical analysis on the NBT and RU course data.

It is envisaged this project will both serve to improve T&L practices as well as enable the publication of academic articles (i.e. enable SoTL). This is work that would not have been initiated without the TAU change project.

(b) Faculty of Science Teaching and Learning Colloquium

In order to work beyond the small CoP, the SERG group hosted a Science T&L Colloquium in June 2019. This took the form of staff presentations on curriculum innovations as part of the review process. Whilst research and evidence-based presentations were encouraged, so too were practice-based ones, in order to enable constructive engagement with the curriculum review and transformation process. Again, this initiative is a direct result of the TAU change project.

(c) Post-graduate supervision group

At the last SERG meeting staff from the Chemistry and Physics departments and the Extended Studies Unit formulated a number of possible science education projects that can be offered in respective disciplines, using Legitimation Code Theory as a theoretical framework. The intention is to support each other as supervisors, to strengthen our theoretical stance by using a common theory, and provide collective support (through presentations and meetings) to students.

Sustainability of the change project

My original TAU was to conduct research on the enabling and constraining conditions of the SERG CoP initiative. For various reasons, outlined in my reflective report, this has changed, but it is still useful to reflect on what makes the CoP work – especially if it is to be sustainable. The two aspects of sustainability discussed here relate to the **informal and collaborative group dynamics** and to the **development of SoTL**.

A number of studies have examined conditions or factors influencing effectiveness in terms of building and maintaining a CoP, most of which relate in some way to group dynamics and relationships between individuals, as well as to broader environmental conditions (see Christie et al. 2007; Cassidy et al. 2008; Abigail 2016; Bozalek et al. 2017). Whilst SERG does not have much control over some of the broader environmental influences at present (such as poor recognition of teaching compared with that of research in terms of promotion, time constraints, etc.), we have given thought to group dynamics and have discussed collectively how we can ensure continued engagement. As such, we wish to maintain a relatively small

group, as it has allowed creation of a 'safe' space in which we can express ideas and even doubts without fear of being belittled or judged.

As one member stated '. . . my experience with [a formal] SoTL [course] four years ago was a most traumatic experience . . . I was reduced to tears by the end of it . . . [and] have not gone back since . . .' (participant 1, meeting 3). A number of studies on professional development have indicated that the role of individual agency plays a key role in professional learning, although how this agency is enacted depends on the individuals concerned (Jawitz 2009; Eteläpelto, Vähäsantanen, Hökkä, & Paloniemi 2013; Tao & Gao 2017). Clearly in the case of the above-quoted participant, the more informal and supportive approach used by SERG has been the appropriate means to encourage and enable her professional development and enactment of individual agency. This appears to be the case with all participants involved.

In terms of development of SoTL, Bozalek et al. (2017) suggest in their study on collaborative enquiry that working together can be productive and take SoTL forward in higher education. The SERG CoP supports this contention as it has developed into a generative space in which both practical and theoretical T&L ideas flow more freely than in our own respective departments. As one lecturer said she 'loves talking to like-minded people about things that interest [her]' (participant 2, June meeting) and another said 'we have generated more ideas and initiated more projects here than in all my years working alone [on educational matters]' (participant 3, November meeting). Furthermore, since we are now working collaboratively on medium-to long-term research projects, we will likely continue in this capacity well into the future.

This TAU project, because it is being instrumental in bringing about positive T&L change in the RU Science Faculty, and will also likely result in short and long-term collaborative research projects, has high potential to be sustainable.

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