

Learning as Accessing a Disciplinary Discourse: Integrating Academic Literacy into Introductory Physics through Collaborative Partnership

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Abstract: This paper examines a collaborative partnership between discipline lecturers and an academic literacy practitioner in the context of undergraduate physics. Gee's sociocultural construct of Discourse is used as a framework for the design of an introductory physics course, explicitly framed around helping students access the disciplinary discourse and social practices of physics. Jacobs' model for integrating academic literacies into disciplines is used as a basis to evaluate the effectiveness of this collaboration, drawing on data from students and staff. The study reveals that an important aspect of the collaboration between the physics lecturers and the academic literacy practitioner was a common, shared understanding of themselves as Discourse teachers. The study also points to wider institutional arrangements that may enable or constrain such collaborations, for example, institutional approaches to academic literacy, departmental cultures and the nature of different disciplinary knowledge structures.

Widening access to undergraduate science and engineering studies is an international concern, with falling enrolment figures in undergraduate programmes. In South Africa, widening access is particularly linked to equity and developmental imperatives (see, for example, Scott *et al*, 2007). Since 1994, the number of black students accessing science and engineering programmes has increased dramatically; however, success rates in these programmes remain very racially skewed (Scott *et al*, 2007). Morrow (1994) has made the distinction between formal access or admission to higher education and 'epistemological access', which is seen as the induction of students into the discourse and practices of their disciplines of study. In the South African context, studies which have examined students' epistemological access into disciplinary discourses include Paxton (2003), Boughey (2005) and McKenna (2004).

In this paper, we describe how Gee's sociocultural construct of Discourse (Gee, 1996) is used as a framework to design the curriculum and pedagogy of an introductory physics course. Making the disciplinary discourse and social practices of physics explicit to students was enabled through a collaborative partnership between the physics lecturers and an academic literacy practitioner. Data from students and staff are used to evaluate the effectiveness of this approach to integrating academic literacy within a discipline.

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Theorising Academic Literacy

Within higher education, academic literacy can be viewed in a number of different ways (Lea and Street, 1998, Boughey, 2002). Common in South African higher education institutions is a "study skills" view of academic literacy, as an autonomous list of transferable generic skills, usually taught in a separate English for Academic Purpose or Academic Literacy module. In this view, academic literacy is conflated with English proficiency or a so-called 'language problem'. A second view of academic literacy is the "academic socialisation" perspective, with a focus on inducting students into the new "culture" of the academy, but in a relatively uncritical way. The third, "academic literacies" perspective, sees literacies as social practices of particular disciplinary communities rather than merely in terms of skill or socialisation (Lea & Street, 1998). In this view, learning entails accessing a disciplinary discourse, as well as maintaining some sort of critical stance towards it, and has close similarities with Gee's notion of Discourse (Gee, 2005).

Gee (2005), one of the key members of the New Literacy Studies group, makes an important distinction between "little d" discourse, which tends to be concerned broadly with language, reading and writing, and "big D" Discourse, which is concerned with broader values and worldviews. For Gee, Discourse encompasses the particular ways of "behaving, interacting, valuing, thinking, believing, speaking, and often reading and writing" (Gee, 1996, p. viii) which characterise a particular community. Gee's use of the capital D for Discourse emphasises that this notion comprises far more than just reading and writing. In the context of physics, for example, the Discourse of physics will encompass the values, attitudes, habits of mind, beliefs and ways of interacting that are particular to physicists in given contexts, as well as the ways of solving problems, reading scientific texts, writing laboratory reports, using various graphical and mathematical presentations, and so on.

Integrating Academic Literacy into Disciplines

Gee (1996) argues that in higher education contexts the role of the academic (the "insider" to the discipline) is to induct students (the "outsider") into the Discourse of a discipline through a process of participation in that particular Discourse community. Jacobs (2007b) questions the notion that disciplinary lecturers are best placed to make explicit the literacy practices and Discourse of a discipline. Drawing on literature in New Literacy Studies and Rhetorical Studies, she suggests that "knowledge of disciplinary discourses has a tacit dimension, which makes it difficult for experts to articulate, and therefore difficult for students to learn" (p. 871). She argues that disciplinary lecturers are so immersed in their discipline that their knowledge of the literacy practices and Discourse features of their discipline is tacit and often taken for granted, and therefore difficult to make explicit to students.

To help make the tacit explicit, Jacobs proposes that collaborative partnerships between academic literacy practitioners and disciplinary lecturers might be a productive way forward:

Because the disciplinary content is foreign, academic literacy practitioners don't get caught up in the meaning, as disciplinary lecturers do. The generic structures and discourse patterns are therefore clearer for academic literacy practitioners than for disciplinary lecturers, who tend to view language as transparent, and read "through" the genres and discourses to get to the meaning. (p. 874)

In such collaborations, the role of the academic literacy practitioner would be to work with discipline lecturers to identify the literacy practices of the discipline more explicitly, and to collaboratively develop classroom activities to make these practices explicit to students.

Jacobs (2007a) has developed a useful model for this collaborative process of integrating academic literacies into disciplines. She notes that this "unfolding model presents factors to be considered when designing integrated approaches to the teaching of academic literacies" (p. 59). The model identifies the following key factors in collaborative partnerships between disciplinary lecturers and academic literacy practitioners: collaborative interactions, nature of relationships, power relationships, and roles and responsibilities.

Jacobs (2007a) also identifies factors influencing lecturers' conceptualisation of academic literacies, including lecturers' implicit theories underpinning their educational principles (eg. knowledge as discursively constructed as opposed to knowledge to be transmitted), the academic literacy discourses prevalent in the particular institution, the characteristics of integration, as well as lecturers' understanding of integration. Her research shows how the collaboration that takes place between the AL practitioners and the discipline lecturers has the potential to transform both the AL practitioners' and the discipline lecturers' understandings of their roles and identities beyond that of literacy or disciplinary lecturer, to include that of *Discourse teacher*.

Making the Discourse of Physics Explicit through Collaborative Partnership

In 2007, extended curriculum programmes (ECPs) were introduced at South African universities, aimed at supporting underprepared students entering higher education. Influenced by current research on academic literacies which pointed to the limitations of stand-alone language courses, the ECP courses in the UWC Science Faculty were designed to include an explicit focus on academic literacy infused into the disciplinary teaching. Two academic literacy practitioners were appointed to support the infusion of academic literacy into two core courses, Physics and Life Sciences. The focus of this study is the collaborative partnership that existed in the Physics Department; however, at certain points in this paper, passing reference is made to the other collaborative partnership.

The AL practitioner and two physics lecturers worked as a collaborative team, meeting weekly to plan teaching and learning activities (each physics lecturer teaches a class of about 70 students). The AL practitioner also attended every lecture, tutorial and practical, and was perceived by the students as part of the physics teaching team. During classes, she paid attention to students' progress; she was free to interrupt the lecturer, to ask questions of clarification, or to elaborate on something which appeared to be taken for granted by the lecturer. The classes were all taught in a flat venue, with students sitting at tables in designated groups; this physical layout was designed to foster interactive engagement in classes.

The course itself is framed around making explicit for students the "little d" and "big D" discourse features of the discipline of physics (see Marshall & Case, 2010, for details). The different verbal, pictorial, physical, graphical and mathematical representations that comprise the disciplinary discourse of physics were highlighted (see also Airey & Linder, 2009, for a description of physics disciplinary discourse). The AL practitioner often foregrounded for lecturers what they were taking for granted—for example, terminology or words used in specific ways in a physics context, symbols, notation or representations not explicitly explained to students, or assumptions made in solving a problem. The AL practitioner also worked with lecturers to scaffold reading and writing tasks, for example, reading assigned texts or writing specific sections of a laboratory report. As a relative 'outsider' to the discipline, the AL practitioner operated as Jacobs describes: she "'lifted' the disciplinary specialists out of their discourses by asking questions that a novice to the discipline would" (Jacobs, 2007a, p. 67).

Considerations of the "big D" Discourse features of physics were also emphasised in the course. Traditionally, introductory physics courses focus on *content*, with little explicit focus on the values, ways of thinking, habits of mind and processes through which scientific knowledge is produced. The course also introduced some critical reflection on the stereotypical portrayal of science as value-neutral, apolitical and asocial; this was done through introducing discussion on the social, political, environmental and ethical dimensions of physics.

Reflecting on the Effectiveness of the Collaborative Partnership

The collaboration between the AL practitioner and physics lecturers led to the formation of a strong teaching team. Jacobs' (2007a) model provides some useful insights into some of the factors that enabled this collaborative partnership. Firstly, the *collaborative interactions* were experienced as very productive by the physics lecturers, helping to identify what they might be taking for granted in their teaching, and what might be hindering students' accessing the disciplinary discourse. As one lecturer noted, the AL practitioner's more limited background in Physics was an advantage: "if she had been at the same physics level as the lecturer, she would have seen things in the *same* way and that wouldn't have been helpful!"

Secondly, the *nature of the relationships* between the AL and physics lecturers was very productive. The team seemed united by a shared educational vision and a commitment to their students; although there were strong personalities in the team and often rigorous debate, this was carried out in a constructive manner. As the AL practitioner noted:

I think what worked was that we had a *common understanding*, we were all interested in the students... So when I interrupted the lecturer—like, "could you explain that again?" or "what did you mean there?"—it wasn't seen as challenging the lecturer, it was because you want the students to follow. After all, you know that the lecturer knows his work! At the end, it's not about us, it's about the students.... So if students are struggling, or come with a gap to the classes, the approach was "how are we going to solve this, *together*?"

The physics lecturers, similarly, commented on the shared commitment of the group:

L1: Everyone had the same goal. We were not afraid to give honest responses (laugh), but it was not taken in a negative light.

L2: Yes, it was constructive criticism.

L1: It was not about the person, but about what we want to achieve in the course—the driving force is explicitly giving students access to physics.

The third factor which Jacobs identifies as influencing collaborative partnerships was *power dynamics*, influenced by notions of expertise. In this team, both the AL practitioner and the physics lecturers seemed quite open to learn from each other; the AL practitioner came with a background in secondary science education, and so, although not a complete "outsider" to physics, felt she had much to learn about physics as a discipline. The physics lecturers, in turn, were eager to raise their awareness of academic literacy issues, and develop their capacity as "Discourse teachers" rather than just as physics lecturers. As they noted, collaboration with the AL practitioner enabled them to give more useful feedback on tasks such as report writing—rather than relying on a tacit sense of writing being 'well-structured' or not, they were made aware of specific writing features to give explicit feedback on.

Furthermore, one physics lecturer commented on how the physical teaching space contributed towards "leveling" power dynamics within the team; the flat teaching space, intended to foster student interaction and engagement, was also a "leveling space" for the lecturers:

A big "plus" [for this sort of collaboration] is the space we use. If we were in a lecture theatre, then it would be [AL lecturer] against one wall, and [one physics lecturer] against the other wall, all looking at the students. Instead we all blend in with the students. It's a collegial space, its not, like "I'm in charge at the front!" It's a leveling space for the students but it also levels relationships between us too."

The final factor was the *roles and responsibilities within the team*. As the academic literacy practitioner noted, it was important that her role within the classes was established and agreed upon at the outset. While the AL practitioner took the lead on certain activities (for example, activities involving reading and summarizing texts, concept-mapping, or scaffolding report-writing), there was no division of labour in terms of the AL practitioner being allocated the sole responsibility for reading and writing activities. Instead, all activities were seen as involving helping students access the various representations of physics. As one physics lecturer commented:

We were all clear about the course philosophy; that it was not to be separate but the academic literacy and everything was to be infused into it all.

Interestingly, the students themselves seemed to regard the lecturers as a team, and they would consult with both the academic literacy practitioner and physics lecturers about assignments and tasks. They seemed to value this collaborative approach, and would ask why other first year modules were not taught in a similar fashion.

In summary, it seemed that one of the key factors underpinning the successful collaboration between the AL practitioner and the physics lecturers was a common, shared understanding of themselves as Discourse teachers, framed by Gee's notion of Discourse as encompassing far more than merely reading and writing.

Jacobs' analysis of factors influencing lecturers' conceptualisation of academic literacies also provides useful insights into factors enabling this collaborative partnership. The first factor she identifies is *lecturers' implicit theories underpinning their educational principles and practices*. In the case of these physics lecturers, they were in a department in which scholarly approaches to teaching and engagement with physics education literature were encouraged. They adopted approaches to teaching that encouraged student engagement rather than transmission of content knowledge, and so were perhaps more receptive to viewing academic literacy not as generic skills but in terms of the social practices of the discipline. The nature of the discipline may have been significant here—physics has historically been the context of philosophical work on the nature of scientific knowledge and has a well-established physics education research community worldwide.

The second factor Jacobs noted as significant was the *academic literacy discourses that are prevalent in an institution*. Although the discourse of add-on English courses 'fixing' students remained fairly prevalent in the Science Faculty at UWC, the university had recently committed itself to a Teaching and Learning Strategic Plan, which had as one of its main strategies to 'enhance epistemological access through supportive teaching and learning programmes and practices that address students' learning needs' (University of the Western cape, 2010). In the Science Faculty ECP, this was seen to point to the importance of explicitly helping students access the discourse of disciplines, through a literacy-as-social-practice approach. The physics lecturers had also been exposed to more current

perspectives on academic literacy through attending several university-wide workshops by visiting academic literacy researchers.

Another significant indicator of the academic literacy discourse prevalent in the Physics Department at the time was the decision within the department to appoint the AL practitioner into a permanent position within a vacant 'technical officer' post; in other words, this seemed to signal an understanding that helping students to access the discourse of physics was as important a part of 'doing physics' as having a technical person to set up the laboratory equipment for physics practicals.

The third factor identified by Jacobs was the *characteristics of integration*. She noted that lecturers new to academia were often more receptive to innovative approaches to integration; in this study, we found that a level of confidence with teaching the disciplinary content was necessary. This enabled the lecturers to move beyond a focus on content-coverage, and to feel confident to try out a different role as Discourse teacher.

Another important characteristic which Jacobs notes for successful collaboration is "a criticality in lecturers regarding the nature of knowledge production in both their own discipline and in other disciplines. Insight into how knowledge was produced within their own disciplines, and the implications of this for teaching and learning, were important characteristics for successful integration" (Jacobs, 2007a, p. 69). As noted earlier, the nature of the discipline may be important - physics has traditionally been the context for historical, philosophical and sociological studies on the nature of scientific knowledge, which may explain why undergraduate physics arguably has a greater focus on the process of knowledge production than some of the more content-focussed undergraduate science disciplines.

Jacobs' fourth factor concerns *lecturers' understanding of integration*. The manner in which the integrated approach to academic literacy was implemented in the Physics course shifted as the collaboration developed. Initially, the activities related to reading and writing in physics were more demarcated in the course—tasks such as introducing students to concept-mapping, or paragraph writing, summarising or report-writing tended to fall in a certain time slot each week and were led by the AL practitioner. Soon the team noticed that certain students were skipping this slot, claiming that they "were first language English speakers" and so these activities were not needed, even though the activities were integrally related to texts being read and produced in the course itself. The team then realised that these activities needed to be reframed more explicitly as physics activities and to be more fully embedded in all lectures, tutorials and assessments—so, for example, concept-mapping was reframed in terms of reading and summarising the next chapter in the textbook, and students' report writing was scaffolded as an integral part of the practical sessions. Reading and writing tasks were also embedded in all tests and examinations.

Discussion

Jacobs' (2007a) model provides useful insights into some of the key factors to consider when designing integrated approaches to the development of academic literacy within discipline courses. This study found that the key factors in Jacobs' model—collaborative interactions, nature of relationships, power relationships, and roles and responsibilities—were useful in characterising what enabled the collaborative partnership between the disciplinary lecturers and the academic literacy practitioner in this context.

Similarly, this study found that Jacobs' (2007a) factors influencing lecturers' conceptualisation of academic literacies—lecturers' implicit theories underpinning their educational principles and practices, the academic literacy discourses prevalent in the particular institution, the characteristics

of integration, as well as lecturers' understanding of integration—were useful in explaining what enabled the infusion model to be successfully implemented and how the lecturers were able to develop in their roles as Discourse teachers.

Jacobs flags the importance of the academic literacy discourses that are prevalent in an institution. In this study, a "literacy-as-social practice" approach to academic literacy had become increasingly prevalent in university discourse, and had been adopted in the Faculty's ECP. This was an enabling factor for the collaboration described between discipline lecturers and the AL practitioner. However, the importance of departmental culture was seen to be crucial, as a mediating factor in whether this university-wide and faculty-wide policy would be adopted in a department or not. For example, the Physics Department in this study was generally supportive of innovative, research-based approaches to teaching and learning; therefore, the ECP philosophy of integrating academic literacy into the discipline curricula was supported by the department, and so the discipline lecturers, in turn, felt supported. Furthermore, the appointment of the AL practitioner in a permanent position within the department signaled firmly a shift from viewing academic literacy as a generic, add-on remedial function to a view of academic literacy as connected to the social practices of physics.

However, it is likely that in departments with more traditional, "autonomous skill" approaches to academic literacy, and with a stronger emphasis on lecturers being content teachers rather than Discourse teachers, collaborative partnerships between AL practitioners and discipline lecturers would be constrained.

Another related aspect of departmental culture was that of the nature of the discipline itself. Certain disciplinary knowledge structures or specific trends (for example, a deeper criticality within the discipline, or a more established tradition of education research in the field) may in fact make collaborations between discipline lecturers and AL practitioners more possible. For example, undergraduate physics may have a greater focus on the processes of scientific inquiry and knowledge production than other, more content-focussed undergraduate science disciplines. This is a potential avenue for further research.

Jacobs' research points to ways to address the pivotal role that departmental culture and hierarchies can play in enabling or hindering educational innovations. She argues for the need for "protected" discursive spaces within institutions—transdisciplinary groups where discipline lecturers can meet and share experiences and develop the confidence to see themselves as Discourse teachers. In the context of supporting future collaborations between discipline lecturers and AL practitioners in the UWC Extended Curriculum Programme, her research suggests that strengthening these transdisciplinary groups will be crucial for the wider implementation of an integration approach to academic literacy within the ECP.

One possible limitation of the collaboration described in this study is the resource-intensive nature of the collaboration—with an academic literacy practitioner dedicated to a single course, this is not easily scaled-up in higher education contexts. However, after a year's input into the course planning and design, and constant presence in all classes, the academic literacy practitioner had developed lecturers' awareness of making explicit aspects of thinking and doing physics which they had tended to take for granted. In doing so, the collaboration has in effect helped to develop the discipline lecturers as Discourse teachers as well. In the subsequent academic year, the AL practitioner became less involved in the course due to her PhD studies, and indications thus far are that her influence continues to be seen in the design and teaching of this extended curriculum physics course. Another beneficial "ripple effect" of the collaboration is the effect it has had on the 'mainstream' first year physics course; some of the learning activities aimed at making the disciplinary discourse more

explicit to ECP students have been adopted in this "mainstream" course too, with the help of the AL practitioner.

Further study needs to be conducted on the long-term effects of such collaborations on the teaching practices of discipline lecturers, and how such collaborations might enable the infusion of academic literacy into discipline curricula not just at the first year level, but in a seamless fashion throughout the undergraduate degree.

Conclusion

In summary, it seemed that one of the key factors underpinning the successful collaboration between the AL practitioner and the physics lecturers was a common, shared understanding of themselves as Discourse teachers, framed by Gee's notion of Discourse. A more narrow view of academic literacy as concerned with "reading and writing" would have likely led to a division of labour between discipline lecturers and the AL practitioner, with the AL practitioner allocated a specific role to develop students reading and writing abilities. Instead, with a more encompassing view of academic literacy, the whole team saw their role as Discourse teachers, helping students access the disciplinary Discourse of physics.

The study supports Jacobs' observations that the collaboration of the AL practitioner and discipline lecturers may be constrained or enabled by wider institutional arrangements. These include, for example, institutional approaches to academic literacy, departmental cultures, and the nature of different disciplinary knowledge structures.

References

- Airey, John, & Linder, Cedric. (2009). A disciplinary discourse perspective on university science learning: Achieving fluency in a critical constellation of modes. *Journal of Research in Science Teaching*, 46(1), 27-49.
- Boughey, Chrissie. (2002). Naming students' "problems": an analysis of language-related discourses at a South African University. *Teaching in Higher Education* 7(3), 295-307.
- Boughey, Chrissie. (2005). "Epistemological" access to the university: An alternative perspective. *South African Journal of Higher Education*, 19(3), 230-242.
- Gee, James Paul. (1996). *Social linguistics and literacies: Ideology in discourses* (2nd ed.). London: Taylor & Francis.
- Gee, James Paul. (2005). *An introduction to discourse analysis: Theory and method* (2nd ed.). London: Routledge.
- Jacobs, Cecilia. (2007a). Towards a critical understanding of the teaching of discipline-specific academic literacies: Making the tacit explicit. *Journal of Education*, 41, 59-82.
- Jacobs, Cecilia. (2007b). Mainstreaming academic literacy teaching: Implications for how academic development understands its work in higher education, *South African Journal of Higher Education*, 21(7), 870-881.
- Lea, Mary, & Street, Brian. (1998). Student writing in higher education: An academic literacies approach. *Studies in Higher Education*, 23(2), 157-172.
- McKenna, Sioux. (2004). A critical investigation into the discourses used to construct academic literacy at the Durban University of Technology. Unpublished PhD thesis, Rhodes University.
- Marshall, Delia, & Case, Jennifer. (2010). d/Discourse in the learning of physics: The design of an introductory physics curriculum, *African Journal of Mathematics, Science and Technology Education*, 14(2), 23-37.
- Morrow, Wally. (1994). Entitlement and achievement in higher education. *Studies in Philosophy of Education*, 13, 33-37.

- Paxton, Moragh. (2003). Developing academic literacy in economics in a South African university, *Literacy and Numeracy Studies*, 12(2), 1-14.
- Scott, Ian, Yeld, Nan, & Hendry, Jane. (2007). A case for improving teaching and learning in South African higher education. *Higher Education Monitor*, 6. Pretoria: Council on Higher Education.
- University of the Western Cape. (2010). UWC Strategic Plan for Teaching and Learning.

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