

CHAPTER 5

“HIDDEN FEATURES” AND “OVERT INSTRUCTION” IN ACADEMIC LITERACY PRACTICES: A CASE STUDY IN ENGINEERING

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Project-based report writing is currently a regular academic literacy practice in Portuguese medium Engineering Programmes at the University of Minho (UM), Portugal. Such work aims to position students as professional engineers building scientific and professional knowledge. However, one recurring problem in the writing of the project based reports is the gap in understandings and expectations between students and teachers about the forms and norms governing the reports. This gap in understanding has been highlighted in “academic literacies” work more generally (Mary Lea, 2004; Mary Lea & Brian Street, 1998; Theresa Lillis, 2006) and the question of how we might address this gap is the focus of this contribution. Specifically, my aim is to explore the extent to which “overt instruction” (The New London Group, 2000) on report writing as a genre can resolve the gap in understanding and whether features considered to be often “hidden” in pedagogy (Brian Street, 2009) can be addressed through overt instruction (see Street, Lea and Lillis Reflections 5 this volume).

Two main questions motivated my pedagogic research and analysis:

1. Are “hidden features” inevitably constitutive of academic literacy practices?
2. Can overt instruction disclose the features hidden in academic literacy practices?

THE PEDAGOGIC CONTEXT AND THE INTERVENTIONIST ROLE OF THE “LANGUAGE EDUCATOR”

Between 2010 and 2011 I worked on an Industrial Engineering and Management (henceforth IEM) Integrated Master’s Degree Programme at the University of

Minho, Portugal. I was invited by the teachers to work as an Assistant Researcher at IEM between September 2010 and January 2011 in order to support the students and the teaching staff in producing and disseminating the outcomes of project reports. In total 12 teachers (subject specialists), four educational researchers working alongside the teachers and six student groups with seven students in each were involved. I was one of the “educational researchers” and the only person specifically focusing on language and literacy: the teachers explicitly sought my cooperation—as a “language educator.” Considerable effort overall was put into supporting the programme and the students’ activities.

Students in their first semester of the academic year regularly work with a Project-Based Learning (PBL) methodology to develop technical competencies associated with four particular courses. A Project Based Learning (PBL) methodology typically involves students working on a group project drawing on a number of disciplinary fields (Sandra Fernandes, Anabela Flores, & Rui Lima 2012; Natascha van Hattum-Janssen, Adriana Fischer, & Francisco Moreira, 2011). In this course, the PBL involved four key disciplinary/ knowledge areas: industrial engineering, calculus C, computer programming, and general chemistry.

The project in this instance was entitled Air₂Water and the task was to design a portable device capable of producing drinking water from air humidity. The final report writing that students needed to produce had a word length of 60 pages, including three main sections—Introduction, Development and Final Remarks. Students were provided with a “Guide” and a list of assessment criteria which included the following: clearly stated objectives, a clear structure, evidence of sound

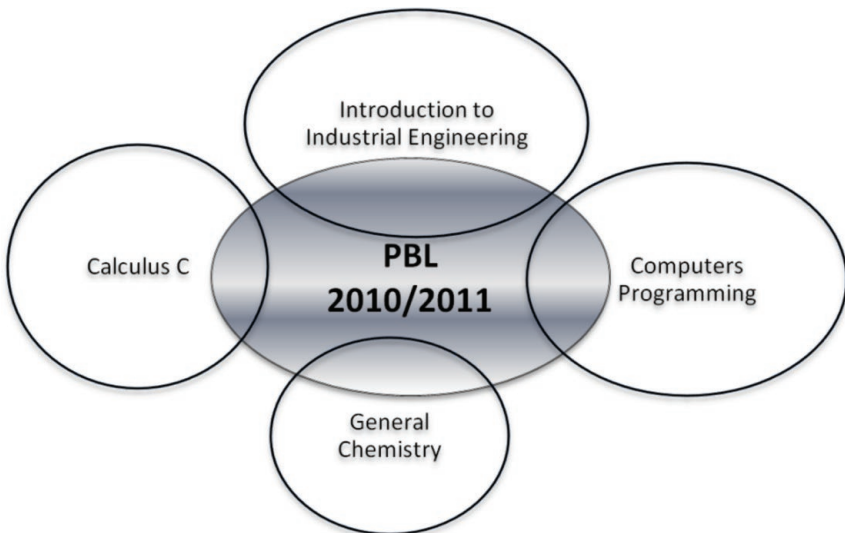


Figure 5.1: Courses involved in the PBL methodology.

reasoning and conceptual rigor, evidence of the capacity to reflect and engage in critical analysis with group members, appropriate use of formatting and layout, and appropriate referencing. Overt instruction with regard to academic literacy on the part of the teachers included the formulation and sharing of these explicit assessment criteria and giving oral feedback on reports at different stages of drafting. However, it was considered that additional overt instruction in academic literacy was needed in order to narrow the gap in understandings between students and teachers which led me to develop, with another educational researcher, three key “interventions” to take place at three key points in the 19 week course (see Figure 5.2 for schedule). The first involved a workshop focusing on the groups’ spoken presentation of the project, the second a workshop focusing on the writing of the project report, and the third a series of sessions with each group where I fed in comments and concerns by teachers and listened to students’ perspectives on their writing. The goal of these interventions which took the form of workshops involving students and teachers (see for example, Figure 5.3) was to provide additional overt instruction in language, discourse and writing conventions that seemed to remain hidden despite explicit guidelines and teachers’ oral feedback throughout the programme of work around the project.

As I discuss below, the interventions constituted an additional form of overt instruction. However, it’s important to note that they also made visible specific features of this particular literacy practice that had remained more deeply hidden, often to both teachers and students. Drawing on academic literacies ethnographic

Course Schedule	Course Tasks and Workshop Interventions
Week 2	(1) Pilot Project presentation
Week 5	<i>Intervention 1: speaking in public</i>
Week 5	(2) Project Progress presentation
Week 7	<i>Intervention 2: the written report</i>
Week 8	(3) Intermediate Report (max. 20 pages)
Week 9	(4) Extended Tutorial
Week 12	<i>Intervention 3: individual sessions with each group—talk around written report</i>
Week 13	(5) Preliminary draft of the final report (max. 30 pages)
Week 18	(6) Final Report (max. 60 pages) (7) Delivery of Prototype (Portable Device)
Week 19	(8) Final Exam (9) Final Presentation and discussion (10) Poster Session

Figure 5.2: Course tasks and workshop interventions.

approaches (see for example Lea & Street, 1998; Lillis, 2001, 2008) I sought to tease out these more hidden features using the following tools: observation of academic literacy practices within course based instruction, analysis of preliminary and final drafts of project reports, and reflections (mine and teachers') on the intervention workshops. In the rest of this paper I outline the programme of work, the specific workshop interventions I designed and facilitated and discuss brief data extracts drawn from one of the six groups of students at IEM, working together to produce a project report.

PROJECT REPORT AT IEM: OVERT INSTRUCTION AND HIDDEN FEATURES

The project was developed over 19 weeks; it had ten key pedagogic tasks—designed by the subject specialists—and three workshop “interventions” (see Figure 5.2).

The first draft of the project report was handed in by the students in week 8. Until that moment, overt instruction had been given in different ways: the students had received assessment criteria and oral feedback (based on the assessment criteria) from the teachers on student presentations. Giving oral (rather than written) feedback on this programme is in line with feedback practices in higher education more generally in Portugal. The teachers' oral feedback comments on presentations had involved several recurring criticisms. These included: 1) lack of justification for the choices and decisions that were made; 2) lack of explanation about what was innovative; and 3) lack of critical reflection. What's important to note here is that the teachers were both critical of the students for not fulfilling these expectations and therefore meeting the assessment criteria, but also concerned about how to provide adequate support to enable students to meet such criteria. In a fundamental sense, the specific nature (conceptual and discursal) of these three elements that teachers were critical of were hidden in some ways to teachers as well as to students. In a meeting (week 5), one of them stated how difficult it was to “manage feedback,” and it was agreed that “giving students written feedback” might be helpful.

Given the concerns that the oral feedback were proving insufficient to support the students in developing the three elements mentioned above in their reports, I designed a workshop where I aimed to explicitly raise and address teachers' concerns (see Figure 5.3).

After the workshop, Group 2—the group I am focusing on in this paper—made efforts towards responding to the concerns raised. For example, in their draft report they explicitly signaled the innovative nature of their project:

Because this project is complex and innovative, it needs good

management and staff organization. (Intermediate Report¹);

and they wrote that their goal was:

... to lead a creative and dynamic project that can make a difference in the market ... to contribute to finding a solution in a responsible and realistic fashion. (Intermediate Report)

The explicit mention of creativity and dynamism—and the contribution that the project seeks to make—indicated that the group understood to some extent the teachers’ expectations about explicitly marking innovation. The group also provided some justification for their choices and decisions pointing to the need for “good management and group organization.”

They also made efforts towards signalling group processes and collective group decision making, an element that is mentioned in the assessment criteria and one that teachers were looking for:

A proposal was made to create a company At first, Angola and Sudan were defined as target markets ... it was concluded that there was no average relative humidity in that country, hence this option was discarded. (Intermediate Report)

Reference to the group processes that were involved are signaled in phrases such as:

Areas of Focus	Questions/Activities
Report Planning	Target audience? Project objectives? Group objectives? Requirements for project design? Assessment criteria? How to make explicit group decisions about the structure of the project?
Making sense of teachers’ comments (from Week 5)	Need to clarify: steps of the project; justifications for decisions; explanation of innovative nature of the project: organise the sequencing and cohesion of paragraphs and sections; aligning of objectives with the overall report and the introduction with the conclusion. Analysis of excerpts of a successful report (2009/2010)
Argument and Discourse Features	Academic language; types of arguments; discourse modalisation.
Report Introduction	Contextualisation? Objectives? Introduction and overview of sections?
Report Conclusions	What is innovative about the project? How is knowledge from the four areas integrated? Benefits of the type of teaching/learning to the group? How is the critical positioning of the group signalled linguistically?

Figure 5.3: Intervention workshop, week 7.

“were defined ... as target markets,” “it was concluded,” and “hence.”

ONGOING TEACHER CONCERNS AND TEASING OUT HIDDEN FEATURES

While all the groups’ reports indicated evidence of progress towards responding to teachers’ comments, by week 9, teachers still had major concerns about the project report writing. In an extended tutorial (week 8) these concerns surfaced when each group presented their written report—accompanied by an oral summary—to seven teachers of the programme. In this tutorial the seven tutors who had by this stage read the “intermediate” draft of the project report discussed their concerns with the group members. I observed all tutorials and recorded the feedback from the teachers to students. Based on a transcription of their feedback, key ongoing areas of concern were as follows:

- Lack of focus and coherence across sections of the report
- Lack of sufficient integration of course content from the four subject areas (see Figure 5.1)
- Insufficient discussion of the proposed device
- Need for greater clarification about the innovative nature of the project
- Need for clearer justification for the different decisions made

Because these comments by teachers were recurrent and the students were not succeeding in responding in ways expected while writing the intermediate report, I consider it useful to describe them as “hidden features” in this particular pedagogic context; as already stated these features were hidden from both the teachers/tutors and the students. The teachers did not explicitly articulate what they meant, e.g.,

	Talk Around the Intermediate Report
	(1) Integration of course content areas. How is this evident in the Table of Contents and in the report sections?
	(2) Textual coherence. What is the “common thread” of the report?
	(3) Where and how is innovation signalled? What are the arguments or the justifications associated with the portable device and the objectives of the project?
	(4) Critical view of the work and the results. Where is it signalled?
	(5) Introduction. How is the theme contextualised? Are the objectives of the group and the project presented? Is the structure of the sections appropriate?
	(6) Conclusions. What can be highlighted as innovative in the study? Was the group able to integrate the content areas? How? Are there any limitations to the study? What are the benefits to the group of this type of teaching/learning? What are the benefits of PBL from a technical-scientific point of view?

Figure 5.4: Intervention workshop 3: Talk around the intermediate report.

how innovation could be shown and evidenced in the project report and the students could not grasp what the teachers felt they were intimating. Rather, teachers made evaluative comments about what was not being achieved, leaving students guessing at what teachers seemed to actually require.

Based on the comments in the extended tutorial with teachers, I designed a third intervention workshop (week 12): this involved talk with students around the Intermediate Report. I designed the workshop discussion with students around the

Table of contents week 8 (group 2)	Table of contents week 18 (group 2)	<i>Additions made</i>
<p>Introduction. Project Management. Phases of Project Management. Project Specification. Project Planning. Leading Techniques and take meetings more informal. (see sections 1, 2—week 18)</p> <p>WE—Water Everywhere. Methods of Production. Objects of production. Tools. Transportation Methods. Production management. Optimization of production. Labor Service. Area, volume and length. (see sections 6, 7, 8, 9—week 18)</p> <p>Theoretical Framework. (see sections 4, 5—week 18)</p> <p>Target market and Relative Humidity. (see sections 6, 7, 8, 9—week 18)</p> <p>Enterprise Management Softwares. (see section 12—week 18)</p> <p>Conclusion.</p> <p>Bibliography</p> <p>(Intermediate Report, Contents, week 8)</p>	<p>1—Introduction, 1.1) Project Framework; 2—Project Methodology and Management and Team Management; 2.1) Project Management; 2.2) Team Management;</p> <p>3—Potable Water treatment method; 3.1) Thematic Framework;</p> <p>4—Understanding the Process of Obtaining Water from Air humidity; 4.1) Introduction, 4.2) Advantages and disadvantages;</p> <p>5—The Water; 5.1) Molecule of water; 5.2) Molecular Structure of Water and its physical properties; 5.3) Chemical equilibrium and condensation; 5.4) Salt concentration in water;</p> <p>6—WE-Water Everywhere; 6.1) A We, the Logo and Slogan; 6.2) Target Market and Relative Humidity; 6.2) Plant location; 6.3) Product: AirDrop; 6.4) Plant Departments; 7—Production System; 7.1) Production factors; 7.2) WE’s Productive System; 7.3) Enterprise Deployment Overview;</p> <p>8—WE’ Process manufacturing and Dynamics of Production; 8.1) Manufacturing Cycle Analysis and Rate and Production; 8.2) Time Crossing; 8.3) Productivity; 8.4) Labor service Rate occupancy; 9—Health and Safety; 9.1) Factors affecting health and safety; 9.2) Number of extinguishers and evacuation routes;</p> <p>10—Cost Analysis; 11—WE’s Energy Resources Optimization;</p> <p>12—Prototype LEGO’s Mindstorms;</p> <p>13—WEP—Water Everywhere Program;</p> <p>14—Conclusion; 15—Bibliography.</p> <p>(Final Report, Contents, week 18)</p>	<p><i>Industrial engineering</i></p> <p><i>Critical dimension</i></p> <p><i>Chemistry</i></p> <p><i>Critical dimension</i></p> <p>Integration of 4 subject areas (Industrial engineering, Chemistry, Calculus and Computer Programming) in outline of production of innovative project.</p> <p><i>Critical dimension</i></p> <p><i>Calculus</i></p> <p><i>Critical dimension</i></p> <p>Computers</p> <p><i>Critical dimension</i></p>

Figure 5.5: Changes in report focus as evident in table of contents.

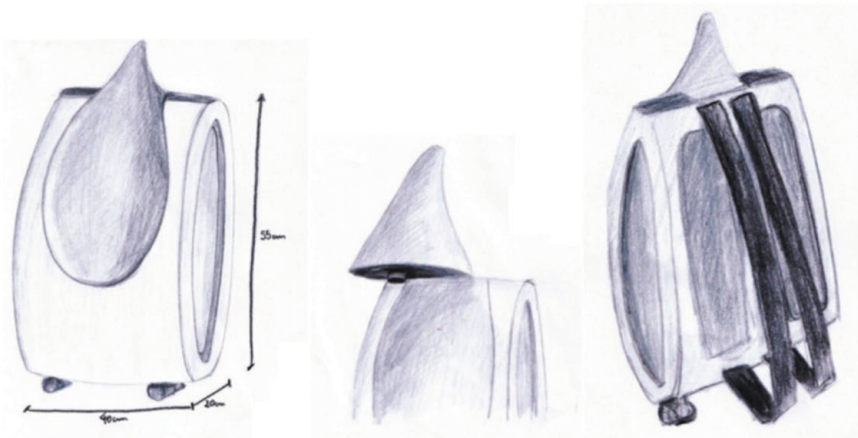
key concerns expressed by teachers (see Figure 5.4).

In the Intervention Workshop 3, where students and I talked through key points derived from teachers' comments and concerns, students were able to recognize some of the concerns of teachers that I presented to them. For example, following discussion of the teacher comments in relation to their specific report, one student reflected on the changes they had made while also mentioning the difficulties they continued to face:

We have added sections—in the Contents and in the Report—that were missing. The relationship between some aspects—“the common thread of the Report” was not noticeable ... Related to the area of Introducing Industrial Engineering we wrote about project management, we wrote all the techniques. But, in addition, we have to apply the concept of chemical equilibrium, for example, our equations, our experiments, our device. I think it's quite difficult. I feel that in PBL—we need more help. (Student 1).

Indications that the workshop intervention helped students produce a report more aligned with the assessment criteria and teacher expectations can be illustrated by comparing a table of contents at week 13 with one at week 18 (see Figure 5.5). Some of the key changes are listed in Figure 5.5.

However even at this stage students said that they struggled to make sense of the comment for the need for “clarification about the innovative nature of the project”.



Strengths: easy to construct and to carry with backstraps, facilitates easy access to any situation and space

Weaknesses: if the material used to construct the device is heavy and/or if too much water is in the portable device, it may damage people's backs

Figure 5.6: Strengths and limitations of the device.

They felt that innovation—the way that they proved that the device was really portable—was already clearly stated in their report:

We were **the only group to explain certain aspects**. In one of the oral presentations, we mentioned that we believe our device is different from those of all other groups. We were **the only group that effectively worked with the portable device** This was **our understanding of innovation** ... (Student 3: emphasis added)

The group had also presented images of the device (named “AirDrop”) as well as showing weakness and strengths (see Figure 5.6).

Following both overt instruction from subject specialists and three intervention workshops, students were both making progress towards understanding expectations as evidenced both in their report drafting and talk around their writing, but students were also still confused about why and how they were failing to meet teacher expectations.

DRAWING CONCLUSIONS FROM THE PROJECT

I opened this paper with two questions:

1. Are “hidden features” inevitably constitutive of academic literacy practices?
2. Can overt instruction disclose the features hidden in academic literacy practices?

With regard to the first question, on the basis of the programme and the considerable intervention discussed here, I would argue that hidden features are inevitably constitutive of academic literacy practices. Subject specialist and teachers often “know” what they are expecting students to produce but: a) they are not used to articulating such discursive knowledge; b) it may be that it is far from clear what the nature of the knowledge expected is—this may be particularly the case when the knowledge to be produced cuts across disciplinary and theoretical/applied frames of reference, as in project based learning; and c) the ideological nature of literacy practices—that is, the doing of any literacy practice inevitably involves fundamental issues of epistemology (what counts as knowledge here now) and power (who can claim what counts as knowledge) even though this ideological nature of literacy is not acknowledged. Furthermore, the dominant autonomous model of literacy (Street, 1984) encourages a transparency approach to language and a transmission understanding of language pedagogy (Lillis, 2006) whereby both teachers and students assume that taking control over language and knowledge making is (or should be) a relatively straightforward issue. But as this pedagogic research study indicates, this is far from being the case. Teachers in this project were aware that they were not articulating what was required and unsure of how to do so. They

were also frustrated at the students' incapacity to act on explanations. At the same time, students were convinced that they had produced what was required but their voices were not listened to in some key moments of the process. Students also recognized some of the difficulties they faced without necessarily having the resources to resolve them.

With regard to the second question, I collaborated with the PBL teachers and designed specific interventions aimed at making visible the academic literacy practices required in this specific context. These were partly successful, as evidenced by the changes students made to reports, the decision by teachers to use additional forms of feedback in future programmes (to include written as well as spoken feedback) and a general awareness raising of the many aspects of producing a report that are not easily or quickly communicated. The interventions also signaled the limitations in overt instruction: after a range of interventions involving overt instruction, at the end of the programme students still did not understand why their reports failed to do what was required and important gaps between students and teachers perspectives—for example whether “innovation” had been explicitly signaled—remained. Producing knowledge from across a number of disciplinary boundaries is a complex task: ongoing dialogue between teachers and language educators and students, facilitated by ongoing research into perspectives and understandings, as was begun to be carried out in this project, would seem to be the most promising way forwards.

NOTE

1. All data extracts and extracts from course materials have been translated from Portuguese into English.

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