Journal of Academic Writing
Vol. 3 No. 1 Summer 2013, pages 1-14

Reflections on an Integrated Content and Language Project-Based Design of a Technical Communication Course for Electrical Engineering Students

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Abstract

Effective ways of teaching technical communication skills to engineering students have been much discussed. This article reflects on one setting, a first year course in Technical Communication at a university in Sweden, where electrical engineering teachers, language and communication teachers and student counsellors work in close, team-based cooperation using a project model which requires the students to analyse, implement and communicate technical problems. The paper discusses the change in this course - from an EAP course primarily prioritizing language training which ran parallel with a project course - to one unified ICL course. The progression is described through the changes in the organization of the course, and the article focuses on one learning activity: interdisciplinary tutorials on project reports. Through a pilot study where these sessions were video recorded and mapped, we conclude that the presence of different roles became an asset for the range of what the students see as relevant for their project report. In particular, the technical report genre was critically analysed, including problematic areas such as textual sequencing and display of technical problems; data visualisation and commentary; and referencing.

Introduction

The demands for engineering students to have good communication skills, both from industry and higher education boards, are well documented (Ford 2004, Poe, Lerner and Craig 2010, and Reave 2004). There have been different ways of approaching this at university level. One way is the increasing number of courses with communication elements such as report writing and presentations. Another way is including communication courses as part of the curriculum in many university engineering programs. A recent study by Reave shows that of 73 top-ranked US and Canadian engineering schools, about 50% of the US schools and about 80% of the Canadian schools require a course in Technical Communication (2004: 452). In Europe, language for specific purposes (LSP) courses have become increasingly

popular partly in response to the dominance of research in English, particularly in technical fields, and the use of English as the corporate language by major companies (Räisänen and Fortanet-Gomez 2008).

In communication tasks aimed at engineering students, it is advisable to use tasks that are as authentic as possible, both to better equip students for the workplace and to motivate the students with a relevant assignment (Artemeva, Logie and St-Martin 1999, Dannels 2000, and Poe, Lerner and Craig 2010). This is also seen as a way to introduce the students to their future disciplinary field. By performing tasks relevant to the disciplinary field, the students develop an understanding of the expectations of these practices. In some instances, it is a content teacher who gives and assesses the disciplinary-typical assignment (cf. Paretti 2008). In other cases, the students meet a communication teacher in a separate course and work with tasks typical for the discipline in a language setting (cf. Artemeva, Logie and St-Martin 1999). However, it has been shown that there are limitations to both approaches. In the first approach, the risk is the assumption that transfer will happen automatically between the task and reality when that is not always the case (Dannels 2000: 25, and Paretti 2008). In the latter approach, the risk is that the teacher does not have sufficient knowledge and therefore is not seen as a trustworthy audience or assessor for the text (Patton 2008: 313).

With a view to addressing this kind of dilemma, the article reflects on a course's development from being a separate, add-on communication course in the first year of an electrical engineering program to a course integrating content and language (ICL) at a technical university in Sweden. One key reason for this development was to make an obligatory course more meaningful to the students who take it, an approach which has been followed with several other programs at our university. In particular, the article focuses on one instance, the tutorial, where small groups of students meet both content and language teachers at the same time for feedback on report drafts. In a pilot study of the tutorial, the following questions were addressed:

- What kinds of issues did the students address in this integrated setting?
- What kinds of issues did the teachers address in this integrated setting?

These questions were investigated by mapping these tutorials in order to investigate whether the change from an EAP to an ICL course in this context, seemed to provide a more meaningful environment for these students.

Reasons for Integrating the Technical Communication Course

The electrical engineering department at Chalmers University of Technology has long recognized that communicative proficiency in English is an important skill for their students to master. Initially, first year students had a project course and a communication course which were two quite separate entities where the students followed a project with teachers from Electrical Engineering and studied language and report writing in the communication course (as shown in Table 1 below). In the second part of the communication course, there were joint tutorials on the students' reports (two report drafts) and both sets of teachers were present at the final oral presentations.

Table 1. The Two Courses in 2002, Technical Communication and Project Course

	Technical Communication	Project
Aim [1]	The aim of the course part is to prepare students to write and present reports in English without making elementary grammar and pronunciation mistakes. The course also aims to raise students' ability to read technical texts in the area of electrical engineering.	The course gives participants a chance to meet regularly with a teacher at the school when conducting project work in groups of eight.
Assessment	Grammar exam Oral presentation of report Individual written assignment	Report (pass / fail)
Activities	Grammar exercises Writing exercises Lab work (pronunciation) Report writing	Meet with a teacher once a week to work with project
Meeting place	Division for Language and Communication	Electrical Engineering

Although the aim was integration, with the communication course contributing to the project course, in reality both teachers and students saw the two courses as quite separate and there was little communication between the teachers from the different departments. Part of the reason for this was that there were around 200 students at that time and therefore many teachers involved. The fact that there was little communication meant that the students would receive input on the report from two different angles and this information was sometimes seen as contradictory. Another issue was that there were many different kinds of projects, depending on the teachers' research interests, ranging from the practical (building an amplifier) to the theoretical (working out a mathematical equation). This made the documentation quite different, depending on which type of project was carried out.

When it came to the tutorial sessions, one group of eight students met their content teacher and a language teacher to discuss their text. However, since the content and language teachers had no contact before or after the tutorial, the feedback was based on the respective areas of expertise, that is the content teacher focused on information that needed to be clarified and expanded and the language teacher focused on the grammar and writing proficiency issues which were the main aim of the language classes. Since the projects differed in topic area, comments on report structure remained generic on the whole. The tutorials were teacher-run, meaning that the teachers dominated the discussion.

Reave (2004) identifies five methods of what she calls authentic integration where the course involves both a language and a content teacher: partnership, team teaching, communication modules, expert feedback and communication across the curriculum. The first, partnership, involves faculty from the different disciplines planning, delivering and evaluating the course. The second, team teaching, involves both groups of teachers acting as coaches and consultants. The third, communication modules, involves adding a separate, one credit module to an engineering course. The fourth, expert feedback, involves the students getting language feedback on their content reports. The last method, communication across the curriculum (CAC), describes communication that takes place throughout the program – and beyond the individual course. Reave describes this approach as 'ambitious' and rare (2004: 466).

In our scenario, the course developed from offering expert feedback to a partnership arrangement (from an EAP course to an ICL course). It is also important to note that this course is the first in a series of integrated courses in the degree program, including a second year course in environmental and power technology and the third year Bachelor thesis, all of

[1] These aims are taken directly from the archived course descriptions as published on the university website.

which involve both content and language teachers. In that sense, this course is also part of CAC (Reave 2004).

Part of the motivation for changing the course is what Russell (2003) describes as a double bind where students want to produce what the teacher wants in order to fulfil the requirements of the course but are frustrated and confused by those requirements, especially if they seem to contradict their existing views on how that assignment should be done. This can particularly be the case with writing, since it can seem on the surface that familiar terms such as report, introduction and conclusion are being discussed yet these concepts are genre dependent and an awareness of the genre is necessary in order to produce that text type successfully. Ford (2004) also warns of the dangers of teaching genres as products so that students use them as templates; suggesting instead the use of genres as a starting point for discussions.

In our case, the first year students had carried out 'research' projects and written reports at upper secondary school so were aware of some of the terminology. In some cases, there was the feeling that this technical communication course was a repeat of upper secondary school and that they were not learning anything new.

Airey (2011: 3) defines disciplinary literacy as 'the ability to appropriately participate in the communicative practices of a discipline' and suggests that disciplinary literacy in undergraduate programs is designed to function in three main areas: the academy, the workplace and society. Each of these sites can also be divided into local and international. Our first year students need to be aware, for example, of technical report writing both in the academy and in the workplace and be able to produce such reports both in Swedish and in English. They also need to be aware that for the workplace, communication often takes place within a project model and therefore demands particular formats and routines.

One way of bringing the student into the disciplinary field is discussed by Jacobs (2007). She suggests that it is difficult for the content teacher to do this alone since once practices have become naturalized, it is difficult for the individual to describe how the naturalization process took place. Therefore, she argues, the language teacher can hold a critical position in the role of novice in the field and pose relevant questions to bring out the tacit knowledge that is not so clear to the students. Paretti (2008: 500) sums this up with 'we need to help students understand the "why" of communication, because only then can they begin to grasp the "how".'

The Present Design of the Technical Communication Course

In brief, the technical communication course changed from being an English for Academic Purposes (EAP) course to an Integrated Content and Language (ICL) course. The aim was that the students should work on an engineering project with an engineering teacher but at the same time also reflect on how and why certain ways of working, documenting and reporting were relevant. In this way, we wanted to explicitly attend to the language and communication level of what they engaged in through their project assignment.

One important change is that two teams involving one group of language teachers and one group of electrical engineers became one team. This is due to the fact that the two original courses officially became one course, that is, they share the same course code. In essence, the roles of content and language teacher have continuously become less distinct with the two parties working in closer cooperation. These roles have been facilitated by the adoption of a project model called LIPS (Linköping Interactive Steering Project Model)[2] (2010) where the team uses the project model to coordinate tasks. More detail on how this was achieved is shown in Table 2:

[2] The LIPS model is a project model developed at Linköping University, Sweden, particularly for educational use.

Table 2. The Technical Communication Course[3] in 2011

	Language component	**Content component**
Aim	Carry out, document and report a technical project in English Systemize project work	
Assessment	Grammar exam Oral presentation of report Individual critique of another group's report	Report (pass / fail)
Activities	Report writing and structure Process writing Grammar exercises	Project meetings including: Writing a project brief Having project meetings including minutes
Meeting place	Division for Language and Communication	

Another important change was a very practical one: language teachers and content teachers meet students in the same building at the same time (half the students with one teacher for half the time then change around). This makes it possible to have more consistent coordination within the team. Teachers regularly meet during the breaks to talk about what is happening in the course and can communicate similar information to the students in the different groups. This also means a clearer distribution of responsibilities between teachers and more of a joint perspective on the students' work. In addition, this organization makes it possible to sometimes teach together. The student groups have been reduced from eight students to four students to facilitate communication within the group.

To summarize the changes in the course from 2002 (Table 1) to 2011 (Table 2), both parts of the course now share the same aims. Due to the project model, the project work has become more systematized with the content teachers becoming responsible for some written assignments (project briefs, meeting minutes) as opposed to previously when most of the writing tasks were seen as the domain of the language teacher. There has also been a shift in focus in the activities in the communication classroom from a focus on practicing mechanical skills such as grammar, pronunciation and sentence structure to a focus on communication tasks in meaningful contexts. In practice, this meant some of the tasks remained the same but that the focus was different.

The Project and Project Model

All of the student projects concerned solving issues of supplying power to an island with a rather varied topography. While half the groups were involved in designing the electrical power transmission system between producer and customer, the other half were dimensioning and investigating the production of the electrical power, with a main focus on renewable energy. This meant that the students were all involved in aspects of the same problem and the expectation was that they could easily relate to one another's projects.

The main activities of the project assignment were to investigate the power distribution problem, produce a group report and then to present the results individually to an audience of their peers from a mixture of groups. In all of these tasks, the LIPS project model and its templates could be used as guides to help the students formulate their work. What is more, the project assignment was designed so as to require the students to work on several sub-tasks and texts at the same time (see Figure 1).

[3] The title of the course is Technical Communication, which includes both the language and the content component.

Since there were many aspects to deal with, the students also needed to divide the work between the group members while still maintaining a common view of the scope of the task to be solved. The role of project leader was divided equally among the project members in that all members had to take their turn on a weekly basis.

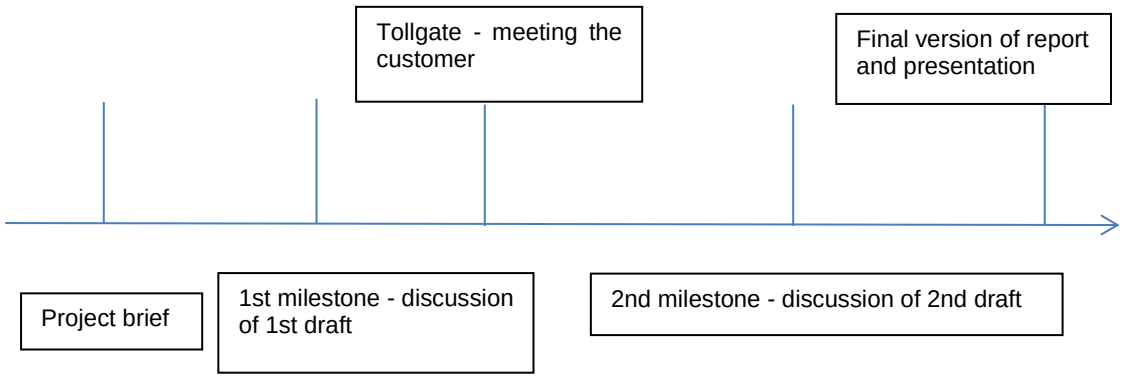

Figure 1. Timeline showing the progression of activities in the Technical Communication course

As mentioned previously, there were a number of key deadlines, so-called *milestones,* in the LIPS model where the students presented and received comments on their work so far. These were organized as integrated tutorial sessions where two groups met two teachers and discussed their projects. At the same time, other students in the class met with a student counsellor to reflect on the process of working in a group and dealing with any issues arising there. In addition, halfway through the project, the groups met the 'customer' in a *tollgate*, another lecturer who had not been involved as a teacher, to give presentations of the current stage of each of the projects. During this session, the students had the opportunity to reflect, present and discuss the project at an early stage, and this process gave the teachers a valuable insight into how the project was progressing within the group. This information could be used to further help project groups where less progress had been made and adapt the tutorials accordingly.

The Investigated Setting: Project Milestones Operationalized as ICL-designed Tutorials

The project model milestones were designed as joint tutorials. The tutorials provided a situation where the disciplinary fields of language/communication and engineering intersected in concrete ways since many dimensions of engineering practice were addressed in relation to the students' technical report documents. Therefore the tutorials were the focus of a pilot study to investigate the effect of this integrated approach on the course.

The aim of these sessions was for the students to give and receive feedback on their reports in order to move forward with their projects. These were organized as follows: two teachers, one content and one language, met two groups in one room for 45 minutes. The sessions were student-led and, in order to do this, the students were asked to read each other's texts and prepare a set of comments according to requirements (see Appendix 1). In their preparation, they were asked to consider issues such as the content and structure of the text, and to a lesser degree, the language. For the second milestone, they were also asked to write an individual critique of the report they had read which they handed in. This also served as exam practice since their final graded assignment also involved writing an individual critique of another group's report.

On the same day as they had their report tutorials, the groups also met with a student counsellor to discuss how the group was functioning. These sessions referred back to a group contract that all members negotiated and signed at the beginning of the course (also in the LIPS model) detailing how they would work together on the project. In that sense, the tutorial was an opportunity to give and receive feedback on their projects as participants in the project but also to reflect on the progress of the project, i.e. to step back and critically evaluate their progress.

The procedure of the tutorial was as follows (see Appendix 1):

1. Group 1 presented their work in progress
2. Group 2 offered their comments on Group 1's report
3. Teacher from Electrical Engineering offered additional feedback and comments
4. Teacher from Communication offered additional feedback and comments

In this way, the students were more active in the tutorial session which focused more on their concerns. The second tutorials were video recorded and the following section describes the procedure used for investigating this material.

Study Design

The second tutorials were filmed and analysed to find out the kinds of topics that were discussed in the tutorials. In particular, we were interested in the issues the students chose to focus on in fulfilling their project task. The initial step in the analysis was to transcribe six out of fourteen video recordings in terms of verbal contributions. The six recordings were randomly selected with three taken from one of the two sets of teachers, and three from the other set. This transcription process provided a way to identify and categorize a set of topical themes addressed and developed in the tutorials. To create the thematic map (Appendix 2), we designed a template where we used the sequential organization of the tutorial as a starting point, i.e. we mapped topical contributions made by the different roles in the tutorial and at what stage they occurred.

The next stage was to observe how themes were developed across the tutorials, i.e. how themes were initiated and established across the roles of student writers, student responders, content teachers and language teachers (see Appendix 2). With the intention of getting a closer look at the tutorial as an ICL-setting, we applied categories to the mapping similar to the terminology in the student instructions for separating 'content issues' from 'language issues'. We approached the transcribed video recordings again by observing at what point in time and by what role themes were introduced. This resulted in a clearer picture of how the themes were initiated and how they were followed through.

This analysis is preliminary and has limitations in terms of reliability. The mapping has not been checked by an external observer for example. However, it does serve its purpose of providing an overview of the kinds of topics discussed.

Results

In mapping the video recordings, a key question was whether the changes in the course from an EAP to ICL course had provided a more meaningful learning environment for the students involved. In particular, it was interesting to see the issues that the students chose to focus on.

What kinds of issues did the students address in this integrated setting?

Overall, the students, both as writers and responders, followed a general procedure that we had taught of commenting on text, even though the second drafts differed considerably. They

were also very active in leading the tutorials; on average the students talked for at least 50% of the sessions.

In the role of report writers, the students were expected to comment on the status of their reports by describing how far their work had come (see Appendix 1). What was observed in all of the analysed tutorials was that the students explained what they had done by describing what was there, what was missing, and what was difficult. Structure was a key topic in terms of where information should be placed and which sections needed more work. To a lesser extent, groups also commented on problems in finding information. One group also discussed style and whether their report was too formal. Consequently, the students focused on describing the status of their report as they had been instructed (see Appendix 1).

In the role of student responders, the students were expected to account for their reading experience. They generally framed those comments in a way similar to the writers. All groups opened their response by offering some positive feedback before discussing some of the content. Comments included referencing; illustrations; sequencing of text sections; text sections' correspondence with text types such as introductions; relevance of information; and how different sections of the text were related to each other.

In particular, the students questioned the relevance of some of the information included and noted missing information or calculations. There were also structural questions concerning the positioning of some sections and suggestions for numbering sections. Over half of the groups brought up referencing in terms of the formatting and missing references. Most of the groups commented on the illustrations in the report and two of the groups mentioned style in terms of the fact that the report contained different styles from different authors.

What kinds of issues did the teachers address?

As teachers, we represented different disciplines in the tutorial session: electrical engineering, and technical communication. One overall observation was that despite the fact that the tutorials took place with two different sets of teachers and in two different languages (English and Swedish), the issues raised in the tutorials and the processes followed were similar.

Typically, the content teachers focused an equal amount of attention on three issues, namely content, structure and formatting. The first two were often in relation to what the students had brought up themselves in terms of missing information and discussion of the purpose of the report. The third was information from the teachers on handling of figures in the report in terms of data commentary and labelling and also comments on the units used. To a lesser extent, the content teachers commented on unfinished references and encouraged a critical stance to the sources they had.

Commonly, they pointed to possibilities for what was already present in the student texts by referring to specific formulations and sections that could be made productive. They instructed the students about how such formulations could be made more functional, for example, by using specific source material or presenting more detailed calculations. These kinds of instructions also concerned how formulations could be turned into more detailed explanations. Content teachers also suggested alternative calculations and formulations, and, in particular they explained technical terminology.

The language teachers primarily focused on content, structure and referencing and to a lesser extent, the procedure of the tutorial and project. In terms of content and structure, this was often once again in relation to issues that had been brought up by the students. The language teachers also focused attention on the purpose of the report and how the introduction and discussion section should reflect this purpose. In terms of referencing and procedure, the teachers referred the students to guides on the course webpage for referencing, upcoming deadlines and the criteria for the tasks. What was interesting was that language was rarely discussed by the language teachers. The students received written language comments in their reports, which they received during the tutorials, but did not ask questions on grammar or phrasing in the tutorials.

What are addressed as major, joint issues by both parties?

The third stage of analysis involved identifying the discussion themes which became major issues in the tutorials. For this purpose, we returned to the video material with the purpose of identifying areas where all four roles were engaged. This resulted in identifying five key issues as shown below with a concrete example of each.

1. *Explicit accounts for the work done*
2. *Textual display of technical problems*
3. *Relevant uses of the assignment description*
4. *Textual sequencing of the presentation of the problem*
5. *Referencing*

1. Both student writers and responders were oriented to providing explicit accounts of their own work as an assignment in itself and deciding what the tutorial should focus on. In one example, the group discussed terminology and the peer group questioned the use of the term 'heads between 400-600 meters' when talking about wave power since they were unclear what was meant. The student writers confirmed that they also felt uncomfortable with this term, though they had looked at several different sources. The content teacher could confirm that they had the correct term for that context. This was typical of the process in the tutorials; a question was raised, responded to by the peer group and then discussed further by one of the teachers.

2. The textual display of problems was a major concern in all tutorials. This concern was typically framed as related to the ways in which calculations and figures had been used for making a claim or for providing information. More specifically, this had to do with how mathematical expressions could function as narrative components in the text; how calculations could be qualified; how figures were designed and what figures were displayed.

   One group, for example, had a problem with the length of the report and asked for help in removing information. The comment they received from one of their peer group members was 'The target audience is politicians, try to make it easier for them to grasp, shorten it down'. Receiving this comment led to a discussion of how simplifying information to reach an audience might be done. The same student, for example, suggested putting information in tables, which led to a discussion of the role that tables and figures can play.

3. In some tutorials, students and teachers engaged in discussion of how the assignment specification and a concrete reality clashed. This problem occurred as students explained that some assignment specifications were irrelevant for the kind of problem they were working on, or in relation to the solution of their specific technical problem. This concern generally made students and teachers orient themselves to the differences between the educational and the engineering context.

   One example of this was a group who wanted to know if they should include health issues in their text. The project instructions required it but it was not relevant in their context. This led to a discussion of the requirements of the task and how realistic they were.

4. Structure related concerns were related to what information was presented in the text and in what order information was organized. One group, for example, queried the placement of the discussion section in their report. They wanted to place it at the end of the report after the conclusion but the peer group commented that the discussion section should come before the conclusion section. The content teacher considered this point and the fact that in this instance, the students were focusing on the conclusion in the discussion section so it seemed to make sense to have a discussion section there. The language teacher then continued with input on a typical report structure, noting that discussions tend to come before conclusions and why that is. Thus, the logic behind the template became more visible to students.

5. Students commonly framed referencing as a concern related to the formatting. This resulted in discussions about what standardized systems could be used. In response to such situations, the teachers elaborated the functions of different referencing systems.

   One example is a group who had used a numbering system (Vancouver) where each reference had a number and was then listed at the end. The peer group commented that they had been asked to use the author date system (Harvard) in the report and therefore that the group needed to change their references. The language teacher remarked that both systems would be acceptable as long as they were used correctly, and the content teacher could give personal examples of publications where the different systems have their advantages. Hence, what is often a frustrating exercise for the students (following a reference system that can seem to have fairly random requirements) became an active discussion point where they started to see the logic behind the requirements and decide for themselves why a certain system might be useful.

Discussion

In mapping the video recordings, a key question was whether the changes in the course from an EAP to an ICL course had provided a more meaningful learning environment for the students involved. Ford (2004) outlines two major implications for communication instruction in the engineering curriculum from her study of knowledge transfer across disciplines. These are:

1. Avoid teaching genres as products
2. Cue students to see connections between contexts
   a. Provide opportunities for student reflection
   b. Provide opportunities for students to learn from each other's processes and approaches
   c. Commit ourselves to learning and using a common vocabulary in the classroom
   d. Emphasize that writing tasks are part of engineering tasks

Paretti (2008) has a similar list to support meaningful learning in the classroom. Both lists emphasize the 'why' of writing rather than the 'how'. The goal is to work with writing as a process so that students become aware that there is not a 'fit-all-size' template that can be learnt and applied in all circumstances but rather that writing changes to fit new situations and that the writer has to adapt accordingly.

1. Avoid teaching genres as products

   As shown in the examples above, the genre of technical report was very much questioned during the tutorials. Discussions such as where sections could be placed suggest that the students had their purpose clear and wanted to adapt the report accordingly. The resulting discussion in the tutorial displayed the logic behind this order in the report so giving students an insight into the 'why' behind the report structure.

2. Cue students to see connections between contexts

   The tutorial sessions provided students with the possibility of learning from each other's processes and approaches. In the second tutorial focused on here, the students met different groups than they had in the first tutorial. This gave them an insight into different ways of approaching the project and different understandings of the demands of the project. As described above, some groups actively oriented to what kind of information the fictive audience would need in the report, which contrasts

to Dannels' experience where the students made it explicit that the only audience they focused on was the teacher despite instructions to do otherwise (2000).

An individual written assignment where the students were asked to comment on another group's report in a critical way also provided the opportunity for reflection. In this assignment, they were asked to discuss their expectations of a technical report and how far the report they read matched these expectations.

Finally, the presence of content teachers in the room who had worked and were working as engineers, enforced the fact that writing tasks are part of engineering tasks. The content teachers were able to share experiences about expectations and processes in writing technical documents.

Conclusion

The necessity for engineering students to have courses in technical communication has been raised in several places (Ford 2004, Paretti 2008, Poe, Lerner and Craig 2010, and Räisänen and Fortanet-Gomez 2008) but there are also dilemmas about how to do this in ways which make students aware of and involved in the challenges that communication involves. Compulsory courses that students do not necessarily see the reason for, can challenge both teacher and student (Russell 2003). One issue can be whether the content teacher or the language teacher is best placed to address those challenges. By using an ICL approach in this course, the students were made aware both of the demands of their disciplinary practice and of the importance of mastering those demands.

As Jacobs (2007) discusses, this is not always the best option or an easy one. Many factors need to work before an approach like this can be successful such as discussions on roles and responsibilities; power dynamics; applications of learning and collaborative interactions. Successful relationships take time to establish, maintain, and develop and both parties need to feel they have something to gain from the arrangement. Not all teachers are ready to share the classroom with teachers from another discipline.

In the technical communication course discussed here, the change from an EAP course to an ICL one was a motivating and worthwhile change for all parties. Tutorials have evolved into active, fruitful discussions with students who take an interest in and responsibility for their texts in a different way than before. In course feedback, students commented about the time the course took since they put so much effort into discussing and revising their written texts.

To sum up, enabling first year electrical engineering students to encounter communication teaching in this way involved a multi-faceted approach with many skills to be taken into consideration. In using a project model, teachers and students are involved in working on a project in a very relevant way which can provide the students with tools both for university and professional life as long as they are given the time and help to process this information.

Acknowledgements

The authors would like to thank the anonymous reviewers for their constructive comments.

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Appendix 1: Proposed Agenda for 2nd Tutorial

This is a copy of the instructions given to the students before the tutorial.
45 min for 2 groups

1. **Group #1 present their work so far for about 2 mins, based on the following bulleted points:**
    a. Title and purpose of work
    b. Table of contents – present the logic of your structure and explain how you believe the text is structured
    c. Status – what is missing, what will be added to the final version?
    d. What would you like comments about?

    (**max** 2 mins)

2. **Group #2 offer their comments (their critique) on Group #1's report based on the report criteria** (here written as instructions to Group #2):
    a. Which sections of the report are best linked to the purpose stated in the introduction?
    b. Is the content easy to read and understand, i.e. does it take the audience into consideration?
    c. Can you follow the argumentation and the technical descriptions? Give examples of sections that can be improved, or examples of clear and interesting text.
    d. Are the pictures/figures/tables presented in a clear way, so that they add readability to the report? That is, do they improve your understanding of the content? Do you think that additional figures would improve the report further and in that case where should they be added?
    e. Give examples of where the structure of the report can be improved (if any). Is the report structured in a logical way? Are the titles and sections named in a logical way?
    f. Point out sections/chapters where the language of the report is consistent and informative and, if applicable, sections where improvements can be made. Focus on the content and to what extent the text is written 'with one voice' and disregard grammar/vocabulary.

    (5-10 mins)

3. **Tutor from Electrical Engineering offers additional feedback and comments to report.**

    (5 mins)

4. **Tutor from Language and Communication offers additional feedback and comments to report.**

Appendix 2: Mapping Instrument

The tutorial session

TEXT 1: Group A1

Students presenting their text/work	**Students responding to peers' text**	**Electrical Engineering teacher**	**Language and Communication teacher**	**Joint concerns handled in the tutorial**
Structure: no table of contents but intended structure in the text Referencing: poorly handled Contents: missing calculations for energy losses 'health' is included but seems awkward corona charges probably handled in the wrong way lightning and shortcut protection missing Referencing: difficult finding trustworthy sources (mostly manufacturers) Writing work: written comments about mistakes and gaps in the text	Structure: confirms a visible overall structure Style: different writers – different kinds of English Illustrations: useful illustrations confirms placement of figures identifies missing picture Structure: change order of text sections Display/ readability: mixing text and calculations Summing up: contrasting peer document with their own	Format: missing title page and abstract Structure: response to previous comments about structure, points to possible alternatives References: accounting for facts Contents: formulating a line of reasoning calculations as reasoning Format: colour coded vs. black/white diagrams Referencing: the reference list is missing Contents: corona discharges Format: how to handle figures and captions	Contents: formulation of problem introduction and formulating an introduction Structure: sequencing the document Writing work: process for producing text Referencing: how to display references what examples and guidelines are useful	*Explicit account for the work so far:* writers present their view of the document and account for their work as individuals commenters present their individual views on the peer text *Textual display of problem:* function of calculations and visualizations amount of calculations displayed *Relevant uses of the assignment description:* clash between the assignment requirements and the problem being dealt with *Organizing the presentation of the problem:* structuring the reasoning *Presenting technical phenomena:* how concepts are handled (the corona effect; three phase systems) *Textual display of problem:* figures amount of text *Referencing:* the display of references