Designing and Implementing Content-Based Courses in English with a Non-Language Faculty at a Public Colombian University*

Diseño e implementación de cursos basados en contenido en inglés con docentes no expertos en lenguas en una universidad pública colombiana

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This article reports the findings of an investigation into the experience of a group of eight professors from undergraduate programs in hard sciences who participated in a multi-site study to implement content-based (CB) courses in English. The professors, who had a high level of proficiency in English, worked in collaboration with language faculty. The data gathered from focus groups, class observations and in-depth interviews reveal some factors which influence the professors' teaching practices, and the academic and professional gains they derived from this experience. Founded on the results, the researchers propose a mentoring program that supports professors in the development of CB courses in English.

Key words: Content-based teaching in EFL, mentoring programs, professional development

Este artículo presenta los resultados de una investigación sobre la experiencia de un grupo de ocho docentes de pregrado de ciencias exactas y naturales quienes participaron en un estudio de caso múltiple para implementar cursos de contenido en inglés. Los profesores, quienes tenían un alto nivel de competencia en inglés, trabajaron en colaboración con docentes de lenguas. Los datos que se obtuvieron de los grupos focales, de las observaciones de clase y de las entrevistas a profundidad muestran algunos de los factores que influyen en sus prácticas pedagógicas y los logros académicos y profesionales que se derivaron de esta experiencia. A partir de los resultados, los investigadores proponen un programa de apoyo tutorial que apoye a los docentes en el desarrollo de cursos de contenido en inglés.

Palabras claves: Enseñanza del inglés a través de contenidos, programas de desarrollo profesional, desarrollo profesional

Introduction

At the *Universidad de Antioquia*, a public research university, there are a growing number of subject area professors who are highly knowledgeable in their field, proficient in at least one foreign language and who are willing to merge into one course these two areas of their expertise. A group of faculty researchers from the School of Languages recognized the potential in this situation and decided to attempt to organize, within the context of the undergraduate programs of the university, a framework for constructing content based curricula that simultaneously promoted the learning of a foreign language.

This kind of experience has been documented by scholars in other EFL contexts (Rosenkjar, 2005; Stewart, Sagliano & Sagliano, 2005) but at public universities in Colombia, there is little evidence of this approach. Thus, the process of planning and implementing content-based (CB) courses at university level in a foreign language context becomes an alternative that challenges the grammar translation and communicative methodologies that prevail at most levels of education when learning a foreign language (Freeman & Freeman, 1998; Díaz, 2002). In addition, factors such as limited access to resources and the restricted possibilities for using the language for meaningful purposes (González et al., 2002) highlight the need for more critical reflection on the EFL teaching approaches used in Colombia and for the discussion of proposals that respond to the reality of this context.

The main aim of this paper is to examine the possibilities of developing a mentoring program for non-language faculty to teach CB courses. This includes an account of (a) the mentoring sessions conducted with non-language faculty, (b) the factors that influenced the teaching practice of the eight participant professors when implementing the content courses in English, and (c) the gains non-language faculty claimed to derive from this experience. The paper concludes with a proposal, drawn from the research, with guidelines for carrying out a mentoring program that would enable subject area professors to enhance their teaching practices when implementing this kind of methodology.

Literature Review

In this section, the principles that support CB teaching, the models and strategies teachers require to balance language and content in their classes, as well as the holistic impact this methodology has on both teachers and students, will be elucidated.

The socio-psycholinguistic orientation is the foundation of the CB methodology under a common umbrella of principles related to learning, social issues, teaching, curriculum, and language, which contribute to the holistic development of both young and adult learners (Whitmore & Goodman, 1996). Learning is defined as an ongoing process, unique for each learner, which occurs in supportive, collaborative contexts where life experiences of learners are valued and related to learning experiences. Therefore, teachers consciously work to create a sense of shared involvement, supporting learning opportunities that invite students to participate and assume

responsibility for their own learning. The curricular framework for these processes is a dual integrated curriculum that advocates the construction of knowledge and concepts, at the same time that it builds thought and language. Language is therefore understood as the medium of communication, thought and learning when it is comprehensible and authentic, and when it promotes cognitive development and serves real purposes.

This grass-roots movement is described and defined by individual teachers according to their professional and personal background. The work of Lev Vygotsky (1934, 1978), Louis Rosenblatt (1978), Brian Cambourne (1988), John Dewey (1938), Kenneth Goodman (1986,1996), Halliday (1985), Frank Smith (1998) and Yetta Goodman & Ann Marek (1996), as well as the experiences of scholars in the field of foreign and second language learning and teaching at different levels of education, such as Yvonne and David Freeman (1994,1998), Katiuska Salmon (1998), Adelina Arellano (1992), Amparo Clavijo (2000) among many others, provide the foundations for the implementation of CB teaching.

As mentioned above, in CB teaching, it is evident that the essence of human learning for either adults or young learners at all school levels entails the company of experienced learners for the construction of knowledge and language. Cambourne (1988) identified a group of conditions that are rooted in the natural process that takes place in all kinds of learning. The author states that *immersion* is required to constantly illustrate learners with samples of those issues they are going to learn; accompanied with ***demonstrations*** performed by significant others who are more experienced learners in the community on how to make use of those tools available. Learners should see this display of models as 'doable' and meaningful in order to be ***engaged*** in the learning process with delineated ***expectations*** *expressed by both the apprentices and the experienced learners. Both of them* evidence mutual commitment through acts of ***responsibility*** to the process. ***Approximations*** to the conventions of language ***use*** and knowledge construction are encouraged because supportive ***responses*** will be provided by *more knowledgeable learners*.

Besides considering these conditions, teachers in EFL settings should bear in mind the benefits they may derive from the expertise and knowledge students have already acquired in their native language to implement CB methodology. Cummins (1996) argues the existence of a Common Underlying Proficiency (CUP) opposed to a Separate Underlying Proficiency (SUP). He explains that the academic concepts or the skills acquired through one language build a CUP that can be accessed and enriched as learners incorporate different language systems. The information does not lie completely separately in the brain; therefore, what an individual learns in one language is not restricted to that sign system and is transferred among languages, as it is required by the language user.

For curricular purposes, the array of possibilities teachers have available as regards the programs, models, and approaches for integrating language and content in second and foreign language

settings ranges from a tendency to highlight language in the adjunct model, in theme-based courses, and in language classes with frequent use of content for language practice (Snow, 1993; Brinton et al. 1989; Genessee, 1994; Met, 1999); to those that emphasize content in immersion and sheltered courses.

According to Stoller (2002), planning lessons for CB courses requires teachers to allow students to derive a deeper content knowledge and better language skills since, as Cummins also clarifies, content and language learning are reciprocally related. Stoller presents a set of techniques teachers may use to balance language and content in their classes. Those strategies are as follows: 1. Extended input, meaningful output, and feedback on language and grasp of content. 2. Information gathering, processing, and reporting. 3. Integrated skills. 4. Task-based activities and project work, enhanced by cooperative learning principles. 5. Strategy training. 6. Visual support. 7. Contextualized grammar instruction. 8. Culminating synthesis activities.

Experiences in EFL settings have revealed that where content and language specialists worked together to teach CB courses there is a need for a professional orientation program on language teaching and learning, since many of the professionals in other fields have not taken any methodological course that demonstrates the "use of active learning approaches and discipline in CB language teaching" (Stewart & Sagliano, 2005, p. 30). In the implementation of CB courses, teachers are encouraged to participate in a learning continuum that, unlike training courses, favors long-term reflections about principles, methods and strategies that empower participants to make their own informed decisions (Woodward, 1997).

The Study

The methodology followed in this project was a multi-site case study (Yin, 1994, Tellis, 1997) framed within an interpretive paradigm (Arnal et al. 1994, Pring, 2000) given that the language faculty researchers tried to understand how the science professors from three different settings experimented, perceived, modified and interpreted the educational practice they were experiencing.

The specific research question that guided this part of the study was the following:

How can faculty from hard sciences benefit from a mentoring program in the process of designing and implementing content-based courses in English with the support of language faculty in the undergraduate programs at a public university? Among the objectives of this project, the language faculty researchers considered the design of a framework for mentoring non-language faculty in CB teaching and learning methodologies.

Data Collection

Before starting the project, four science professors were observed while teaching their regular courses in Spanish in order for the language faculty researchers to get acquainted with their methodologies. Similarly, they were observed while they taught their content courses in English. Throughout the project, the role of the

observer was non-participatory. The language faculty researchers designed an open format in which they took into account student-student and teacher-student interaction as well as the resources employed in the course and the different strategies the science professors implemented (See Appendix 1). In the School of Veterinary Medicine, there were seven members of the language faculty research team (three students and four professors) who took turns observing those classes. They observed 10 out of 16 sessions of the course. In the Chemistry Institute, seven members of the language faculty research team (two students and five professors) took turns and observed 10 of the 16 sessions. In these schools, the observations were carried out approximately every two weeks. In the School of Microbiology, nine language faculty researchers (three students and six professors) took turns and observed 15 of the 16 sessions devoted to the course, which means that the language faculty researchers observed weekly. Observations in the three schools were mostly done by two different observers at the same time; nevertheless, sometimes there was only one observer due to schedule restrictions. The notes taken during the class observations and the mentoring sessions helped for the triangulation of the data gathered. When the courses finished, focus group sessions (Debus, 1988; Dendinger, 2000) with the science professors and students were held in order to obtain their perspectives on the development of the courses and to triangulate the information gathered in the observations. Finally, in-depth interviews (Kvale, 1996; Berry, 1999) were conducted

with the science professors in order to validate the data gathered and, also, to confirm some specific aspects about the processes they underwent as professors, learners, users of the foreign language and about the support of the language faculty researchers (See Appendix 2).

Data Analysis

At the beginning of the project an *a priori analysis* (Freeman, 1998) helped in the definition of concepts such as curricula for CB, acquisition of English, collaborative work and mentoring that would be the crucial points during the project. The focus groups and the in-depth interviews were tape recorded then transcribed. Each researcher had an individual reading of those transcriptions to pre-establish the categories. Recurring themes were recognized and emerging categories (Freeman, 1998, Altrichter et al. 1993) were defined concerning teachers and students in terms of tensions in collaboration, students' linguistic improvement, students and teachers' beliefs, and non-language faculty professional development. This consensus was reached based on several group discussions and having taken into account the saturation found in the data. Then the language faculty researchers decided to form some sub-groups to deepen the analysis of those specific categories. This article presents the results concerning that of non-language faculty professional development. The language faculty researchers triangulated the data obtained from the instruments and derived some interpretations (Freeman, 1998, Burns, 1999). Finally, the results were disseminated

in the university and in some academic events at other institutions.

Context

The *Universidad de Antioquia* is one of the biggest in the country with more than 30,000 students and one of the leaders in research in most of the academic fields. The main language of instruction is Spanish but learning a foreign language is fostered in order to facilitate academic exchange with the international academic community and expand the cultural and personal horizons of the students. For undergraduate students, it is mandatory to certify proficiency in reading comprehension in a foreign language either by taking the two level course offered by the School of Languages, by taking a test designed at the university or, by demonstrating a passing score on an international standardized test in order to get their degrees. They may also study different foreign languages to develop their communicative competence through a 400-hour course sponsored by the presidency of the university. Professors are required to demonstrate proficiency in the FL through an average score on standardized tests in order to be hired as fulltime instructors. The School of Languages also offers several possibilities for faculty to learn and improve their language proficiency in a FL.

Participants

In this experience, eight fulltime professors from three different schools at the university, namely the School of Veterinary Medicine (four professors), the Institute of Chemistry (one professor)

and the School of Microbiology (three professors) worked collaboratively with the language faculty researchers from the School of Languages to design and implement the content courses. All the science professors fulfilled the requirement of having a high proficiency level in English. There were 26 students[1] attending these courses. They fulfilled the requirement of having an intermediate level of communication in English necessary to follow the course. There were 12 from the School of Veterinary Medicine, seven from the Chemistry Institute and seven from the School of Microbiology. The demographic information of the science professors who participated in the study is provided in Table 1.

The language faculty research team was composed of six fulltime professors, one adjunct teacher, three undergraduate students from the foreign language teaching program, and two professors that joined the research group for this project from two other universities. The group met once a week for four hours in order to discuss theoretical aspects concerning the project, to exchange ideas about classes observed, to design, implement and evaluate the mentoring sessions and to analyze the data collected in focus groups with the science professors and the students. Initially, two of the researchers were in charge of conducting the mentoring program and giving feedback to the science professors. The whole group, including the undergraduates, attended the weekly meetings, read the articles, and took

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1   This article does not provide a lot of information concerning the students since the authors only concentrated on professors' professional development.

Table 1. Demographic information of the participative professors

Name*	Last Degree	Languages Spoken	Language Learning Experiences	Teaching Experience	Course Taught in The Research Project
Bertha	Ph. D**	English, French and German	Emphasis in French in high school. Immersion in Germany and France.	30 years	Physiology of Animal Reproduction (from the School of Veterinary Medicine)
Sara	MS**	English and Russian	Immersion in Russia	Non obtained***	
Marcela	Ph. D**	English and French	Emphasis in French in high school. Immersion in Canada	Two years	
Camilo	Ph. D**	English and French	Language institutes in Colombia and immersion in France	Seven years	
Sebastian	Ph. D**	English	Language institutes, self-access materials and immersion in England	Six years	Colloidal Systems (From the Chemistry Institute)
Rodolfo	MS	English and French	Language institutes, assistantship in France, self-access materials	Two years	Assessment in Molecular Diagnostic (From the School of Bacteriology)
Lucia	MS**	English	Immersion in England and USA	Four years	
Linda	Ph. D**	English, French and Portuguese	Self-access materials and immersion in USA	12 years	

* Fictitious names were used to protect professors' identities
** Studies pursued abroad
*** Limited information was obtained from this professor since she enrolled in a doctoral program abroad during the last stage of the project..

turns participating in the data collection process and their subsequent analysis. The students had the extra task of transcribing the data gathered from the instruments and writing the minutes of the meetings.

Mentoring Sessions and Implementation of the Courses

The language faculty researchers designed and implemented a 20- hour framework for mentoring on CB teaching and language teaching strategies that varied from course to course as the language faculty researchers gained expertise in this kind of professional development, and learned to adapt the logistics for each school. Most of the time, sessions were conducted in English by the language faculty researchers, and the science professors felt compelled to use the foreign language amongst themselves. These sessions were aimed at opening academic discussions about this collaborative task and were adjusted according to faculty availability, questions and expectations.

The following were the basic aspects the language faculty researchers considered for these sessions:

–   A historical account of foreign language teaching philosophies and methodologies, from grammar translation to the socio-psycholinguistic orientation.
–   An overview of the principles that support teaching language through content.
–   A set of guidelines for designing a CB course.
–   A compilation of learning strategies, classroom management techniques and graphic organizers.

During these sessions, the science professors made personal connections with

their own experiences as language learners and with the strategies they use in their teaching practice.

In the School of Veterinary Medicine, these sessions were held before the implementation of the course, and the program was designed at the end of these sessions where the language faculty researchers and the science professors established linguistic and content goals (See Appendix 3). This four-hour course was held once a week and the science professors chose the topics and the sequence to teach the content. The language faculty researchers offered students advisory sessions to support their linguistic process but, due to time and public transportation constraints, they could not attend.

In the Chemistry Institute, one of the researchers addressed the specific queries of the professor in non-structured meetings since he adapted the program from the same course he usually teaches in Spanish; in fact, he was the only professor who did not show variations in his strategies for delivering his courses in Spanish or English, probably because of the fact that he learned English in a very formal way; similar to the way you learn mathematics or science. Then he could have considered that his course in English did not need any adjustments. Besides, it is important to mention the fact that from the science professors involved in the study, he and Lucia are the only ones who speak just one foreign language, so they have been exposed less than the other professors to a foreign language learning process. Students attended this course twice a week for two hours. Duties related to their program did not allow them to attend advisory sessions.

In the Microbiology School, initial sessions focused on the general topics designed for these mentoring sessions and on evaluating the program the science professors had previously designed for this course. Essentially, the content addressed topics that were new for the students. In order to provide them with challenging, but not overwhelming, learning opportunities, Rodolfo, one of the science professors, suggested organizing the program around themes students were already familiar with. Actually, he spontaneously endorsed this without having acquired any formal knowledge of the psycholinguistic approach which asserts that one of the ways in which efficient learning can be induced is by working on topics students are already familiar with.

Once the course started, the two-hour mentoring sessions were held every two weeks during the sixteen-week course. These sessions opened discussions about logistics, feelings and ideas connected to teaching strategies they were implementing and to the outcomes of the individual feedback sessions after the class observations. The four weekly hours assigned to this course were split into two two-hour sessions, one for the content with the science professors and the other for an adjunct course (Snow, 1993) led by the language faculty researchers.

Findings

The implementation of these three courses revealed a variety of patterns concerning the language learning processes of the science professors as well as the issues related to their professional development.

The factors that influenced the construction of their beliefs about learning and language learning, as well as the influences on their practices, were elucidated through the in-depth interview then triangulated with the information derived from the observations and mentoring sessions. These professors also acknowledged the positive aspects they added to their teaching practices and to their process as language learners as a result of their participation in this new teaching scenario.

Factors

The language faculty researchers noticed that the way the science professors named and described their methodology derived from their previous experiences with learning and teaching in their specific field, as well as from their methods of learning a foreign language. Clavijo (2000, p. 22) asserts that professors' past experiences "[…]are a very important way to compile teachers' knowledge and to understand their practices and their social, historical and cultural values". Those stories also "provide information and tools to understand how their education may influence the education of future generations".

Having been involved in immersion and demonstration (Cambourne, 1988)

exercises abroad, as part of their academic careers, the professors thus embarked upon this project with pre-existing expectations about the learning process. Significant others around them played different roles responding to their attempts as they tried to use the foreign language in academic or informal situations. Engagement, the condition that Cambourne (1988) and Smith (1981) explain as the one that initiates any learning process, was a constant factor, maintaining the belief of these professors that they could become successful doers of the process which was demonstrated to them. Furthermore, Freeman & Freeman (1998) offer an explanation of the circumstances that may have influenced the current teaching practices for CB courses in this group of professors in five categories under the question: *What influences how professors teach?*

In order to explain the learning processes of the science professors, the language faculty researchers analyzed their past experiences, both educational and academic. Using this analysis they were able to conclude that the influences on the participants' processes as foreign language learners and as teaching practitioners could be grouped under four headings: academic experience, materials used, colleagues and

Table 2. What influences how professors teach?

Past Experience	Educational Experience	Colleagues/ Administrators	Changes in Teaching Situation	Materials
Teach as we were taught	Teach as we were taught to teach	Teach as others teach, or as we are required to teach	Adjust teaching to new school or level or new students	Teach using available or required materials

administrators and, finally, changes in teaching circumstances due to academic demands.

Academic experience

a.   Past experience

The experiences of science professors as foreign language learners at high school level, and in undergraduate and graduate programs in their specific fields, both in Colombia and abroad, provided them with some insights into the roles teachers and students play in class. As high school students, Rodolfo, Camilo, Sebastian and Linda learned English with notional-functional methodologies; Lucia in an immersion experience abroad; and Bertha and Marcela learned French through the content of their school subjects.

Rodolfo and Camilo learned English in regular high school courses, and both English and French in private institutes and with self-access resources where the emphasis was on the conventions of the written language. As oral interaction was scarce, this aspect became a challenge when living and studying in France. Their communication needs prompted them to take risks in the company of other foreigners, creating a Zone of Proximal Development (Vygotsky, 1978) that facilitated understanding, and meaning construction both in academic and informal conversations. As a result of these experiences, both professors encouraged discussions, presentations and the use of classroom language in their CB courses to encourage an oral proficiency that,

according to them, will allow students to participate in international events.

Bertha and Marcela studied all their elementary and high school subjects in French. The relevance of the interactions they had in the foreign language through the curriculum, and outside the school when they met with peers, became more evident during their graduate studies. Throughout their academic interactions in Germany and Canada, they realized that learning language, in line with one of the perspectives described by Halliday (1985), makes more sense when it is used for real and specific purposes. In fact, Bertha was the only one who used a song as an alternative strategy to motivate the participation of the students.

Sebastian learned English in language institutes and with self-access resources in Colombia before going to England. There, he took a six-month language course in order to prepare himself to use the argumentative discourse that the university demanded in his doctoral program. He stated that in England professors presented the content of their classes, and at the end of each session, they handed out exercises in order to promote autonomous learning. That is why in the CB course in English, he focused on argumentation and gave his students some techniques to write academic papers in English –as he usually does with his courses in Spanish. This *strategy training* (Stoller, 2002) that the professor used to prepare his students in the language of argumentation is evidence of the need students have to manage a specific repertoire of knowledge and activities in order to merit membership to this academic '*club*' (Smith, 1988).

For Lucia, the experience of sink or swim in England revealed that language learning involves both socio-affective and cognitive dimensions. Being the only Latin-American girl in a boarding school, she became a curiosity among peers, and a student who required individual teacher support due to the communications difficulties she had. Her schooling in Colombia allowed her to overcome these linguistic demands through the cognitive strategies she had developed there. Cummins (1996) explains this process, arguing that what people learn in one language transfers into a new language because concepts build the Common Underlying Proficiency (CUP) that allows users of the language to access these concepts as needed in order to be able to express themselves in oral or written form.

In addition, Lucia's experiences as an undergraduate student in the United States allowed her to understand language learning and learning through language (Halliday, 1985) as overarching goals that deal with many dimensions that transcend the mere knowledge and use of language conventions. For the implementation of the CB course, Lucia put into practice some strategies of Problem-based learning (PBL) with the support of her dean who is an advocate of this methodology; however, this is an isolated effort that students struggle to accept.

Linda learned English in Colombia through self-access materials such as textbooks and tapes, focusing her attention on learning about the language (Halliday, 1985). This experience provided the necessary knowledge to pursue her

graduate studies in the United States where she consciously decided to become acquainted with only native speakers in order to maintain and improve her proficiency in the foreign language. In the CB course, she devoted part of her lessons to providing *feedback on language* (Stoller, 2002) to tackle the difficulties she identified as students read or wrote texts. To deal with the approximations (Cambourne, 1988) students made at using the language, she responded by focusing on vocabulary lists and on practicing pronunciation using the round robin strategy.

b. Educational experience

None of these professors has any formal training to teach; nevertheless, they have attended the courses on diverse areas of pedagogy offered every year by the university they work for. They consider these as options which enhance their teaching strategies under the principle of freedom of teaching allowed by the university. However, they consider that these courses often do not fulfill their expectations or might only lead to personal reflection on their classes.

Through the implementation of these CB courses the science professors voiced their concern about their coming to the profession only because of their know-how, since professional development in pedagogy or teaching strategies have been scarce for them. They confirmed that they have derived their principles as teachers from their experiences as learners, and their experience as practitioners in their field.

Academic demands

a. Colleagues and administrators

The language faculty researchers also confirmed that working collaboratively among teachers is hindered most of the time by their busy timetables, the different calendars at the university –eight in total– or the lack of a clear definition of common and complementary goals among schools of different areas of knowledge.

b. Changes in teaching situation

"*In undergraduate programs, students are lectured at, in the graduate levels, the work is more autonomous*"[2] (Bertha). This quote summarizes a repetitive pattern most of the science professors identified for graduate and undergraduate levels that directed them to adjust to those two teaching circumstances. They described the role of the undergraduate students as passive because the number of students per group did not allow one to one interaction. On the contrary, in graduate programs groups are smaller and students are considered colleagues with an active role in class interactions, and are very committed to the acquisition of their own knowledge and learning.

c. Materials

The way the science professors perceived their students in undergraduate and graduate programs established a pattern for selecting the materials they used with these distinct groups. This situation applied both for their regular courses taught in

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2 Testimonies were originally stated in Spanish. For the purposes of this article, they were translated into English.

Spanish and for their CB courses in English. For undergraduate courses, the science professors tend to take articles to class that concern the topics under exploration. Sometimes, the articles in English are suggested as part of the references in order to prepare students for academic challenges in the future. For graduate programs, articles and research studies in English are a must, and the expected responses to those readings should exceed a mere regurgitation of information from the text and go beyond drawing conclusions that could be derived from the context.

Gains

The science professors agreed that this study offered an opportunity to challenge their practices and to incorporate strategies that would enhance their performance as professors, learners and users of the foreign language.

As professors

As mentioned above, most science professors merged the methodologies they used for undergraduate and graduate courses, although some of them said the courses were more focused on graduates. As a consequence, they assigned more responsibility to students than they usually did in the courses taught in Spanish, shifting from a teacher centered classroom to a more student centered one. Landis et al. (1998) found that in order to help students achieve an authentic learning experience, there must be a change in the traditional roles of students and instructors. In this regard, Rodolfo affirmed, "*Later when I met separately with the students, we realized that*

we had to do other kinds of things so that they could participate more, so three of the subsequent classes were only presentations". These presentations were culminating synthesis activities (Stoller, 2002) which permitted students to review how the language they gained through the course allowed them to explain the knowledge they already had or the knowledge that was clarified through the course.

The language faculty researchers found that some of the strategies the science professors implemented during this experience corresponded to those delineated by Stoller (2002). Regarding the extended input, meaningful output, and feedback on language and grasp of content, the science professors increased their confidence in modeling language use for the specific field of knowledge as they planned their lessons and read the texts they took to class. The output the science professors demanded from students changed as the course progressed in order to adapt to students´ real needs related to language and content for presentations and class discussions.

The science professors said that they incorporated new teaching strategies not only in the course they taught in English but also in the regular courses they taught in Spanish. Strategies that persisted through this implementation included the use of the board for writing key concepts, the implementation of visual support strategies (Stoller 2002), and the use of the LCD projector to illustrate new ideas. Camilo acknowledged having improved the content of the classes, and Sara said she had included the use of *the three columns-*KWHL-Chart- (Ogle, 1986) as a meaningful

strategy to improve students´ understanding of ideas.

The science professors recognized that they incorporated wait-time strategies (Johnson, 1996). For instance, Sara stated, *"then, I remembered something you told us: When you ask a question, do not answer it by yourselves, give them (the students) time".* Issues explored during the mentoring sessions, such as time management, turn assignment, questioning and group work were even implemented in their regular courses in Spanish. Additionally, some science professors also admitted to having improved the design of the materials they use in their classes. Camilo said, *"Part of the learning material that I presented in English helped me think over that I could present that same material for my classes in Spanish".*

For all the science professors, lesson planning was a big challenge. Bertha and Marcela practiced in front of a mirror to check their pronunciation and refine the expression of their ideas to students in class. This exercise many times doubled the time they spent preparing for their classes in Spanish. Microbiology professors found peer observation to be a useful tool in identifying specific elements that could contribute to each other's class planning and development.

As users of the foreign language

All science professors understood foreign language learning as a life-long process. That is why some of them expressed their need for more feedback on the conventional use of language so that their communicative competence (Bachman & Palmer, 1996) could become more effective and efficient. Linda said she

would like to continue with the experience of teaching these courses in English because *"it keeps oneself alive, it makes one think constantly, be speaking and listening constantly"*. For the science professors, the main area of development in the foreign language was in terms of vocabulary in their specific areas. For example, Bertha said, *"I learnt loads of vocabulary because I had never studied such an amount of vocabulary on Physiology in English"*. More specifically, Camilo said he had improved his pronunciation, and asserted, *"In my case, I consider it improved (the language) because I also did a big effort for the pronunciation, to pronounce appropriately"*. In terms of BICS (Basic interpersonal conversational skills, Cummins, 2000), content-faculty members recognized the classes as meaningful opportunities to practice the language, to maintain their fluency and to gain self confidence. Lucia affirmed, *"It helped in the sense that it is useful to practice, to keep the level of fluency in the language"*. In the same way, Rodolfo declared, *"Regarding English, what you really gain is confidence […]. For example the first class I never thought I was able to speak two hours in a row but the pressure leads you to that. Then, when I left class, I left with my ego high above"*. He also admitted to having improved his BICS through the learning of colloquial language in the interactions with Lucia and Linda who studied abroad. Even though some professors thought they were not prepared enough to correct students' mistakes, they became more aware of language usage. Bertha mentioned her improvement in language awareness, to wit: *"After I listen to myself, I identify the mistakes I make"*.

According to the data analyzed, there is not a clash between the way the science professors perceive themselves and their teaching practices, but over their level of awareness and reflection on their own practice. As a consequence, the language faculty researchers give some suggestions on how mentoring programs should be guided, so that they would enhance subject area professors' abilities and confidence to implement this methodology. This way, they contribute to the development of the linguistic and cognitive skills of the students and to their understanding of the academic content as well as to their own professional development.

Proposal for Mentoring Sessions

The following proposal takes into account the conclusions the science professors and the language faculty researchers derived from this study. These professors would have liked to have seen more demonstrations of strategies they could have used before starting the course.

Camilo summarizes this query as he states, *"I think that perhaps what one expected unconsciously was to have had some classes previously with you about how we should teach, right? I think it would be very interesting, maybe that you start first being our teachers to try to set those key points about pedagogy […]"*. The science professors are then aware of the fact that demonstrations, as explained by Cambourne (1988) and presented in the literature review, are one of the most important conditions to learning. In the case of the mentoring program, these demonstrations should include both

language content and methodology content. In the same vein, Lucia expressed the need to start working with the course material and *"provide with it the teaching examples that can be given. Of course there are some introductory talks that are necessary but I think that they could have been less and work more on planning the material for the course"*.

The stages suggested by the language faculty researchers for the mentoring program address the professional support subject area professors require to balance language and content, to establish the goals for those two aspects, and to review or incorporate teaching and learning strategies in their teaching practices. Subject area professors need to take into account that within the framework of the adjunct model (Snow, 1993), half the time they will be in charge of the content and the other half of the time assigned for the course will be devoted to language support in separate lessons with language faculty.

Introductory Stage

Through individual quickwrites, small group sharing, large group discussions or alternative activities, language faculty will support subject area professors in becoming aware of the varied influences they have had throughout their academic life as students and as teachers, as well as how these factors have defined their teaching identity. The events implemented by facilitators during this first stage need to encourage reflection on the strategies they favor for the promotion of learning. They would also be encouraged to identify their pedagogical position through a historical account of

pedagogical approaches in education and those specific to foreign language teaching.

Demonstrations

Once subject area professors have an initial picture of their own history as teachers and learners, they will agree that language faculty need to model strategies for language learning. Subject area professors will be part of these demonstrations with three different roles: as participants, as participant observers, and as facilitators. In their role as participants, subject area professors would take part in events that allow the exploration of subject matter of interest to them. The events will create real class conditions and they will need to participate and accomplish real tasks related to language use and acquisition of content. In these sessions, other sources of information and materials that may be non-traditional for their field such as pictures, games, or literature would be integrated in order to offer subject area professors alternatives they might incorporate in their practice. Being participant-observers will allow them to play the double role of insiders and outsiders in a teaching process that will require new standpoints and risk-taking. They will take turns participating as learners and as critical observers of all the strategies facilitators use to balance both language and content. They will also be required to reflect upon the way subject area professors react in their role of students. As they describe the process of both groups of participants, they will consolidate a repertoire of strategies that they will use for the following step where they will facilitate the lessons. In a team-

teaching format, subject area professors will plan lessons as a whole group. They will then go on to use these planned activities on their own with real classes. Language faculty will guide them in defining an agenda with events that allow students to tap into their background knowledge and be ready for the topics they will explore, followed by other activities that introduce the topic, and finally those that allow students to practice what they learned for both language and content. In the course of this activity, a reflection cycle will start again to define the similarities and differences with their current teaching practice. This reflection should analyze teaching strategies such as wait time, defining types of questions, classroom management, the use of visual and audio resources, and turn assignment. At the same time, it is necessary to review the adjustments required for their double role as content and language professors. Seminars are a suitable forum for this purpose. Similarly, there is a need to address the terminology of the field, the role of the mother tongue, the selection of material, and follow-up strategies for assessment.

Defining Content and Linguistic Goals

For the definition of content goals, subject area professors need to organize the topics in a progression that allows students and themselves to move from familiar to more unfamiliar knowledge. Existing CB programs have to be adapted, or new ones created, that are paced in a way that will allow the insertion of relevant connections to the types of discourses and topics defined for the language class.

Feedback Sessions

Throughout the development of the content course in English, language faculty will arrange periodical meetings with subject area professors in order to give them the opportunity to share their experiences. It is hoped that these sessions would include decision making about adjustments to the strategies implemented, discussions of materials used, as well as reflection on the performance of the students and logistical issues.

Conclusion

Through this project, the language faculty researchers realized that when implementing CB courses, non language faculty require clear demonstrations of the strategies they need to balance language and content. They also require effective support at the moment of defining content and linguistic goals for their courses, and constant feedback that together promote reflection on the influences the science professors have had on their language learning and teaching during their academic years.

This process of professional development needs explicitly to validate the experiences of these professors as learners, language users, and their power to make decisions about how to enrich their teaching practices. In so doing, subject area professors will define the guidelines for the CB course in such a way as to help students gain confidence in using the discourse of their field in a foreign language.

Finally, the foreign language policies at the university need strongly to support the

actions taken by deans or directors of the different schools when planning this type of courses, in order to be consistent with the expectations of the university policy makers, whose priority is to support both students and professors to achieve an accomplished professional life.

References

Altrichter, H., Posch, P., & Somekh, B. (1993). *Professors investigate their work: An introduction to the methods of action research*. London: Routledge.

Arellano-Osuna, A. (1992). *El lenguaje integral: una alternativa para la educación*. Mérida: Editorial Venezolana.

Arnal, J. et al (1994). *Investigación educativa: fundamentos y metodologías*. Barcelona: Labor.

Bachman, Lyle F. & Palmer, A. (1996). *Language testing in practice-designing and developing useful tests*. Oxford: Oxford University Press.

Berry, R. (1999). Collecting data by in-depth interviewing. Paper presented at the British Educational Research Association Annual Conference, University of Sussex at Brighton, September 2-5, 1999. Retrieved on May 15, 2005 from Education-line Web site: http://www.leeds.ac.uk/educol/documents/

Brinton, D.M., Snow, M.A., & Wesche, M.B. (1989). *Content-based second language instruction*. New York: Harper & Row.

Burns, A. (1999). *Collaborative action research for English language professors*. Cambridge: Cambridge University Press.

Cambourne, B. (1988). *The whole story: Natural learning and the acquisition of literacy in the classroom*. Auckland: Ashton Scholastic.

Clavijo, A. (2000). *Formación de maestros: historia y vida*. Bogotá: Plaza & Janés.

Cummins, J. (1996). *Negotiating identities: Education for empowerment in a diverse society*. Ontario: California Association for Bilingual Education.

Cummins, J. (2000). *Language, power and pedagogy. Bilingual Children in the Crossfire*. Clevedon, Buffalo, Toronto, Sydney: Multilingual Matters Ltd.

Debus, M. (1988). *Manual para la excelencia en la investigación mediante grupos focales*. Washington D.C.: Academy for Educational Development.

Dendinger, M. (2000). *How to organize a focus group. Meetings and conventions*. Retrieved on May 15, 2005 from BNET Web site: http://www.findarticles.com

Dewey, J. (1938). *Experience in education*. New York: Collier.

Diaz, C. (2002). *Teacher training in Colombia: Reflective and experiential practices in EFL*. Unpublished Master Thesis: Fresno Pacific University.

Freeman, D. (1998). *Doing teacher research: From inquiry to understanding*. Newbury House: Heinle and Heinle.

Freeman, Y. & Freeman, D. (1994). *Between worlds: Access to second language acquisition*. Portsmouth: Heinemann.

Freeman, Y. & Freeman, D. (1998). *ESL/EFL teaching: Principles for success*. Portsmouth: Heinemann.

Genesee, F. (1994). Integrating language and content: Lessons from immersion. Educational Practice Report 11. National Center for Research on Cultural Diversity and Second Language Learning. Retrieved on July 5, 2004 from http://www.ncela.gwu.edu/pubs/ncrcdsll/epr11.htm

González, A., Montoya, C. & Sierra, N. (2002). What do EFL Teachers seek in Professional Development Programs? Voices from professors. *Íkala, revista de lenguaje y cultura*, *7*, 29-50.

Goodman, K. (1986). *What's whole in whole language?* Portsmouth: Heinemann.

Goodman, K. (1996). *On reading*. Portsmouth: Heinemann.

Goodman, Y. & Marek, A. (1996). *Revaluing readers and reading: Retrospective miscue analysis*. Katonah: Richard C. Owen.

Halliday, M. (1985). *Three aspects of children's language development: Learn language, learn about language, learn through language*. Unpublished manuscript, Department of Linguistics, Sidney.

Johnson, K. (1996). *Understanding communication in second language classrooms*. New York: Cambridge University Press.

Kvale, S. (1996). *Interviews: An introduction to qualitative research interviewing*. London: Sage Publications.

Landis, et al. (1998). The new traditions consortium: shifting from a faculty-centered paradigm to a student-centered paradigm. *Journal of Chemical Education, 75*, 741-744. Retrieved on January 29, 2006 from JCE Online Web site: http://jchemed.chem.wisc.edu/HS/Journal/Issues/1998/Jun/clicSubscriber/V75N06/p741.pdf

Met, M. (1999). *Content-based instruction: Defining terms, making decisions*. NFLC Reports. Washington, DC: The National Foreign Language Center. Retrieved on December 1, 2006 from http://www.carla.umn.edu/cobaltt/modules/principles/decisions.html

Ogle, D. (1986). KWHL: A teaching model that develops active reading of expository texts. *The Reading Teacher, 39*, 564-570.

Pring, R. (2000). *Philosophy of educational research*. New York: Continuum.

Rosenblatt, L. (1978). The reader, the text, the poem: Transactional theory of the literacy work. Carbondale, Southern Illinois, United States: University Press.

Rosenkjar, P. (2005). Adjunct courses in the Great Books: The key that unlocked Locke for Japanese EFL undergraduates and opened the door to academia for EFL. In J. Crandall & D. Kaufman (Eds.). *Content-based instruction in higher education settings* (pp. 13-25). Alexandria, VA: Professors of English to Speakers of Other Languages, Inc.

Salmon, K. (1998). Ciclos temáticos: una alternativa para el desarrollo de la lectoescritura bilingüe. *Lectura y Vida, 19*, 26-34.

Smith, F. (1998). *The book of learning and forgetting*. New York: Professors College Press.

Smith, F. (1988). *Joining the literacy club: Further essays into education*. Portsmouth, NH: Heinemann.

Smith, F. (1981). Demonstrations, engagement, and sensitivity: A revised approach to language learning. *Language Arts,* 103-112.

Snow, M. (1993). Teaching English through content. In M. Celce-Murcia. *Teaching English as a Second or Foreign Language* (pp. 315-327). Boston: Heinle and Heinle.

Stewart, T.; Sagliano, M., & Sagliano, J. (2005). Merging expertise: Developing partnerships between language and content specialist. In J. Crandall & D. Kaufman (Eds.), *Content-based instruction in higher education settings* (pp. 29-44). Alexandria, VA: Professors of English to Speakers of Other Languages, Inc.

Stoller, F. (2002). *Content based instruction: A shell for language teaching or a framework for strategic language and content learning?* Keynote presented at the annual meeting of Professors of English to Speakers of Other Languages (TESOL) 2002, Salt Lake City, UT. Retrieved on December 1, 2006 from CARLA Web site: http://www.carla.umn.edu/cobaltt/modules/strategies/stoller.html

Tellis, W. (1997). Introduction to case study. *The Qualitative Report, 3*(2). Retrieved on May 15, 2005 from NOVA Web site: http://www.nova.edu/ssss/QR/QR3-2/tellis1.htm

Vygotsky, L. (1934). *Thought and language*. Cambridge: MIT Press.

Vygotsky, L. (1978). *Mind in society: The development of higher psychological processes*. Cambridge: Harvard University Press.

Whitmore, K. & Goodman, Y. (1996). *Whole language voices in teacher education*. York: Stenhouse Publishers.

Woodward, T. (1997). *Models and metaphors in language teacher training*. Cambridge: Cambridge University Press.

Yin, R. K. (1994). *Case study research: Design and methods*. Thousand Oaks, United States: Sage.

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Appendix 1. Format for Class Observation in the Different Schools

University of Antioquia
School of Languages
Content Based Teaching – Thematic Research

Teacher: _____ No of Students: _____

Course: _____ School: _____

Date: _____ Classroom: _____ Time: _____

Observer: _____

Time	Activities, attitudes, interactions		Comments and questions (observer)
	Teacher	Students	

Classroom	Agenda	Resources

Appendix 2. Questions Asked in the Focus Groups and in the In-Depth Interviews with the Professors

Focus group

1. What would you do differently if you could teach this course again?
2. Did you notice any difference between the way you teach your regular courses and the ones of this project?
3. Within the framework of collaborative work with the School of Languages, do you consider that there is something to be improved in the School of Languages?
4. Did you experience any change or improvement regarding English? Regarding the contents of the course?
5. How did you perceive the pupils of this course to be positive regarding their learning of the contents?

The following is an example of the questions asked in an in-depth interview:

1. What kind of didactic resources did you introduce specifically for the English classes?
2. How would you define yourself as a language user in terms of oral, written, formal and informal situations?
3. How do you value the mentoring sessions offered by the researchers and what would you suggest for future mentoring processes of this kind?
4. What is the students' role in your classes?
5. Which interaction dynamic do you propose for your classes?
6. Which methodology do you use for your Spanish and English classes?
7. Do you use the same methodology for your undergraduate and graduate courses?
8. Which way were your teaching practices in Spanish enriched after the experience of teaching this content course?
9. How did you learn English?
10. How was your learning process in your professional field as a teacher?

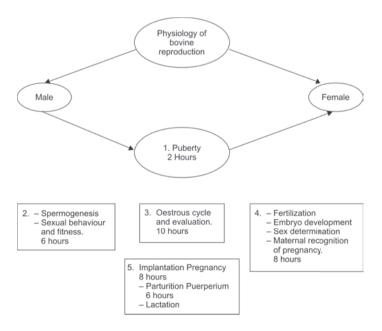# Appendix 3: Linguistic and Content Goals

Grupo de investigación: Enseñanza-aprendizaje en lenguas extranjeras
Content-based language teaching project
Ciencias Agrarias

Linguistic Goals

- Throughout the course, students will be exposed to and actively participate in language and content exploratory events that will encourage them to use oral and written language for describing processes related to the physiology of reproduction in bovines.

- Throughout the course students will use oral and written language to give and follow instructions related to the procedures needed for the practicum of reproduction in bovines.

- Throughout the course students will read article reviews that will allow them to understand and use strategies for creating their own reviews.

- Throughout the semester students will read reports regarding procedures related to reproduction and create a report in the company of the teacher in order to present a final one individually in which they state goals, methodology and conclusions.

Content Goals

- Throughout the semester students will become aware of the physiology of reproduction of bovines in order to replicate and differentiate procedures with other species.