

Sustainability awareness-raising in a foreign language course

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Higher education institutions (HEIs) are under increasing pressure to become more efficient, but at the same time, more innovative in offering their courses. HEIs in life sciences in particular are the ones that should provide the opportunities for their students to acquire the values, competencies, knowledge and skills to promote behaviour in support of sustainable development (SD). Education for SD requires an interdisciplinary and holistic approach to teaching and learning. This paper presents how SD topics can be integrated across all relevant subjects of the existing curricula through delivering foreign language courses by adopting a problem-based learning (PBL) approach. Through collaboration of a language teacher (LT) with a subject area specialist (SAS), the approach facilitates teaching foreign languages across the curriculum. This paper throws light upon this joint teaching venture. The reasons for switching from traditional English for Specific Purposes (ESP) teaching to PBL approach are given, the steps of the PBL process are sketched and roles of the SAS matched against the tasks related to the students' work in a PBL situation are dealt with. Finally, strengths as well as weaknesses of this three-party collaboration are pointed out and possibilities for further developments suggested.

Key words: sustainability, agricultural education, foreign language course, problem-based learning

A RATIONALE FOR THE INTRODUCTION OF PBL APPROACH

Modern times call for the necessity of switching from teacher-directed to self-directed, independent life-long learning. Only an independent learner knows or can work out what and how to learn efficiently in a given situation, which makes him/her a free individual, a creative force in society and self-starting entrepreneur. According to Nunnan (1996) this is why contemporary ELT pedagogy promotes a change in the direction of language teaching from being predominantly teacher-centred to more student-centred. Language learning, as Thomson (1996) puts it, is a life-long endeavour and there are always areas that can be improved in all the four skills.

For most students language is acquired most effectively when it is used as a vehicle for doing something else and not when it is studied in a direct or explicit way. It is, as Lee (1998) suggests, therefore important to help students become aware of the value of independent learning outside the classroom and support their greater autonomy in language learning, so that they acquire the habit of learning continuously, and maintain it after they have completed their formal studies.

At Slovenian HEIs, students use English and other foreign languages as a tool in their professional studies. In their real-life situations they will be required to think creatively and critically, to communicate effectively with all sections of the community, to work well in multi-disciplinary teams in various roles, and to define and solve complex problems. Employers are concerned that students going through universities are not particularly well equipped to deal with the kind of problems they encounter in real life.

They are looking for graduates who are good communicators (also when switching to a foreign language), good team-workers, and adaptable lifelong learners.

This is why in the academic year 2000/2001 a novel approach, i.e., problem-based learning (PBL) was introduced as a pilot project to English for Specific purposes (ESP) courses at eight higher education institutions in Slovenia with the Faculty of Agriculture of Maribor University being one of them. This Slovenian project was partially funded by the British Council and was meant to be a dissemination of a European Leonardo TENTEC project (www.pedc.se/tentec).

As a member of the Language Case Studies (LCaS) EU project team I deepened my knowledge on how to design good cases (problems) that can serve as a driving force for the professional language learning process. This EU project resulted in a handbook available online:

(http://www.ecml.at/mtp2/publications/2009_12_01_D4_LCaS_05_08_2008.pdf).

At our Faculty of Agriculture and Life Sciences thus almost ten years ago a shift was made from the text-based approach to a new way of teaching English across curriculum with the aim to combine language and content study and facilitate independent learning. With the PBL approach we intend to better meet our students' needs for acquiring other skills and knowledge not taught in an ESP classroom, which is considered to be added value to teachers' and students' endeavours.

The traditional approach to teaching and learning English for Special Purposes (ESP) is text-based, language teacher (LT) directed, it involves individual learning and at the end of the learning process students are assessed by the LT only. PBL approach, on the other hand, is based on language case studies, it is student-directed, it requires independent out-of-class research and self-study challenging students to "learn to learn". Through establishing collaboration

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between LT and SAS, it facilitates teaching English across the curriculum and also integrating sustainability topics across all relevant subjects. The overall aim of this approach is not only to further develop our students' traditional four language skills, but also transferable skills, such as team collaboration, problem solving, info-search, time management, higher order thinking skills and creative and critical thinking. By inviting students to take 'a bumpy road' through seeking solutions to real world problems, we are trying to make a switch to a better quality of ESP teaching and learning. This required also exploring the ways to a better quality of assessment and switching from traditional to innovative assessment techniques. Brown et al. (1994) argue that there are many good reasons why students should be involved in the assessment of their own and each other's work and why assessment power should be redistributed. They claim that it encourages a sense of ownership of the process, so students are more committed to the outcomes, it develops a whole range of transferable skills and facilitates lifelong learning, it helps students become more autonomous learners, better able to recognise the strengths and weaknesses of their own work, and it encourages deep rather than surface learning.

The following assessment tools have been designed to be used in a language class when using language case studies as a driving force for the learning process: group presentation assessment schedule (Table 1), and written report assessment schedule (Table 2) to be used by LT and SAS; for students we designed presentation self-check (Table 3) and presentation peer check (Table 4) grids for assessing group presentations, and the end of PBL process evaluation schedule (Table 5) enabling the students to reflect upon skills development and to provide feedback to LT and SAS.

STUDENTS' TASKS AND SAS'S ROLES

Students' Tasks

In the first meeting students are faced with the language case studies prepared by LT in collaboration with SAS. They decide which work-related problems they are interested in exploring and they form groups according to their interests. Students explore the problem, identify their current knowledge and the lack of knowledge in certain areas. With the help from LT and SAS they structure ideas, identify learning needs, formulate the learning aims and distribute assignments among group members.

During independent learning and out-of-class research, the group members gather information on their topic from various sources and are helped by LT with advice on possible linguistic problems; the SAS acts as a tutor for the content part of the research.

In the last step teams integrate their ideas and present a possible solution of the problem in their group written reports and oral presentations, which are their two end products of the learning process.

In the LCaS project we found that a useful thinking framework for our students on their PBL journey could be the Research Cycle (McKenzie 1993) which includes six stages: questioning, planning, gathering information,

sorting & sifting information, synthesizing & evaluating and reporting. McKenzie (1993)(*ibid.*) claims that questions allow us to make sense of the world. They are the most powerful tools we have for making decisions and solving problems, for inventing, changing and improving our lives as well as the lives of others. This is why *questioning* is the first stage of any research. He advises using three prime questions: WHY? (Why do we have problems with?); HOW? (How could we change things for better?), and WHICH? (Given the choices before us, which is most likely to do the most good? Which plan is the best? Which solution will work best?).

SAS' Roles

One of the main characteristics of the PBL process in an ESP course is that it integrates students' professional knowledge with the knowledge of English. The LT alone cannot cope with the content because the complexity of the problem may outreach the competencies of LT. For this reason collaboration with SAS is essential and the role of SAS in the process undisputed. At the initial stage of the process, SAS acts as an advisor to the content and a case co-designer. This first step is probably most crucial. If a language case study is ill-structured and has not been designed in such a way as to engage students' curiosity, the learning process may fail. The SAS joins LT in the ESL classroom during the 1st meeting of teams and plays the role of a primary knower of the content and purveyor of any additional information students may need. He/she may help them make the problem clear and also identify their current knowledge. In the *planning* stage the SAS and LT help students structure the ideas and identify learning needs. Students formulate the learning aims and allocate assignments. The *gathering* stage is performed out-of class. Students search individually for extra knowledge on the learning aims formulated during the 1st team meeting. By exploring various sources of information, everyone's knowledge on the topic should deepen; it is the responsibility of everyone to obtain knowledge and new information on the topic. In this stage the role of the SAS turns from direct lecturer to students into their facilitator, tutor, coach and provider of literature, which is probably the most important added value of PBL.

During the 2nd team meeting, students go through *sorting & sifting* of information. Everybody participates in discussion, analysis, inquiring and evaluating his/her knowledge. Trying to build the meaning out of scattered pieces which will help them solve the jigsaw puzzle, students ask themselves questions, such as: Is this data worth keeping? Will this info shed light on our question? Is this information reliable? How can we summarize the best ideas? Are there any especially good quotations to paste into our document? Do we have enough information to defend our case? A positive answer leads to the report writing stage, while a negative answer leads to more out-of class research and gathering information. By the 3rd team meeting students complete individual assignments which will form the main part of their written report. By following the instructions of LT for writing the Introduction and Conclusion, they provide at least tentative answers to the original essential questions which provoked the research project in the first place. When trying to answer their key research question, they are not expected

to find a single, right solution, but they are challenged to formulate suggestions and recommendations for solving the problem that result from their critical and creative thinking.

The draft reports are handed in to be proofread by LT (focusing on language, structure) and SAS (content). With the help of their comments students write their final versions and prepare their group presentations by following the instructions of LT on the structure, visual aids, language and delivery. The most important part is giving group oral presentations of their findings to their colleagues, LT and SAS. The SAS's role in this stage is that of a co-assessor of students' endeavours. Also students participate in the designed assessment scheme by filling in self- and peer assessment checklists for formative and summative purposes.

STRENGTHS AND WEAKNESSES OF THIS JOINT TEACHING VENTURE

Foreign language courses are tailor-made to the requirements of different study programmes. The most rewarding for language case studies are the topics that encourage students to think of possible ways of handling agricultural sustainability issues, such as energy crisis, climate change, biodiversity loss, food crisis and food self-sufficiency, genetic modification, animal rights, etc. By making them country-specific, they are even more attractive for students to explore. In this joint teaching venture, the SAS can plan the subject matter together with the students, which can be more motivating than their direct lectures. They can get an insight into their own teaching techniques. Such collaboration also facilitates a useful feedback on how students use knowledge acquired at their classes for solving problems. The SAS also has a good opportunity to get an insight into what students can do in English, which usually results in an increased trust in their students' abilities. But probably the most important is the opportunity offered to the SAS for the transition from a teacher as information giver to a teacher as a coach, who usually finds students' excitement about PBL to be rewarding and important.

The LT may get a better insight into the subject matter itself. This brings about greater confidence and improved contacts with the other two parties involved and also a greater certainty that he/she is teaching the language and developing the skills the students will need in their real lives. If a sense of ownership of the process is encouraged by the LT, students are committed to the outcomes, their motivation increased and deep rather than surface learning encouraged. Also the importance of foreign languages within the curriculum may be increased and better appreciated by other subject specialists.

PBL is very 'elastic' and can be integrated easily in the overall ESP syllabus as one strand along with two other strands, i.e. grammar revision of selected structures and professional reading and writing, which is text-based. If foreign students select the ESP course in their ERASMUS exchange study programmes and join Slovenian teams, this gives the teaching and learning process a multicultural dimension and makes it even more interesting and rewarding

for students. This strand of the course is found to be most appreciated not only by Slovenian but also by foreign students. The repertoire of sustainability topics related to agriculture is wide and language case studies can be jointly designed by LT in collaboration with SAS so as to arouse interests of students of various study programmes. This is especially convenient if language courses are organised so that they include students of different fields.

The three parties involved in this teaching and learning process can all gain from their collaboration. PBL helps students to reflect on the purpose of language learning, to reflect on their strengths and weaknesses and to plan the areas they want to improve. It also helps LTs and SASs to become reflexive teachers striving for continuous improvements of their teaching endeavours.

On the other hand, one of the most crucial weaknesses that can hinder the teaching and learning process is that some SASs are used to direct teaching and may tend to determine the content via the problem and thus determine the answers in advance. If they do so, such problems, according to Duch et al. (2001) correspond to the lowest Bloom (1956) cognitive levels of knowledge or comprehension. They are generally confined to the topic(s) addressed in the chapter, and all the information needed to solve the problem is given.

Duch (2001)(*ibid.*) argues that well-designed cases (problems) are one of the keys to success in implementing PBL in undergraduate courses. They should have the following characteristics: they should be interesting, motivating, controversial or arising emotions, and relevant to the professional field. It is important that they are taken from real life, not just artificially produced for teaching purposes. They must be open-ended in terms of offering different solutions. The interests and needs of the students, their pre-existing knowledge from other subjects, and their future careers should be taken into account when designing cases for them. And they should prove useful to students with regard to exams – the success or failure in the PBL process should contribute towards the final grade.

The crucial requirement that good language case studies should meet is that they should challenge students to develop higher-order thinking skills moving them from lower cognitive levels of knowledge and comprehension to the higher Bloom levels of analysis, synthesis and evaluation. These are the skills that are so important for our students to develop in order to be successful in any profession. If they lack these skills, their career potential is limited.

POSSIBILITIES FOR FURTHER DEVELOPMENTS

Modern times and more and more complex problems are challenging educators not to be stuck in the past, but to connect and apply interdisciplinary approaches to educate young people who will be able to reflect on and participate in the process of making our world a better place to live in.

PBL approach could work as stimulation for educational change in tertiary level educational settings. Since the success of this teaching and learning process depends on how

firmly the triangle between the SAS, the LT and the project groups has been formed, it is important to attract as many SASs as possible who are willing to form a collaborative partnership with LTs. When more initiatives are undertaken for the integration of sustainability education in university studies across Europe, this didactic approach, characterized by its cross-curricula dimension, could be spread further afield, perhaps via the Internet or by means of international partnerships. Projects at the Faculty of Agriculture and Life Sciences, University of Maribor, could be linked with projects at other institutions. This, of course, would unite subject specialists at different institutions as well and could lead to designing even more interesting language case studies focusing on sustainability issues.

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Table 1: Group presentation assessment schedule

Name of Speaker:							
Member of Team ... :		Date:					
		Yes, Definitely	Yes, to some extent			No, not really	
A. PREPARATION AND CONTENT							
1.	Choice of topic: Well researched, interesting, informative topic, made relevant to the audience and related to Slovenia	5	4	3	2	1	0
2.	Organisation Clear introduction Clear conclusion	5	4	3	2	1	0
3.	Good use of 'signpost' words	5	4	3	2	1	0
B. PRESENTATION STYLE							
1.	Delivery Good use of eye contact/body language? Voice - audible and varied tone? Good use of notes? (not read)	5	4	3	2	1	0
2.	Use of Overhead Transparencies/Slides OHP/LCD used effectively? OHP/slides well prepared - easy to read?	5	4	3	2	1	0
3.	Visual aid(s) relevant/appropriate and language correct?	5	4	3	2	1	0
C. LANGUAGE							
	Appropriate to audience and topic?	5	4	3	2	1	0
	Grammar accurate?	5	4	3	2	1	0
	Pronunciation clear?	5	4	3	2	1	0
	Qs from the audience effectively dealt with?	5	4	3	2	1	0
Start time:		Sub total:					
Finish time:							
		<u>Timing penalties</u> (one mark per minute deducted if talk under 13 or over 17 mins.)					
		Total Mark: /50					
		Pass: 32/50					

Table 2: Group written report assessment schedule

Name of Speaker:
 Member of Team ... : Date:

	Yes, Definitely	Yes, to some extent	Yes, to some extent	No, not really
A. CONTENT				
Topic: well researched, interesting, informative and related to Slovenia	5	4	3	2
Source materials: (Appropriateness, Integration, Acknowledgement)				1
B. ORGANISATION				
Situation, Focus, Response, Evaluation	5	4	3	2
				1
C. VOCABULARY				
(Range, word choice - glossary)	5	4	3	2
				1
D. LANGUAGE				
Tense, Agreement, Word Order, Active/passive, Articles, Prepositions	5	4	3	2
				1
E. MECHANICS				
Spelling, Punctuation, Capitalisation, Paragraphing	5	4	3	2
				1
F. PRESENTATION				
Title page, Content page, Bibliography	5	4	3	2
				1
 *to be assessed by SAS				
Breakdown of assessment:		% - Subject Specialist		
		% - Language Teacher		
Total mark:		/30		
Pass:		/30		

Lešnik, M., Fakulteta za kmetijstvo, Maribor (2002)

Table 3: Presentation self-check

As a team, fill in this form* to rate your group's presentation. Circle the number that best describes it.

Team: -----

1. Research: Our group researched our subject using books, magazines and other sources of information.

1	2	3	4	5
not at all		a little		a lot

2. Organisation: We organised our research in a logical way and included interesting facts.

1	2	3	4	5
not at all		a little		a lot

3. Preparation: We practised our presentation to work on pronunciation, intonation, fluency, and other aspects.

1	2	3	4	5
not at all		a little		a lot

4. Presentation: We were well prepared and got others involved in a discussion on our topic.

1	2	3	4	5
not at all		a little		a lot

5. We helped others learn new information and vocabulary through our presentation.

1	2	3	4	5
not at all		a little		a lot

6. Overall, we think our presentation was

1	2	3	4	5
poor	below average	average	good	excellent

Total: ____/30

Table 4: Presentation peer check

As a team, fill in this form* to rate other groups' presentations. Circle the number that best describes them.

Name of the group: _____

1. Research: The group researched the subject.

1	2	3	4	5
not at all		a little		a lot

2. Organisation: The group was well organised.

1	2	3	4	5
not at all		a little		a lot

3. Preparation: The group was well prepared.

1	2	3	4	5
not at all		a little		a lot

4. Presentation: The group got us involved in a discussion on the topic.

1	2	3	4	5
not at all		a little		a lot

5. The group helped us learn new information and vocabulary through the presentation.

1	2	3	4	5
not at all		a little		a lot

6. Overall, we think the presentation was

1	2	3	4	5
poor	below average	average	good	excellent

Total: ____/30

* The above two forms are based on 'Presentation Self-Check' by David Progoch, writer and editor of ESL materials and tests. Quoted from *New Ways of Classroom Assessment* (Brown, 1998, ed.) - adapted by Lešnik, M., Fakulteta za kmetijstvo, Maribor (2002).

Table 5: The end of PBL process evaluation

	Strongly agree	Agree	No opinion	Disagree	Strongly disagree
PBL process increased my ability to solve real-life problems					
PBL process encouraged me to take an active role in my studying					
PBL increased my information-locating skills					
PBL increased my ability to work effectively in a team					
PBL increased my discussion skills					
I could combine professional knowledge with English					
PBL increased my ability to give effective presentation					
PBL increased my writing skills					

Lešnik M., Fakulteta za kmetijstvo, Maribor (2002)

