

# Article

## **e-PBL: your tablet for effective Medical Spanish learning**

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### **Abstract**

This paper aims to describe some issues surrounding the development of a VLE for the blended teaching of medical Spanish via a problem-based learning (PBL) methodology which has its foundations on constructivism, self-directed learning and collaboration. Firstly, the main purpose, features and stages of this instructional method are discussed together with some recommendations for its implementation in the specialist language class. Then some examples of useful e-tools and resources for blended PBL and/or e-PBL are presented. Finally, the components of the medical Spanish VLE are described in a flexible framework that integrates language and content based knowledge with a view to support and complement face-to-face tuition and provide multiple opportunities for interactive practice and feedback in preparation for effective target language communication in the students' professional future.

**Keywords:** Problem-based learning, blended-learning, specialist language.

### **1. PBL and specialist language learning**

One of the main challenges when learning specialist languages such as Medical Spanish is to prepare the students to solve authentic real-world problems that currently occur in diverse communicative contexts. For this purpose mirroring real-world case scenarios when designing the language curricula becomes paramount. One of the most effective ways of doing so is adopting the problem-based learning (PBL) instructional method, which has its foundations on constructivism (1). PBL was suggested by Barrows (1986) as an alternative to prepare medical students for real-world problems. Rather than attending traditional lectures teaching medicine out of context the students attended tutorials where they practised on solving authentic carefully constructed clinical problems based on conceptualised real life cases. This way students have to think and act like they would in the real world.

According to Barrows and Tamblyn (1980) some of the main features of the PBL model are the following:

- Complex, real-world situations that have no 'right' answer are the organizing focus for learning
- Students work in teams to confront the problem, to identify learning gaps and to develop viable solutions
- Students gain new information through self-directed learning
- Tutors act as facilitators
- Problems lead to the development of clinical problem-solving capabilities

Medical schools all over the world have made use of PBL to address many of the perceived problems in traditional medical curricula. For example, the Manchester undergraduate medical programme was the first in the UK to adopt PBL as its main educational method. Students are presented with clinical scenarios to investigate, explore and propose responses to collaboratively. Some of the advantages of this method over more traditional approaches include its greater relevance to the practice of medicine, its ability to promote retention and application of knowledge, and its encouragement of self-directed lifelong learning. Among the skills and attitudes involved are teamwork, critical evaluation of literature, self-directed learning and use of resources, and presentation skills.

Some of the disadvantages of PBL are that it is time consuming and that it may be difficult to implement when class sizes are large or if there is a lack of enthusiasm for the idea.

When thinking on implementing PBL in the specialist language class it is important to present the students with relevant carefully selected scenarios that are meaningful to them and allow them to combine subject and language practice, to ensure the tutor or facilitator serves as guidance throughout the entire process and provides many opportunities for feedback, and to develop skills for effective work production that will be useful to students in their professional future.

One of the key stages when thinking about implementing the PBL methodology on a specialist language course curriculum would be to find an appropriate way to match language and subject-specific contents (e.g. clinical cases that are relevant to students like the ones shown in figure 1) in such a way that it is flexible (i.e. not restricting itself to discussing PBL scenarios exclusively but using them as input to introduce other grammatical, cultural or sociolinguistic issues) and meaningful to students (i.e. appropriate to their stage in the medical curriculum and their level of understanding). Another crucial factor is that each PBL case is designed with specific and clear learning objectives in mind, for example if a clinical case is about asthma, this may stimulate students to learn about the structure and function of the respiratory system. It is equally important that the learning objectives are of appropriate scope to be addressed in the time available prior to class and in class. The language tutor may decide to focus on a small number of learning objectives (clinical and linguistic) for each session, design specific cues to stimulate discussion in the TL, and encourage students to seek definitions and explanations for some of the key terms.

<b>SOME PBL CASES PER YEAR</b>		
YEAR 1	Life cycle, Cardio respiratory fitness	Normal pregnancy and delivery, disorders in pregnancy and delivery, cystic fibrosis, short stature, HIV, osteoporosis, asthma
YEAR 2	Mind and movement (I), Nutrition and metabolism	Back pain, squint, visual impairment, degenerative CNS disease, depression
YEAR 3	Nutrition, Metabolism and excretion, Heart, lungs and blood	Peptic ulcer, dysphagia, carcinoma of the colon/rectum, inflammatory bowel disease, chronic liver disease, thyroid disorders, adrenal excess, diabetes, urinary incontinence

YEAR 4	Families and children, Mind and movement (II)	Sexually transmitted diseases, carcinoma of the breast, meningitis, testicular swelling, gastroenteritis, cerebral palsy, carcinoma of the uterus, suicide and self-harm
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Figure 1. Some clinical PBL case topics per year, MBChB Medicine, University of Manchester.

A typical PBL session usually involves a small number of students and is guided by a facilitator who encourages self-directed learning without contributing directly to the solution of the problem. He/she makes sure students stay on track and find the resources they need. The role of the students is to identify their own learning objectives and collaborate to gather resources and pose questions that help them develop a solution to the problem.

In terms of organising the sequencing of each PBL session into the course we take into consideration the various PBL process stages. Savin-Baden (2007:22) presents the Maastrich approach to PBL as a model process that is tightly structured and includes the following stages: (1) clarification and agreement of working definitions, unclear terms and concepts, (2) definition of the problem and agreement on which phenomena require explanation, (3) analysis of the problem, (4) arrangement of explanations into a tentative solution, (5) generation and prioritisation of learning objectives, (6) research of the objectives through private study, (7) reporting back, synthesis of explanations and application of new information to the original problems. This process was one of the first ones implemented for PBL medical teaching at the University of Limburg in the Netherlands. Capturing the essence of the PBL philosophy and stages we adopted our own version of it for our medical Spanish language courses. This is illustrated in figure 2 below.

1. case presentation
2. identifying key information
3. generating and ranking hypotheses and/or methods to approach the problem.
4. generating an enquiry strategy or deciding on tasks and responsibilities for each team member to tackle the problem and choose resources
5. defining learning objectives
6. reporting back

Figure 2. Suggested PBL stages for a medical language course.

1. case presentation: the tutor presents the class with clinical information about a real or hypothetical patient. This information can be quite versatile and take various formats (text based clinical scenarios like the one illustrated in figure 3, experimental or clinical laboratory data, photographs, video clips, newspaper articles, articles from scientific journals, etc.). The students had read this case previously at home in preparation for the class and, ideally, have discussed a similar case or sometimes exactly the same case in her PBL medical tutorials. This usually gives them more confidence to justify and defend their hypothesis in the target language.

**KAREN**

Tópico: Enfermedades de transmisión sexual (ETS)

Karen estuvo tomando *Logynon* por 18 meses pero se le olvidó tomar esta píldora de forma continuada y se quedó embarazada. Siguió adelante con el embarazo y ahora vive con su hija Laura de dos años en un piso alquilado. Kevin es camionero de larga distancia y va a Amsterdam cada semana pero se queda con Karem casi todos los fines de semana.

Es viernes por la tarde y Karen ha pedido una cita urgente en su clínica. Le duele el estómago y quiere hacerse una revisión de su DIU (dispositivo intra uterino). Su último periodo fue hace dos semanas y desde entonces tiene una secreción desagradable y maloliente. En los últimos días no se encontraba nada bien. Ha desarrollado dolor en la parte baja del abdomen y sus heces son más bien líquidas.

Su fosa ilíaca derecha resulta suave a la palpación. El DIU está ahí. La paciente muestra una marcada suavidad en el fórnix derecho, hay excitación cervical y una secreción de color verde. Se deben hacer cultivos para analizarla. ¿Necesita una prueba de embarazo? ¿Por qué estas cosas siempre pasan los viernes a las seis de la tarde?

Figure 3: Extract from a text-based clinical case for one of the PBL tutorials.

2. identifying key information: this involves discussing, extracting, identifying and, most importantly, summarising information.
3. generating and ranking hypotheses and/or methods to approach the problem. This involves some brainstorming from the students as organised in groups.
4. deciding on tasks and responsibilities for each team member to tackle the problem and deciding on the choice of resources
5. defining learning objectives: For this part of the learning process they should be able to assess what they know, what they do not know and what they need to know to be able to understand the underlying mechanisms and their ability to solve the clinical problem. The language tutor can take advantage of this stage by encouraging students to do some definitions or short explanations of terms or procedures such as the process and complications of inserting an intrauterine device in this particular case.
6. reporting back: in this last stage students report on their assumptions and share new knowledge with other classmates who may dispute or agree with them. This can take the form of a PowerPoint presentation. The students' contribution to this stage is beneficial to the whole class for every student has a unique perspective to share and their collaboration is essential to knowledge building and language practice alike. Moreover, their exchange and debate of ideas promotes consolidation of knowledge and understanding of clinical mechanisms/procedures.

In terms of assessment, one of the key characteristics of any PBL course is the change in focus from tutor assessment of outcomes of learning to student self and peer assessment (Boud, 1985). This promotes independent learning, acknowledges process as well as product/content evaluation and involves a great deal of teamwork. In PBL assessment, apart from language-based and content-based criteria, parameters such as critical thinking, problem-solving skills, communicative and collaborative skills should be considered. Some forms of evaluation include group presentations, reflective essays and role-plays.

## **2. e-PBL**

The term "blended PBL", was coined by Graham (2004) to reflect the idea that students learn through the combination of online and face-to-face instruction. PBL can be designed to complement lectures or traditional classes and computer-assisted learning. E-PBL or the combination of PBL and e-learning provides an effective platform to integrate electronic learning resources such as interviews with patients, scanned images

of medical histories, prescriptions or access to a wide variety of web-based resources, including podcasts, and video documentaries, interviews and clinical cases. Such resources can facilitate independent learning and foster reflection raising students' awareness and problem solving skills in specialist language courses.

Savin-Baden (2007:17-19) provides the following reasons for combining PBL and online PBL: it offers more flexibility for students; it is an innovative approach for using in the context of distance learning; blended PBL learning would enhance both the pedagogical and technological experience of students; it works well for interprofessional learning; online facilitation can be more effective than face-to-face facilitation; provides a means of integrating diverse learning resources through one teaching approach; promotes and enhances collaborative learning beyond the classroom experience; reduces students' isolation and provides more support; offers the students more choices about what, when and how they learn; and is a way of engaging students in learning tasks to fit with their social networking practices, particularly those such as 3D virtual worlds, mobile learning and social networking tools. Of all these reasons the diversification of resources, the practice online collaboration and the direct link of online PBL with mobile learning technologies constitute three innovative ideas for implementation in any specialist language VLE. In particular the exploitation of virtual worlds such as *SecondLife* brings endless opportunities for contextualised specialist language practice in ever growing islands such as replicas of hospitals and conference centres where students can interact with specialists and professionals in the TL.

E-PBL allows the combination of a wide variety of online tools that can help boost the specialist language learning experience. Some examples of e-tools that can support blended problem-based learning activities are the following:

- webpages, wikis or blogs to present complex problems and to evaluate solutions
- online calendars to indicate deadlines if the problem is to be solved throughout various sessions
- online discussions forums for negotiations during and after the research process
- shared whiteboards for brainstorming and negotiating
- e-mail or chat tools to reflect on action to be taken
- videoconferencing to report back
- tools for submission of group work
- assessment tools such as computer marked tests, e-portfolios, online journals, blogs or team wikis
- content tools such as syllabi, learning modules, course notes or handouts
- administrative tools to do selective release of content, divide the students into groups or track their participation online

All these e-tools can support the communication and collaboration necessary for effective problem-solving in blended and distance learning scenarios.

### **3. The Medical Spanish VLE**

In the design of any online PBL course Savin-Baden (2007:131) recommends focusing on what we want students to learn, plan the module/programme well and in good time and ensure the problem scenarios are well designed and tested before implementation.

The Medical Spanish VLE (see figure 4) was born as a supporting blended learning platform for Medical students of Spanish, as part of the European Option Programme. The European Option of the MBChB offers Medical students the opportunity to study a language alongside their medical studies. They attend four years of language tuition and then carry out a clinical placement in one of our partner universities in Spain (currently Universidad Autónoma de Madrid, Universidad Complutense de Madrid and Universidad de Granada). The language classes focus on the development of the general language skills required to communicate, provide an essential introduction to Medical terminology

and phraseology, and also include the discussion of various clinical cases from various medical specialties. In order to progress in their language skills students take part in various formative and summative assessment tasks. Some of these are orientated towards obtaining a recognised language certificate in Medical Spanish issued by the Cámara of Madrid: *Certificado Básico de Español para las Ciencias de la Salud* (level B2 after year 2) and *Certificado Superior de Español para las Ciencias de la Salud* (level C1 after year 4). One of the downsides of the programme is that students only have two hours of face-to-face language tuition a week. In order to compensate for this we adopted a blended e-PBL learning approach heavily based on e-resources developed via the University Blackboard website. One of the main purposes of the VLE was to complement lectures and help students prepare for their internal and external examinations. The site also proved to be beneficial for intercalating students who, for various reasons, decide to postpone their clinical placements in Spain and need to keep updated with their language skills during intercalation and, eventually, during their year abroad.

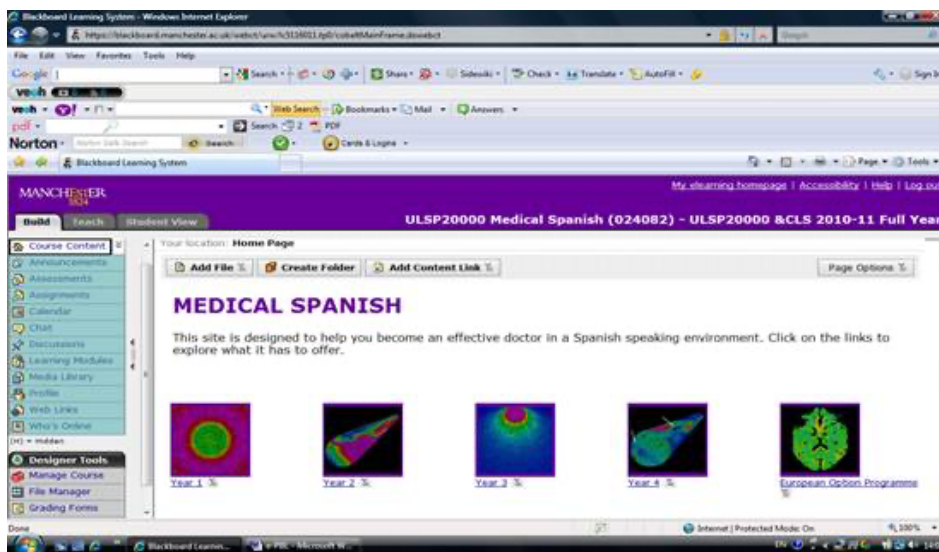


Figure 4: Snapshot of the main site of the Medical Spanish VLE.

In the design of the website we took into consideration various aspects:

- the four year division and, consequently, the different target groups and their needs
- the differing language levels
- the main purpose of the site
- the learning outcomes and learning objectives of each session
- the delivery mode, i.e. blended teaching
- the PBL methodology and its key stages
- the combined language and content-based curriculum
- the immediate need for independent learning assessment, immediate feedback, follow-up activities and online discussions after the class to encourage collaborative interactive participation
- the need for a repository of relevant information about the four years in general and about the resources needed for each of them

Our ultimate goal was to provide an effective VLE to support the independent learning of medical Spanish. In the last few years there has been much criticism about interactive online environments not providing effective learning platforms (Oliver and Herrington 2003) and providing a mere transformation of course content into interactive



format. To try and compensate for this Oliver and Herrington (2003:15) suggest a more flexible approach:

In learning environments that support knowledge construction learners need to be exposed to a variety of resources and to have choices in the resources that they use and how they use them.

This summarises our main philosophy in the design of the Medical Spanish VLE where we adopted a hybrid approach to PBL that combines traditional language classes with PBL tutorials and a wide range of e-tools to help students discuss specific clinical scenarios and engage in various language practice activities.

As integrated in Blackboard, our VLE consists of a wide range of e-tools to support teaching and learning. These include:

- course content tools: course syllabus (good layout of class by class contents divided per language skill with homework / follow-up activities for extra practice and preparation for the following class, to make learning easier), clinical cases embedded in the course syllabus, informative sites about the European Option programme (e.g. handbook, partner universities), students' reports on their clinical placements abroad, grammar tools (clear grammatical explanations with external links for further practice), podcasts and videos on various clinical procedures, anecdotes, culture-related sites and extracts from masterclasses conducted by medical specialists.
- communication tools: for asynchronous interaction such as discussion fora (with relevant topics from the course syllabus for discussion outside class) and email; and for synchronous interaction i.e. as chats, videoconferencing facilities ( *Wimba Classroom* ) that promote social engagement and collaboration
- formative assessment tools (such as interactive quizzes, self-tests, practice tests like the one depicted in figure 5, *Voiceboard* ), which provide varied feedback of relevant course and external examination contents to encourage students' motivation and progression

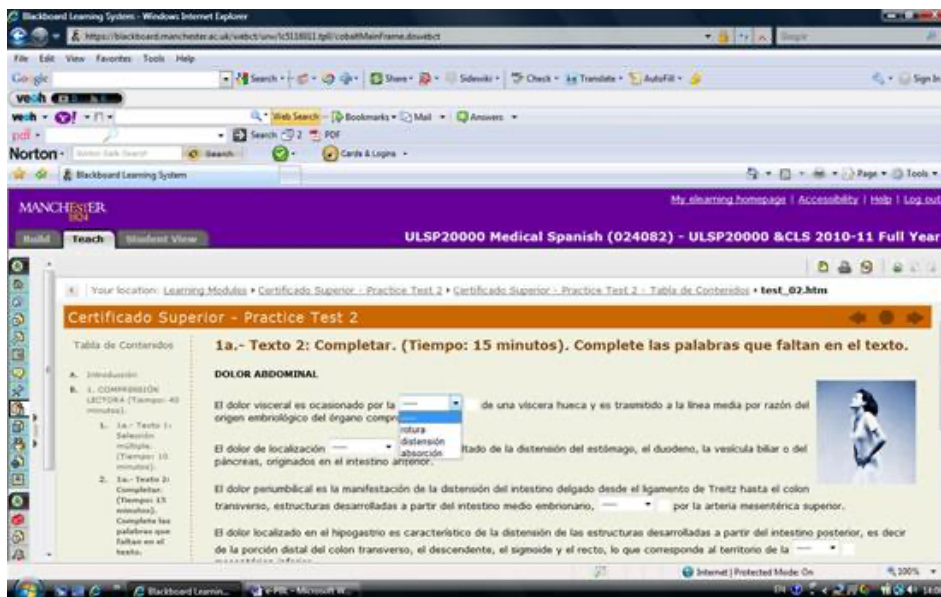


Figure 5: Snapshot of one of the Medical Spanish practice tests.

- administrative tools such as records of past performance, assignment submission drop boxes, contact information, *GradeMark*, *Turnitin*, students tracking tools etc
- extra resources: indexed list of useful online resources for the students, glossary of medical terms, media library with rich audio and video links, terminology and phraseology flash-cards.

Looking on to the limitations of any virtual learning platform, we are aware that the use of technology per se does not guarantee neither the integration of an e-learning component into a language programme nor the development of autonomous learning opportunities unless we plan various means to provide guidance, feedback and support throughout the PBL process. Other important factors to consider are the relevance of the activities to the students' goals, their learning styles and language level among others.

#### **4. Summary**

This paper described the development of a blended VLE for the teaching of medical Spanish via PBL. This platform, which has been in use for over five years now, has been welcome by students as an effective way of complementing face-to-face tuition and getting support for the preparation of their internal and external examinations. Various aspects that contributed to the successful implementation of this model in a blended learning platform were described with particular emphasis on the following: its constructivist foundations that facilitate the integration of content-based knowledge and social interaction by means of specialist language use, the adoption of a PBL process-based layout to structure many of the sessions, the incorporation of clinical cases that are relevant to the students and appropriate to their level of understanding, the use of clearly defined learning objectives and appropriate scope for the class time and level, the nature of PBL that is meant to mirror the complexity of real-life problems, the collaborative interaction and negotiation practice throughout the process together with multiple opportunities for feedback, the variety of e-tools embedded in the VLE with resources such as interactive self-tests and quizzes, podcasts, videos, discussion fora, etc. that provide an engaging platform for independent language learning. Last but not least, this VLE is flexible and versatile in nature and can be adapted for other languages and/or levels of competence.

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**Notes**

(1) According to Brooks and Brooks (1993) learning is the process of constructing knowledge in social environments. For this purpose learning tasks should be embedded in the target context and should mirror scenarios that appear in real life.

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