



Slovene Association of LSP Teachers

# **Guide to Problem-Based Learning**

**PBL within the Context of ESP**

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## FOREWORD

If you are reading these lines, you are probably a teacher of a foreign language for specific purposes (LSP) willing to engage in new teaching and learning adventures, or are simply curious by nature.

What you have in your hands is the *Guide to Problem-Based Learning*, which has been written with the awareness that only a student-centred and learning-centred interdisciplinary approach enhances the development of linguistic, practical and cognitive skills as well as extralinguistic knowledge. Today, when increased job marketability has become a significant competitive advantage for our students, these bear vital importance within the field of LSP teaching.

The *Guide to Problem-Based Learning* has been written with LSP teachers in mind. We are confident that it can be used to the benefit of all LSP teachers and students at the tertiary and secondary levels of education as well as of learners in professional environments. Nevertheless, if you wish to introduce problem-based learning into your syllabus, we recommend that the language proficiency level of your students be at the level of ‘B1 – B2’ – Independent User (according to the Common European Framework of Reference) at least. Our experience also suggests that the best moment to implement problem-based learning is when learners already have some discipline-related knowledge (there are no similar constraints for in-service learners).

We hope that this *Guide to Problem-Based Learning* can serve as a useful tool to any LSP teacher who is willing to introduce new challenging methods into the teaching environment or who is in need of a tool that can be used to review, support or structure what is already being done.

The *Guide to Problem-Based Learning* can certainly provide useful ideas to individual teachers. However, here is another idea to consider: before incorporating PBL into your teaching situation, you may decide to engage in PBL as a group, reading sections of the *Guide to Problem-Based Learning* and discussing them with other LSP teachers or with subject specialists. Such an establishment of common understandings and potential difficulties, particularly if shared with collaborating subject teachers, could provide an ideal basis for successful implementation of the approach. In this way it would also be easier for you to consider changes you would like to make to the procedures examined in our *Guide to Problem-Based Learning*, thus beginning to take ownership of, and responsibility for, your own PBL project, adapted to your specific teaching situation.

The *Guide to Problem-Based Learning* is divided into four major chapters and three subchapters. The four major chapters, in which you will find all necessary information to guide you through the problem-based learning process, are:

- Chapter 1: PBL PRE-STEPS (p.6) – the steps that you will take before the beginning of the problem-based learning cycle (contacting subject teachers, problem design, and team building),
- Chapter 2: PBL CYCLE (p.16) – the 7-PBL-Step model that will guide your students through the research related to their problem,

- Chapter 3: PBL PRODUCTS (p.34) – information on the main products of the problem-based learning process: report and presentation,
- Chapter 4: PBL ASSESSMENT (p.52) – information on report, presentation, and process assessment in problem-based learning.

In the three subchapters at the end of the *Guide to Problem-Based Learning* you will find some ‘frequently asked questions’ with answers (p.65), appendices referred to in the four major chapters (p.69), and tips for further reading (p.76).

The *Guide to Problem-Based Learning* contains references for language input activities where applicable but does not provide any materials to photocopy because we are confident that you will select and adapt the materials most applicable to the language learning needs of your students.

Each chapter consists of sections that contain a general introduction, instructions as to what to do to successfully carry out each phase of the problem-based learning process, references to language input, and sample documents where these apply. Acting as a compass, each section is preceded by an extract from the general scheme of the problem-based learning process. The extract will enable you to determine at which stage of the problem-based learning process you are at any given moment.

The *Guide to Problem-Based Learning* has been devised as a flexible instrument, which means that in some cases, where more than one option is available, it is up to you to decide which of the suggested solutions you will focus on during the process and to which you will dedicate less explicit teaching attention. Your choice depends above all on the knowledge and skills that your students already have (e.g., giving presentations, taking minutes...).

The *Guide to Problem-Based Learning* has developed from a three-year problem-based learning project conducted in Slovenia from September, 2000, to September, 2003, under the following mission statement:

“To make a shift from developing the traditional four language skills to developing the knowledge and skills needed by learners who want to be successful in real-job situations in an information society. The project will focus on the development of independent problem solving skills, creative thinking, cooperation and productive team work, flexibility in adapting to a changing environment, in order that students become self-directed, life-long learners.”

What our group has achieved would not have been possible without the supportive and productive atmosphere that permeated our group throughout the three-year project. What I would like to emphasize is that the present *Guide to Problem-Based Learning* that talks about PBL as a group process in fact is a result of a group process. Whatever innovation you are trying to implement, it is beyond doubt that it is more likely to succeed in a supportive atmosphere where colleagues are collaborating with a common purpose in mind.

The basic concept of the PBL project, upgraded and supplemented by the project group, derives from the international project TENTEC (Teaching English for Technical Purposes). Participation in our project enabled all contributors to be personally involved

with implementing problem-based learning in our teaching contexts and to gain the necessary knowledge to engage in the production of this *Guide to Problem-Based Learning*.

The first phase of our project covered the experimental introduction of problem-based learning into a variety of teaching contexts. The second phase focused on the research of problem-based learning areas that had been identified as weaknesses during the first phase that therefore required further research (i.e., alternative methods of product and process assessment, problem-based learning with weak students, co-operation with subject teachers, and team management skills). Finally, the third phase consisted of the dissemination of the model through international conferences, publications, and an international problem-based learning workshop organized by the project group in September, 2003.

The *Guide to Problem-Based Learning* has been written by eight project group members:

- Bernarda Kosel, Faculty of Mechanical Engineering, University of Ljubljana.
- Dubravka Celinšek, Faculty of Management, University of Primorska.
- Irena Kuštrin, Faculty of Social Work, University of Ljubljana.
- Melita Djurić, School of Foreign Languages, Ministry of Defence of the Republic of Slovenia.
- Mojca Jarc, Faculty of Social Sciences, University of Ljubljana.
- Nada Vukadinović, Faculty of Natural Sciences and Engineering, University of Ljubljana.
- Šarolta Godnič Vičič, Turistica – College of Tourism, University of Primorska.
- Violeta Jurković, Faculty of Maritime Studies and Transport, University of Ljubljana.

We appreciate the energy and knowledge invested into the project by the other project group members who are:

- Marija Lešnik – Faculty of Agriculture, University of Maribor.
- Alenka Gvardjančič – Faculty of Administration, University of Ljubljana.
- Lučka Pristavec – Faculty of Mechanical Engineering, University of Maribor.
- Andreja Drobnič Vidic – Faculty of Mathematics and Physics, University of Ljubljana.

We would like to thank Ddr. Barica Marentič Požarnik and Dr. Julian Edge for their invaluable comments and suggestions.

Last but not least, without the financial and moral support of the British Council in Ljubljana that has been an essential partner in the project since its inception, and the donations received by the Faculty of Management of the University of Primorska and the Faculty of Natural Sciences and Engineering of the University of Ljubljana the publication of this *Guide to Problem-Based Learning* would not have been possible.





# INTRODUCTION

The phrase 'problem-based learning' reveals that this is a learning method based on solving problems. It was adopted from the field of medicine in the 1980s and was introduced into the teaching of foreign languages for specific purposes with the desire to implement a model that combines what have long been considered essential distinctive elements of languages for specific purposes: language and discipline-related knowledge.

Problem-based learning is a modern and innovative approach to language teaching. It is an approach to structuring the curriculum that involves confronting students with problems from practice that provide a stimulus for learning. Given that teaching does not automatically lead to learning, problem-based learning is viewed in the context of an approach to learning rather than as a teaching technique. Therefore, the quality of the learning outcomes that students attain is to a great extent determined by the learning activities they engage in.

In the contemporary views there are growing tendencies to found teaching on the ways how people learn. Passive learning should be replaced by active learning. This involves active, genuine learning, which is characterized by the following features: its results can be used inside as well as outside a concrete learning situation; learners develop a deep understanding of a discipline studied; the knowledge could be transferred to other fields; and, learners are able to reflect on their own learning process.

Research on learning suggests that students may approach learning in two – qualitatively very different – ways: through a deep approach, in which they aim to understand ideas and seek meanings, and try to relate new things to the existing knowledge, and through a surface approach, in which they see tasks as being imposed on them and they study without reflection on purpose or strategy. Problem-based learning provides a context within which a deep approach is indispensable.

In addition, problem-based learning is based on the constructivist approach to learning. Constructivism is a philosophy based on the fundamental assumption that knowledge cannot exist outside our minds. Knowledge cannot be given from one mind to another. Accordingly, new knowledge is constructed or created from within individuals through experience. Therefore, it is of utmost importance for teachers to understand and adopt this new philosophy and provide the students with opportunities for the creation of new knowledge.

Adding the element of problem-solving and hence higher-level cognitive skills to task-based learning, problem-based learning is a process-oriented approach. It stimulates the development of all language skills: speaking (e.g., through the exchange of information among group members and sustained monologues), reading (e.g., for gist and for specific information), listening (e.g., to other group members while exchanging information, at presentations), and writing (e.g., minutes, notes, report). In addition, through these activities, problem-based learning provides opportunities for the acquisition of general language and subject-specific knowledge. As mentioned, problem-based learning also develops other (practical and cognitive) skills and strategies: inter-personal and intra-personal skills, research skills, the use of computer software, and critical thinking, to mention just a few. Problem-based learning also

introduces innovative assessment forms – self-assessment, peer-assessment, group assessment, and the use of the Portfolio. And finally, we should not forget that only by providing challenging opportunities for autonomous learning can we equip our students with the skills necessary for efficient life-long learning.

During the process, problem-based learning will, at least to a certain extent, change your role as a language teacher. As opposed to teacher-centred approaches, in problem-based learning the language teacher becomes an observer of the process and a facilitator when the need for help is expressed by the students. Problem-based learning will also require you to cooperate with the subject teachers involved.

Problem-based learning projects are carried out in student-directed teams, where the whole group needs to use a foreign language to solve a real-world problem related to a particular field of study and present the outcomes in the form of a group report and a group presentation.

For a successful completion of the problem-based learning process the students need to have/develop a variety of skills (e.g., writing the report, giving presentations, taking minutes). It is up to you to decide whether you will teach these before the beginning of the process or only when the need for the teaching of a certain skill arises.

At the beginning of the process, students are divided into groups and are assigned a real-life authentic problem related to their study discipline. From this point to the report writing stage, problem-based learning relies on the 7-PBL-Step model, which is applied to provide a clear structure for the entire process.

The first five steps of the 7-PBL-Step model take place during the first meeting of the problem-based learning groups in the language classroom:

	PURPOSE	ACTIVITY	TIME
PBL Step 1	Making the problem clear.	Each group of students is given a problem and tries to understand it. The roles within the group are divided.	15 minutes
PBL Step 2	Formulating questions and queries.	A brainstorming session results in the production of ten questions related to the problem.	15-30 minutes
PBL Step 3	Identifying current knowledge and learning needs.	Each group has to find out how much its individual members already know about the questions from the previous step.	15 minutes
PBL Step 4	Structuring ideas.	Drawing a mind map, students decide which ideas belong together and group them around the questions. The group decides what has to be learnt and what requires further research.	30 minutes
PBL Step 5	Formulating the learning aims and distributing assignments among group members.	Each student is assigned the task of searching for more information about a particular aspect of the problem.	30 minutes

After the first five PBL steps, students are given time for out-of-class research (PBL Step 6).

PBL Step 6	Individual activities/research.	The research continues for at least a week during which time students can consult various sources and find information leading to a solution to their problem.	One to several weeks
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The second meeting of the groups (PBL Step 7) takes place in the language classroom.

PBL Step 7	Discussing and evaluating information.	Students try to provide an answer to the question: "Do we have enough relevant information to defend our case?" A positive answer leads to the report writing stage while a negative answers leads the students to additional research.	45 minutes
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During PBL Steps 1-5 students try to find out if they understand the essence of the problem, write questions about the problem that will help them identify what is already known and what remains to be researched, and distribute research assignments among group members.

During PBL Step 7 the students discuss and evaluate the information each student has found during the time allocated for individual research (i.e., PBL Step 6).

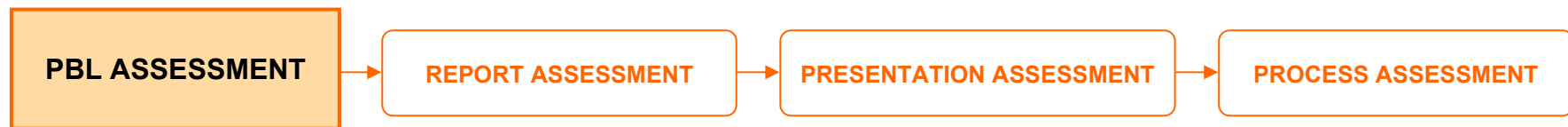
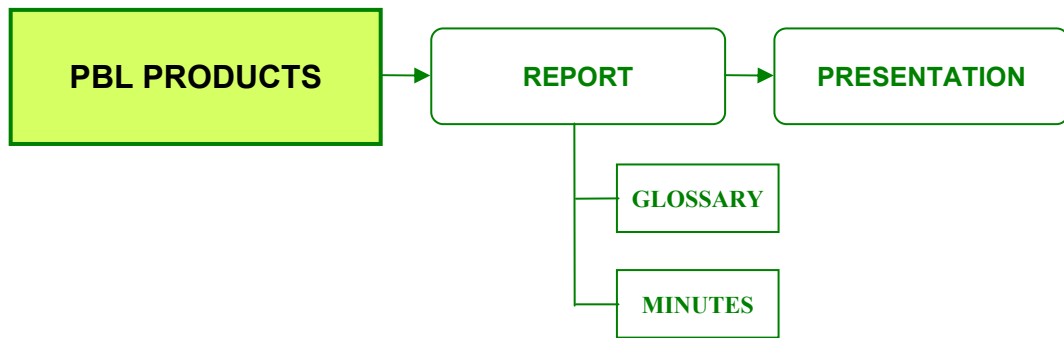
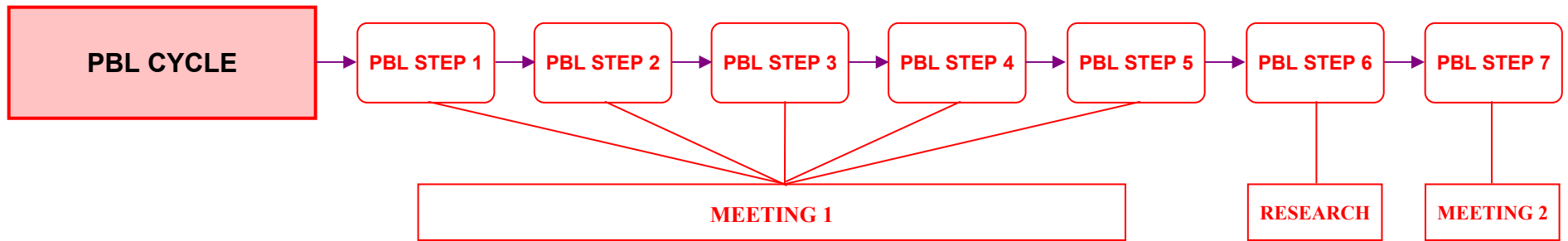
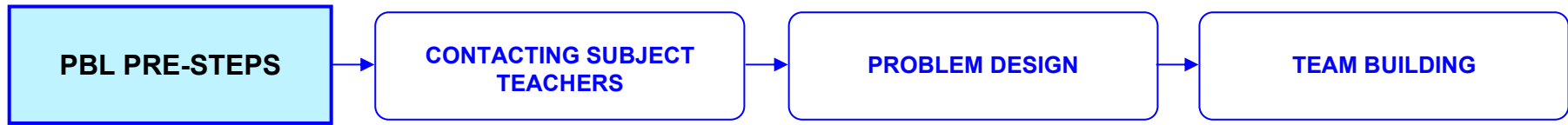
At each meeting the minutes are taken; these are attached to the final report and are a tool that provides the teacher with an insight into the group dynamics and other processes inherent to the group.

The next phase of the problem-based learning process is report writing. The final version of the report is used as the basis for the preparation of an oral presentation. Supplementary products of the problem-based learning process are also the glossary of terms, minutes taken during each group meeting, mind maps, summaries of readings, etc.

Finally, both main products are assessed in accordance with assessment criteria presented to the students at the beginning of the process. The linguistic aspect is assessed by you while the contents of the report (and/or presentation) are assessed by a subject teacher, also involved in the process.

We recommend that before the beginning of the process you provide your students with a student guide to the problem-based learning process that includes information on the process, the deadlines to meet, the products to be submitted and presented, assessment forms, and any other items you believe may be necessary or helpful.

The structure of the problem-based learning process is presented in the scheme on the following page.

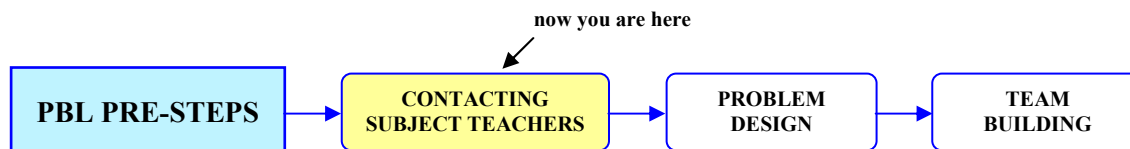


# 1. PBL PRE-STEPS

In this chapter you will read about the steps that you have to make before the beginning of the problem-based learning process.

## 1.1 Contacting subject teachers

*Violeta Jurković*



Problem-based learning is an interdisciplinary approach to foreign language teaching, which implies that it involves the participation of at least three parties in the process: the students, you and the subject teacher(s). There can be other language or subject teachers involved, of course. We should always keep in mind that working together and sharing experience is the most significant factor of a teacher's professional development. The subject teacher is anybody who teaches a discipline-related course. Your students can work on problems related to several different courses and that therefore require the cooperation of more than one subject teacher.

The cooperation with subject teachers brings several benefits. First, it provides the assurance that the designed problems are relevant to a specific discipline and also up-to-date. Second, the subject teacher is a good source for relevant and up-to-date sources that the students can refer to during their research. The subject teacher also is the only qualified assessor of the discipline-related contents of the final reports. In addition, the students will take a different (more motivated) attitude to report writing – in particular the contents of the report – if they are aware that it will be assessed by a qualified assessor. Last but not least, interdisciplinary teaching may also promote language teaching within institutions.

We should also consider the benefits that problem-based learning generates for subject teachers. Among these are 1) the relevancy of the language teaching content and the development of the students' disciplinary knowledge within the language course, 2) the production of bilingual glossaries of report-related terminology and the consequent development of the terminology in the mother tongue, 3) a richer variety of teaching methods, and finally, 4) a higher level of student motivation.

Having established why the cooperation with subject teachers is necessary and fruitful for all of us, let us consider which subject teachers to contact. Your decision can be based on the curriculum and overlapping syllabuses, students' wishes, course requirements, friendship, and/or interest in cooperation expressed by the subject teacher.

Bear in mind that the best moment to contact the subject teacher is *before* the beginning of the problem-based learning process in your classroom. Your ideas about the extent of

cooperation that the subject teacher(s) is willing to engage in should be quite clear before problem-based learning actually starts.

Within the problem-based learning process, the subject teacher can play some or all of the following roles:

- problem designer – always try to design the problems together with the subject teacher, ask for ideas or approval (see: Problem design, p. 8),
- advisor – advise the students that they should turn to the subject teacher for advice regarding bibliographical use. The subject teacher should make sure that students can contact him/her when necessary (see: PBL Step 6: Out-of-class research, p.27),
- assessor – both teachers can act as assessors; you will assess the language aspect of the written report and/or oral presentation while the subject teacher will assess the contents of the written report and/or oral presentation (see: PBL ASSESSMENT, p.52).

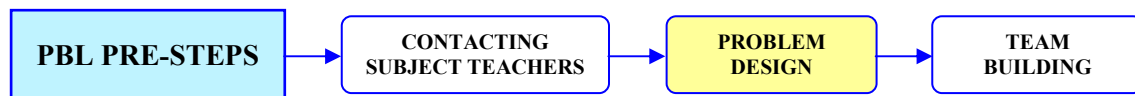
In conclusion, what did two language teachers say about their cooperation with subject teachers?

*“My subject teachers always cooperate in problem design. I sometimes reject some of their ideas because they remind me of exam questions. My decision is always accepted. They also provide starting points in terms of the sources and are always available during their consultation hours. Occurrences when subject teachers were not available, when they were out of the country, for example, are extremely rare. My subject teachers assess the contents of the written report, they also assist presentations, where they ask questions. Generally, my experience is good. I must say it’s easier to work with younger colleagues. Problem-based learning requires a lot of coordination: I have to send written requests for cooperation, suggest deadlines, invite to presentations, etc.), but it’s definitely worth it. I also think that problem-based learning has a very positive influence on our teacher-teacher relations, it leads to more respect for language teachers because they see that we’re teaching something useful. Of course, we always learn something new about the discipline, too.”*

*“My problem is that the English course only covers the first semester of the freshman year so it’s difficult to cooperate with anybody. But I’m lucky because my ‘roommate’ is an expert in social work with the elderly and she’s always ready to check the problems that I design. Last year we tried to carry out the complete problem-based learning process together but again the problem is that my students have to be finished with it as early as December, which is far too early for her. That’s why I do not have a subject teacher–assessor but I certainly hope I’ll manage to change that this year.”*

## 1.2 Problem design

*Irena Kuštrin*



### 1.2.1 Introduction

Problem-based learning uses problems to initiate and motivate student learning; therefore the selection of appropriate problems is critical to the success of the project. If the problem is not designed in such a way as to attract the interest of the students, the project is likely to fail.

When designing problems, the teacher should not forget that problem-based learning is

- a problem solving activity and
- a cross-curricular approach to teaching a foreign language.

The teacher will thus have two concerns when introducing problem-based learning into the language course:

- How do you design a good problem (what is a good problem like? what are the criteria a teacher should follow when designing it)?
- Who should design it (the language teacher, the subject teacher, the students)?

Since problem-based learning is a problem-solving activity, one should distinguish between a problem and a task: whereas a task is just one thing (of the possibly considerable number of things to do in order to solve some kind of wider goal), a problem is a complex of tasks requiring new information, information exchange, thought and decision-making.

Let us first look at the characteristics of a good problem:

- A problem should be concerned with real life situations; the students should not get the impression that it is just an artificially produced case for teaching purposes. An interesting, motivating problem which is relevant to the professional field will engage students' interest and motivate them to probe for deeper understanding of the issues addressed. Of course, the problem should be placed in a context with which students are familiar.
- Good problems require students to make decisions or judgments based on facts and information gained from diverse information sources they used during their research. Students should also be required to justify the decisions they make. Problems should require students to define what information is relevant and what steps or procedures are required in order to solve a problem.
- If possible, the problem should be open-ended in terms of offering different solutions. Controversial issues that will elicit different opinions will encourage the students to enter into discussion. Exchanging their views will promote their functioning as a group.



- The content objectives of the course should be incorporated into the problems. The students should be encouraged to connect previous knowledge to new concepts and connect the new knowledge to concepts of other courses.
- Cooperation from all members of the group should be required in order to effectively solve the problem. Problem-based learning should not be about competition between the group members, it should be understood as a “joint venture”.
- The problem should also consider the interests and the needs of the students and their future careers.

### **1.2.2 Finding good problems**

You will find that only a few ready-made problems which would suit your specific LSP situation are available in books or teacher manuals or on the internet. Therefore, if you decide to introduce this method into your classroom, you will have to design your own problems. Before doing that, you have to consider the proficiency level of your students, particularly in terms of the mixed ability classes that most of us teach.

At a lower level, the problem can be designed as a kind of end-of-chapter problem, for which the information required to solve it is provided within the teaching material (or the teacher provides additional sources).

At a more advanced level, not all the information needed to solve the problem is given in the textbooks; the students will need to do some research, discover new material and arrive at judgments and decisions based on the information learned. The problem may have more than one acceptable answer.

### **1.2.3 Designing a good problem**

The problem should be related to previously learned knowledge; therefore it is important to choose a central idea, concept or principle that you teach in your course and that the students are likely to encounter in professional practice in the future. Think of a problem, an assignment, or homework that you might give to your students. You can look for real-world contexts in magazines, newspapers, or articles in specialist literature as a basis of a problem. Of course, you should also think of talking to professionals in the field for ideas of realistic applications of the concepts you are teaching (see: Contacting subject teachers, p.6).

It is a good idea to provide a challenging title for the problem because it will probably engage student interest. This is important because at the beginning students tend to be insecure about the problem, or even afraid of what is coming. A challenging, provocative question or a statement as a title of the project might break the ice and make the students realise that problem-based learning could be fun, not just another boring assignment. Visuals, provocative questions, statements and dilemmas will help clarify the problem for the students. It is important that the problem be well defined because otherwise the students will lose too much time in trying to find the focus of their work. This will be the case if the problem is too general or its description too vague. When designing the problem, you should think of what end-product the students are expected to produce at the completion of the problem.

The problem should be designed in such a way that it requires the solution of a problem, not just a description of a situation. Another consideration is whether literature in a

foreign language is available for the topic. Otherwise the students will only produce a poor translation of a mother tongue text.

Let us now take a look at these two problems:

**THE PROBLEM OF UNEMPLOYMENT IN SLOVENIA**

In Slovenia there are over 100,000 unemployed people. Describe their situation (reasons for unemployment, their financial situation, opportunities for getting employed again, etc.). What should be done in order to increase the employment rate in Slovenia?

**HELP ME FIND A JOB!**

I (female, 43) lost my job because the firm I was working for as an administrative clerk closed down. I must admit I only have a very restricted knowledge of IT (word processing) and I do not speak any foreign languages, either. Yet, I am willing to learn, since I still have to work for about 15 years before I can retire. And besides, I also need the money. Being a single mother with two children who still go to school, I cannot subsist on the unemployment benefit I am receiving now.

What can I do to improve my chances on the job market?

Comparing the two problems above it becomes obvious that the first one is too general. Although it does require a solution to a problem (what should be done in order to increase the employment rate in Slovenia?), this problem undoubtedly presents a very complex issue, for which the students have to research many different areas (reasons for unemployment, general labour market situation, opportunities for getting employed again, possibilities for additional training, legislation regulating this area, age and sex discrimination, benefits for the unemployed, etc.). What then should the focus of their work be?

The second problem is personalised. What the students have to do is to research a specific situation; in the case of students of social work the problem is related to the previously gained knowledge within the subjects of Labour Law and The Quality of Working Life, and also within the subject English Language (one of the topics discussed being Welfare State Slovenia).

Undoubtedly, the problem is a well-defined “real-world problem”. The end product the students have to produce (what can I do to improve my chances on the job market?) is well focused and during a brainstorming session the students will probably come up with questions like: What additional knowledge would offer better chances for employment? What kind of courses are offered by the Employment Agency? What role does the age of the unemployed person play? What is the legislation regulating this area like? What financial benefit is this particular unemployed person entitled to?

Since problem-based learning in language teaching is a cross-curricular activity, the language teacher should seek the collaboration of a subject teacher when designing problems. It is not always easy to establish such cooperation: subject teachers have their own work and might therefore refuse to take part in a project which will require extra work from them. Another obstacle might be that the subject teachers often have an entirely different concept of what a problem is. Our experience shows that the themes they suggested were often too general and the description of the problem too vague, or their problems were formulated more as exam questions than as real problems. As the initiator and launcher of problem-based learning, you should therefore provide some general information on problem-based learning (and problem design) for the subject

teachers. If no subject teacher can be induced to cooperate at this initial stage of the project, you can design the problems yourself. After all, you have familiarised yourselves with the syllabuses of the specialist subjects, the textbooks and other materials the students use. Nevertheless, as a language teacher you are no expert in these specialist fields and it is therefore recommended that a subject specialist checks and approves of the problems suggested. This is the best way to provide professional relevance for your students.

Some students may ask you if they can choose/design a problem by themselves. Of course this is possible: the advantage is that the topics chosen are obviously of particular interest to the students. It is important however that you give some information on what a 'problem' is and then monitor and direct the process of problem design. As with other problems not designed by – or together with – a subject specialist, it is important that the latter checks them for professional relevance.

#### **1.2.4 Sample problems**

For sample problems related to various study disciplines, see: Sample problems, p.69.

In the chapter PBL Cycle you will find several extracts taken from sample minutes. On p.23 there is also a mind map. All of them are related to the following sample problem taken from the discipline of transport and traffic:

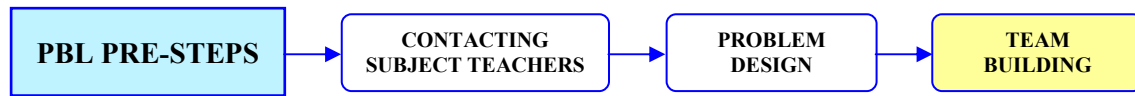
##### **EASYJET IS COMING – WHAT WILL ADRIA DO?**

Adria Airways is Slovenia's national carrier and has rich experience in charter and scheduled flights, while EasyJet is a low-fare European airline. Flying to London and back from Ljubljana with Adria Airways will cost you approximately 400 Euros, while flying with EasyJet on the same route can cost you as little as 20 Euros.

How can Adria Airways survive against such strong competition?

## 1.3 Team building

Melita Djurić



One of the basic goals of problem-based learning is teamwork. Many students like individual study and therefore teachers usually do not offer enough opportunities to learn in teams. Experiencing a different approach may change the students' attitude toward teamwork. Since problem-based learning is a longer process, it is very important that the students who work together in a team feel involved, accepted and integrated. This is the only way for a team to be effective.

### 1.3.1 Forming a team

There are different approaches to forming teams:

- **A** Interest in a problem.
- **B** Friendship bonds.
- **C** Teacher-appointed teams.
- **D** Language proficiency.

#### Approaches A and B

Both are very spontaneous and do not take much classroom time. In **A**, topics/problems attract students' interest and in **B**, friends gather around problems. It is difficult to clearly differentiate between **A** and **B** since they share a common interest in a problem. The most important difference is that in **A** the interest in a problem is very strong while in **B** friendship prevails over interest. Our experience shows that a common interest forms a good basis for further learning within the team.

#### Approach C

You appoint students to form a team first and only later teams get a problem to work on. With this approach, you risk that students who are to work together do not like each other, which may affect forming a team and team co-operation later. You will also have to devote more time to the team-forming stage and help students create team atmosphere first and only later give them a problem to work on.

#### Approach D

Language proficiency as a way to form teams should be applied only if the language level (low or high) of some students does not allow for them to work together with the rest of the class. You appoint students and organize teams according to the language level of individual students. Apply this approach only exceptionally. It is much better to have mixed-ability teams and assign easier tasks to weaker students. Since it is you who have formed teams according to the students' language level it might also be you who will be responsible for poor team results at the end of the learning process.

No matter which approach is applied, students should be encouraged to socialize and to get to know more about each others' interests (exchange addresses, e-mails, telephone numbers). The problem-based learning process is more manageable if the team members are in constant contact.

### 1.3.2 Team size

The size of a team depends on the scope of their project. Five members is ideal but the group may have just 4.

Small or big groups are difficult to manage and may also be less coherent. No team spirit can be developed within small groups. Our experience shows that small groups (3 members or less) tend to work individually rather than in teams.

Large teams (6 members or more) are difficult to manage by a chairperson and secretary. Calling meetings becomes difficult and the progress is difficult to chase. This affects the assessment phase later (see: PBL ASSESSMENT, p.52).

### 1.3.3 Roles in a team

The roles in the team are: Chairperson, Secretary, Time-keeper/Progress-chaser, Reporter, Designer/Investigator, Editor/Evaluator.

#### LIST OF POSSIBLE ROLES IN A GROUP

**Chairperson:** chairs meetings, clarifies the aims of the meeting, the agenda, summarises discussions and decisions, organises, distributes tasks, clarifies aims, directs work, calls meetings.

**Secretary:** takes minutes of the meetings, keeps record of who is doing what, keeps project documentation in order.

**Time-keeper/Progress-chaser:** keeps time of the meetings, takes care that the group does not digress from the topics, sees that everyone is doing what he or she is supposed to do and that all the jobs are done on time.

**Reporter:** acts as the group's spokesman, is responsible for contacts with the teacher, other groups, informants, reports about progress in the project to the rest of the group at the start of each meeting.

**Designer and/or Investigator:** designs action plans, finds the relevant sources, brings information to the team, sees that important data are shared by all the members of the group.

**Editor:** shapes written reports, transparencies and other documents.

**Evaluator:** makes judgments about the group's problem-solving and decision-making activities, organisational problems, interpersonal relationships, group's outputs; checks the mistakes, anticipates possible criticism.

It is not necessary to appoint all the roles at the initial stage, as it may become easier to define them when the team starts working on the project. According to the team size you may decide upon three basic roles (chairperson, secretary, reporter), however, in

bigger teams it is useful to appoint other roles like timekeeper, investigator, etc. What is important is that the workload is evenly distributed among the members of the team.

It is possible to apply a rotation principle (roles are changed for each team meeting) or keep the same roles for the same students. You should decide upon this before the problem-based learning process after considering the advantages and disadvantages. Rotating presidency, for example, may enhance better distribution of responsibilities and leadership. Different members may at various times act as chairpersons of the group. The students who perform the same roles all the time identify with them quite soon but do not experience other roles within a team.

To identify students' preferences and their special skills that may be useful for the team, see: Checklist for determining roles in a team, p.71.

### **1.3.4 Time**

The team-forming stage does not necessarily take much time. Time spent on team building depends on the approach you choose, activities you are going to design and your pre-experience. Approaches **A**, **B** and **D** are not demanding considering the time spent in the classroom. Your role is to help and coordinate those students who cannot find enough partners to work on 'their' favourite problem. These students will have to make compromises in order to form groups at the very beginning of the problem-based learning process.

You can plan different amounts of time for problem-based learning, from one month to the whole semester. More time for projects gives you more opportunities for the input on different topics that students need during the problem-based learning process (e.g., team building exercises).

Creating a positive working atmosphere within the team takes a longer time. The second meeting usually shows to which extent and how well the tasks from the first meeting have been realized by the team members and how much team spirit is likely to develop.

### **1.3.5 Instructions**

- Design interesting problems (see: Problem design, p.8; more problems than teams or the same number as teams).
- Invite students to choose a problem they would like to work on.
- Assign a problem to each team.
- Formally establish the teams.
- Define how long the problem-based learning process will take and how long they will work as a team.
- Prepare team members for the roles according to their personal characteristics and preferences.

### **1.3.6 How to build team spirit**

It may be easy to form a group and control it but building team spirit within teams takes time and sincere effort from all involved. Group dynamic processes are very complex and require certain time to develop. After identifying special skills, team members need opportunities and experiences to practise and develop them within the team. This is

especially important when it comes to sharing responsibilities, conflicts and negotiating situations. It may happen that no group dynamic develops within a team and the task is performed in the absence of team spirit. Teach your students how they can contribute to team spirit and remember that you as a teacher are not included in the team and will not be able to control the processes within it.

Remember that:

- The students should keep the atmosphere comfortable and relaxed but serious.
- Friendly relations and the spirit of a common goal should be encouraged.
- The decisions should be made collectively. There should be consensus as to where the group is going.
- Members of the team should learn to listen to each other and be open to other members' suggestions.
- Tell students that conflicts are not unusual in teams. Differences of opinion should not be suppressed but the reasons should be carefully examined and a solution should be negotiated. Criticism of the problem or the group's operation should be open and frank, but never personal.
- Each member should develop his/her full potential. Even the quiet, the less confident, the slow and the less committed members should be encouraged to contribute their share, and to meet the agreed deadlines. A feeling of shared responsibility and workload is essential for good relations between team members.
- Students should identify the strengths and weaknesses of the team and work toward the improvement of weaknesses.
- Individual team members should discover how they can contribute best to the team performance.
- You are only an observer and a consultant, not a member of the team. You help by observing the process, and endeavour to develop problem-solving and collaborative skills.

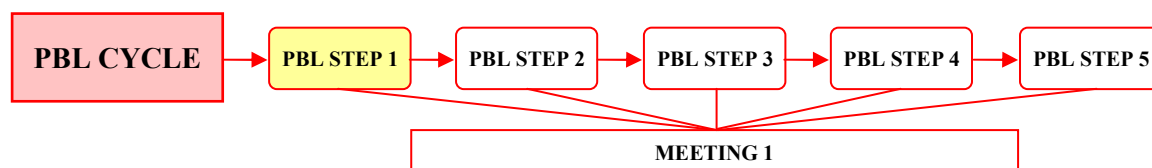
It is normal practice in any project to have an agreement between team members (see: Sample agreement, p.72).

## 2. PBL CYCLE

This chapter will guide you through the 7-PBL-Step model that represents the basis of the problem-based learning project research and that begins in the language classroom after problems have been designed and teams formed.

### 2.1 PBL Step 1: Making the problem clear

*Melita Djurić*



#### 2.1.1 Introduction

The first group meeting covers PBL Steps 1-5 and takes approximately 120 minutes. Before PBL Step 1 the students need input on writing the minutes to be able to follow the meeting and to record the discussion (see: Minutes, p.41).

Teams have already been formed and perhaps some roles already appointed to the members. Whether the teams have already received their problems to work on or they are given them at the beginning of PBL Step 1 depends on the approach you have applied for team forming (see: Team building, p.12). Students should be informed again that they are going to work on the problem for a certain period of time during their problem-based learning sessions (1 to 3 months).

The outcomes of PBL Step 1 are:

- identifying the problem and
- appointing the roles to the team members.

Identifying the problem is the stage when all members of the team understand the problem and agree it is a problem. You monitor the groups and help clarify anything in the problem description that students do not understand. Students are encouraged to communicate always in the target language. If they find that they do need their mother tongue, they are asked to note when this happens as the basis for later language follow-up.

Discussion involving identification of the problem helps in the process of deciding who should be Chairperson and who should be Secretary. Other roles may be appointed later through the discussion in the following steps or perhaps not at all, depending on your decision.



### 2.1.2 Time

The recommended time for making the problem clear is approximately 15 minutes. Within this time students would also decide upon two or more roles they will play in the team.

### 2.1.3 Instructions

For a successful completion of PBL Step 1:

- Make sure that teams have been formed.
- Check the number of students in teams (4-5).
- Make sure the students have the input on writing the minutes.
- Check whether the teams have a problem they would like to work on.
- Check whether the problems are clear to the teams – if the students have identified them as problems.
- Ask team members whether they are clear about their roles.

### 2.1.4 Sample document

Below you can find an extract from sample minutes written during the first meeting, referring to PBL Step 1 (see: p.11 for the problem referred to).

Minutes of the 1<sup>st</sup> meeting of the PBL group

Present: Alenka, Jože, Vesna, Dragan

Apologies for absence: /

Agenda:

1. Problem selection
2. Distribution of roles
3. Subject teacher selection

Ad.1.

We selected problem no. 7: Adria Airways – EasyJet: What Can the National Carrier Do?

Ad.2.

For the first meeting we determined the following roles: Alenka – chairperson, Jože – secretary, Vesna – timekeeper, Dragan – reporter.

Ad.3.

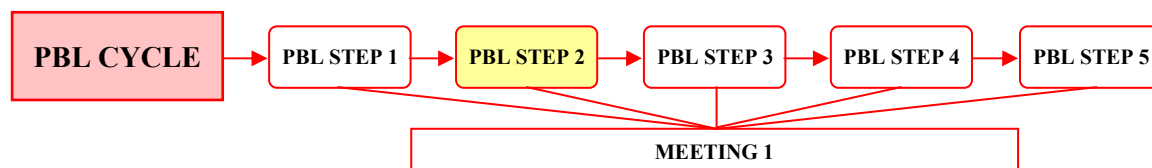
We decided to contact the aviation expert at our school for his help and expert opinion.

### 2.1.5 Language input

If your students do not have previous experience with meetings, the language input recommended at this stage refers to the language of meetings.

## 2.2 PBL Step 2: Formulating questions and queries

Šarolta Godnič Vičič



### 2.2.1 Introduction

Formulating questions and queries has a single aim: defining the problem in greater depth. This will allow students to understand what the problem really involves. Based on this deeper understanding they will be able to identify their learning needs and plan the learning process in the following stages of the problem-based learning process.

### 2.2.2 Time

Recommended time: from 15 to 30 minutes depending on the approach.

### 2.2.3 Instructions

The students' approach to defining the problem in detail will depend as much on their profiles (level of language proficiency, year of study, subject proficiency, etc.) as on the complexity of the problem they are dealing with. Thus, to students in their first year of study and at the intermediate to upper-intermediate level of foreign language proficiency you may want to suggest using a simpler approach where questions are formed in a brainstorming session. However, students with more discipline-related knowledge and/or at higher levels of foreign language proficiency may find more complex methods for breaking down their problem more suitable and rewarding.

#### Brainstorming

Ask your students to discuss their ideas about the problem in a brainstorming session and generate questions that will help them break down the problem into manageable parts. To ensure smooth work, make sure the group has appointed a secretary who will take down the ideas, and then go through the basic rules for brainstorming:

- ideas have to be generated spontaneously and quickly, and they should be as broad and odd as possible (brainstorming is a lateral thinking process that helps you break out of your thinking patterns into new ways of looking at things),
- students are not allowed to criticize the ideas as this cramps creativity,
- none of the ideas should be discussed too long,
- students should encourage each other and have fun.

Notice, however, that individuals risk humiliation in brainstorming activities, as ideas may seem stupid at first sight. Therefore you should monitor the groups well and make sure that no ideas are crushed and that students remain respectful of each other.

When students have generated about ten questions, they can review and discuss each of them critically. The five most relevant questions will serve as the basis for further work.

## Dealing with more complex problems

There are a number of tools that can help students gain a deeper understanding of complex problems. They may involve brainstorming as part of the process so students need to be familiar with it.

Students need to know of these tools and be able to use them before they start dealing with the problem-based learning problem. If you do the problem-based learning project towards the end of the course, you can teach your students how to use the individual tools during the initial parts of the course. If this is not the case, you will have to deal with these tools as an input in the introductory stage of the problem-based learning project. Please note that students may have already used some of the tools in other courses.

Tools that help dealing with complex problems are:

- appreciation (you keep asking the question “So what?” until you have learnt about all the possible implications of the problem),
- drill-down (drilling into problems helps you to break seemingly unmanageable problems down into manageable component parts),
- cause and effect (by focusing on the causes of a problem and their effects thoroughly you will be able to see more than just the obvious),
- system diagrams (they help you to understand how factors interact in complex situations and how a change in one factor may affect the process at a later stage),
- SWOT analysis (it will help you to focus on your Strengths, minimize Weaknesses, take the greatest possible advantage of Opportunities available, and identify Threats).

### 2.2.4 Sample document

Below you can find an extract from sample minutes written during the first meeting, referring to PBL Step 2.

Agenda:

4. Formulation of questions

Ad.4.

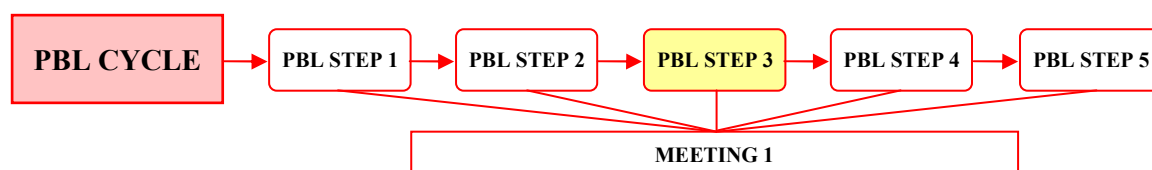
We formulated 12 questions related to the topic, which are:

- What are the prices between Ljubljana and London?
- Why is EasyJet cheaper and Adria Airways more expensive?
- What does EasyJet offer that Adria doesn't?
- Which airports does EasyJet fly to and which airports service Adria's planes?
- How many passengers did both airlines carry in recent years?
- What are the future plans of Adria?
- Which costs are higher for Adria?
- Which planes does each airline have?
- What do passengers with experience with both airlines think?
- What does Adria's management think about competition?
- Are there any other low-fare carriers in Europe?
- What's Adria's and EasyJet's history?
- What can Adria do to become/stay competitive and not lose their passengers?

We decided to keep all 12 questions and to select the 5 questions later.

## 2.3 PBL Step 3: Identifying current knowledge and learning needs

*Dubravka Celinšek*



### 2.3.1 Introduction

In PBL Step 2, students asked questions related to the problem, brainstormed, carried out a SWOT or other analysis in order to define the problem in greater depth as well as to develop a deeper understanding of it. Consequently, they will be able to identify their learning needs and plan the learning process in the next steps.

The purpose of PBL Step 3 is to identify the students' current knowledge of the selected problem and to share this knowledge among the team by trying to find answers to the questions from PBL Step 2. This knowledge should later form a basis for further study in the context of the given problem.

### 2.3.2 Time

It takes approximately 15 minutes for the students to identify their current knowledge.

### 2.3.3 Instructions

For a successful completion of PBL Step 3:

- encourage students to use their current knowledge and experience they have acquired during their studies or elsewhere,
- ask them to share this knowledge with the team, explaining or giving information orally,
- ask them to discuss or compare different answers to the same question and how they could be used in solving their problem,
- remind the secretary to record the gist of the suggested answers.

If students used a more complex approach during PBL Step 2, the diagrams will help them identify what they already know.

Already at this step students can think of where to look for the necessary information.

### 2.3.4 Sample document

Below you can find an extract from sample minutes written during the first meeting, referring to PBL Step 3.

Agenda:

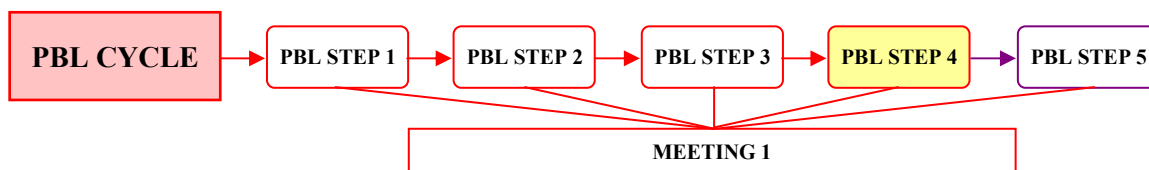
5. Identification of current knowledge and learning needs

Ad.5.

We talked about the topic and what information we have and what still needs to be researched. We found out that we have to find information on all aspects of our problem.

## 2.4 PBL Step 4: Structuring ideas

*Nada Vukadinović*



### 2.4.1 Introduction

Structuring ideas is a very important step in the process of problem-based learning. If students are unable to structure ideas and concepts, if the relationships between the ideas are not clear, this will be reflected in the end report. Therefore, it is worthwhile to devote a special session to this.

Making a schematic structure of a problem where the causes and effects and possible solutions to the problem are shown is a move away from PBL Steps 1, 2 and 3. While during PBL Steps 1, 2 and 3 students were required to brainstorm ideas, ask questions and identify their current knowledge and learning needs, at this stage they need to employ logical thinking, structure their knowledge, link the concepts, and based on these determine their future learning needs.

Our experience shows that students may have bright ideas about a certain problem, or know quite a lot about a topic but be unable to relate these, or structure the ideas so as to clearly see the cause and the effect of a problem.

Therefore, in PBL Step 4, team members need to sit together and bring out all the knowledge they have about a certain topic and try to structure it. The main goal is for them to link the concepts into a logical structural scheme. Graphic schemes in the form of concept (mind) maps can help everyone in the group understand the problem better, define the reasons for a certain problem and see what impacts the problem can have on life.

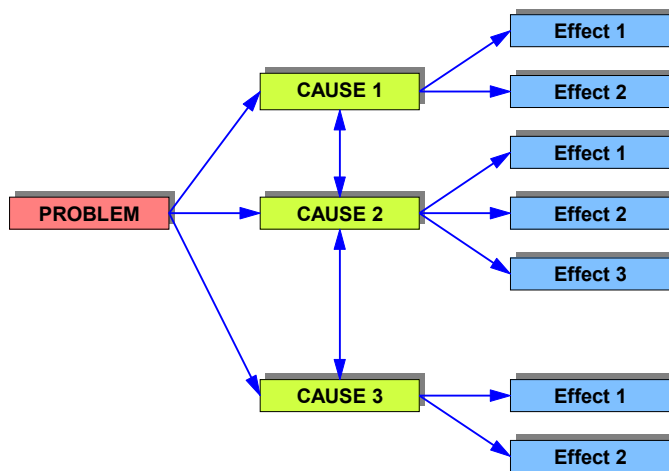
Why concept maps? Through visual presentation we can better understand the information and it is easier for our brain to extract thematic and coherent meaning. Once a graphic presentation of the problem has been made, the structure of the report will become clear as well. A graphic presentation will also make it easier for students to divide their future tasks and focus their further research.

### 2.4.2 Time

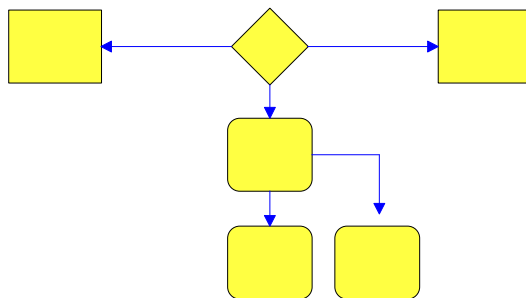
Approximately 30 minutes are suggested for building a concept map. Teacher input will be needed so as to show the students various types of concept maps and explain their purpose. The result should be that the students design a concept (mind) map of their own.

### 2.4.3 Procedure

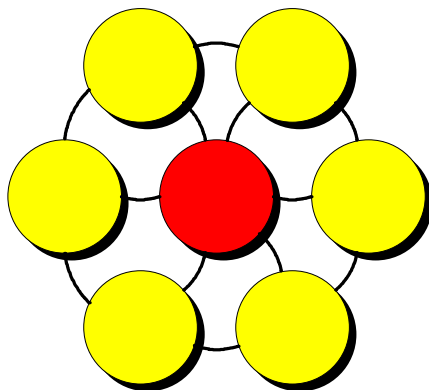
1) Explain and present various types of concept maps (see below):



Hierarchical map (allows for the division of the problem into levels and the highlighting of problem-effect relations)



Flow-chart (pictorial representation describing the process analysis; very useful when examining how various steps in the process work together)



Spider map (organises information by placing the central theme or the unifying concept in the centre, outwardly radiating sub-themes around the centre of the map). These may be further developed into mind maps.

2) Explain the five-step procedure for making a concept map:

- **Select**: Focus on a theme and then identify related key words or phrases.
- **Rank**: Rank the concepts (key words or phrases) from the most abstract and inclusive to the most concrete and specific.
- **Cluster**: Cluster concepts that function at similar levels of abstraction and those that interrelate closely.
- **Arrange**: Arrange concepts into a diagrammatic representation.
- **Link and label**: Link concepts with lines and label each line.

3) Let students think about their own problem and design their own concept map. Tell them that the purpose of designing a concept map is to help them understand the problem better. Once the map is made, the structure of the report will automatically emerge.

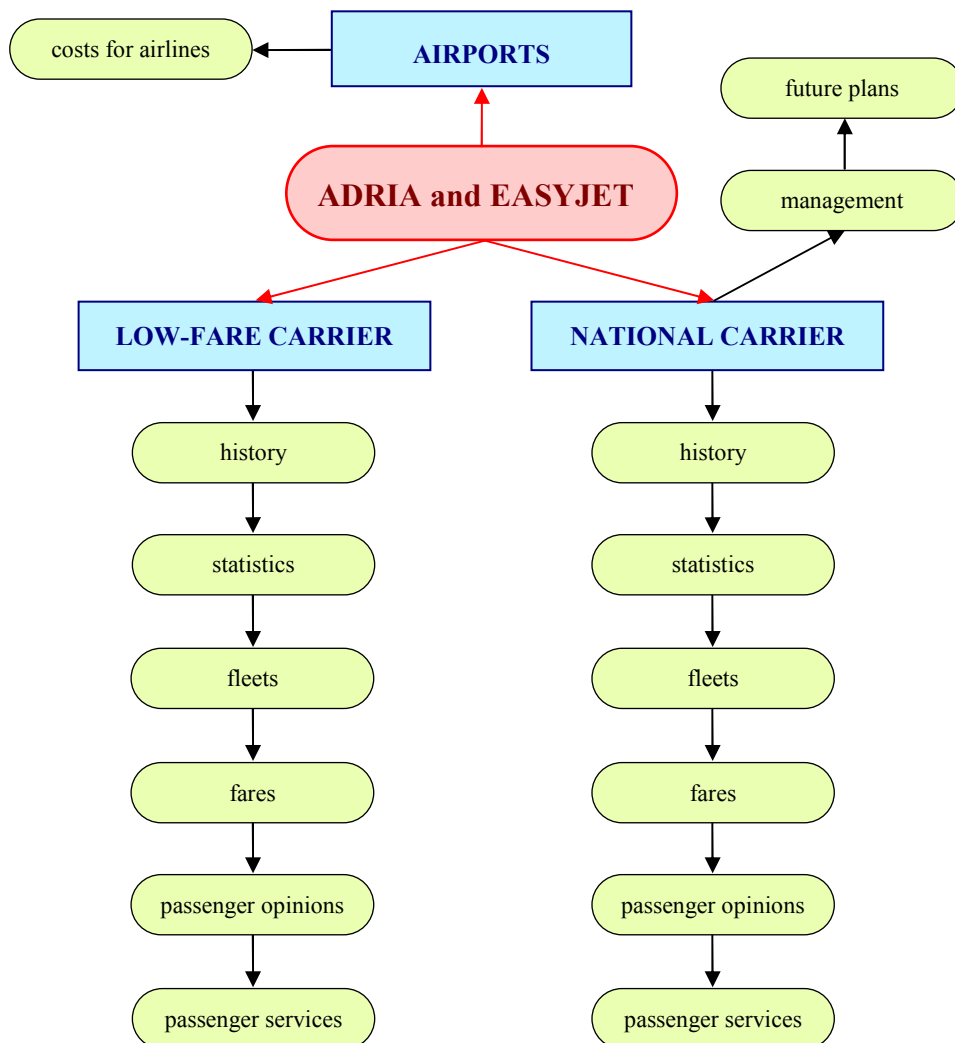
#### 2.4.4 Sample documents

Below you can find an extract from sample minutes written during the first meeting, referring to PBL Step 4.

Agenda:  
6. Grouping ideas

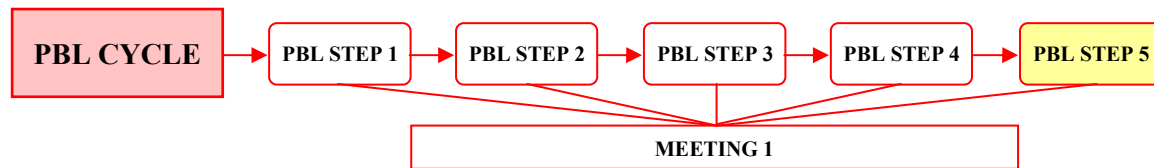
Ad.6.  
We grouped the ideas we got from the questions and created a spider map to make the ideas more clear.

The spider map produced by the students based on the twelve questions they formulated (see: Sample document, p.19) can be found below:



## 2.5 PBL Step 5: Formulating learning aims and distributing assignments

Mojca Jarc



### 2.5.1 Introduction

Once the problem has been structured and presented in a concept map, the students will find it easy to describe it in terms of learning aims and distribute the assignments among group members.

Firstly, students have to reconsider the questions and ideas from PBL Step 2 and the concept map from PBL Step 4. A clear formulation of the learning aims helps students to better understand their task. Therefore, they should be encouraged to participate in the description of goals expressed in units of knowledge, understanding and skills. Students should endeavour to formulate their learning aims as clearly and precisely as possible, using explicit verbs relating to these activities (e.g., evaluate, explain, analyse, define, identify, etc.).

Subsequently, the main goal will be broken down into smaller units. Students have to use *knowledge* for setting goals and subgoals.

To achieve the agreed upon goals students have to anticipate all the steps and the tasks facing the group. Each student is then assigned the task of searching for more information about a particular aspect of the problem. As a rule, students should work on the question they are most knowledgeable about. The secretary notes down the name of the student responsible for a particular issue. This is the safest way to avoid confusion and to make sure that each member understands what his/her duties are. Additionally, such a record will serve as a reminder of operational plans carried out by other members in the group.

The chairperson is assigned the task of coordinating the work during the research time, making sure nobody forgets to complete the assignment.

### 2.5.2 Time

Approximately 30 minutes will be needed for this stage.

### 2.5.3 Instructions

For a successful completion of PBL Step 5:

- Ask your students to reconsider the following questions:
  - What do we need to produce?
  - What do we need to learn in order to be able to produce such an outcome?
  - How are we expected to demonstrate the results of our research?
  - What kind of information do we need in order to carry out our task?



- Ask your students to make a list of their learning aims.
- Ask your students to translate the learning aims into an operational plan stating clearly who will do what. Make sure that complex tasks have been divided up into several parts or steps. Students should discuss the learning tasks individual members will have to tackle for the next session. The secretary should make a record of the division of tasks.

The task description should include the following elements:

WHAT?	The group should avoid giving too general assignments. Specific descriptions of tasks should be provided. A clear definition of the expected outcome will enhance the implementation of a task and will help the student to find a focus.
WHO?	The work should be divided among group members according to the following criteria: <ul style="list-style-type: none"> <li>- equal workload for all group members,</li> <li>- abilities of individual members to carry out the assigned tasks.</li> </ul>
HOW?	Determine the necessary resources the student will need in order to get the job done: e.g., reading a section of a textbook, doing a literature search, searching the internet, consulting an expert, etc.
DATE OF COMPLETION/ DATE OF REPORT	Time keeping is an important element of task performance. Determine the estimated time to accomplish the task. A rationale should be found between the overall deadlines and the time necessary for the completion of an individual task. Students are expected to report on their findings at the next meeting. It may sound compulsive, but action should be taken if a student fails to complete an assignment within the limits of the agreed deadline (e.g., he/she may be asked to explain why he/she did not carry out his/her task). Provide for emergencies (e.g., what happens if somebody falls ill, quits, etc.). Planning to have all the work done ahead of the deadline can give the group some extra time to develop contingency plans.
SIGNATURE	Each member has to accept his/her task and confirm that he/she is willing to carry it out.

### 2.5.4 Sample document

Below you can find an extract from sample minutes written during the first meeting, referring to PBL Step 5.

Agenda:

- 7. Learning aims
- 8. Distribution of tasks
- 9. Next meeting
- 10. AOB

Ad.7.

We defined what we have to learn for our project (see below).

Ad.8.

We divided the assignments: Alenka will research the history of both airlines and find out about other low-fare carriers in Europe. Jože will find statistical information about both airlines and research the fare that both airlines offer to their passengers. Vesna will research the costs of airlines. Dragan will contact a friend of his father who works at Adria and ask him for information on the costs charged to airlines.

Ad.9.

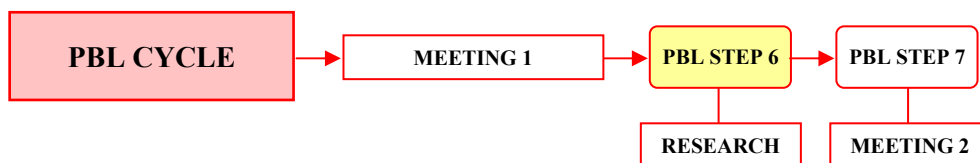
The next meeting is going to be held on 2<sup>nd</sup> December, 2003.

Ad.10.

We will open an internet forum to find out what experienced passengers think.

## 2.6 PBL Step 6: Out-of-class research

*Nada Vukadinović*



### 2.6.1 Introduction

After the problem has been structured and tasks divided, students can start their individual research. It is very important that tasks and responsibilities of individual members are always recorded in the minutes of project group meetings (see: Minutes, p.41).

You can expect that while looking for information students will first use the internet (see: Finding information, below); they will read books and journals but sooner or later they will need some specific guidance and come to seek help from their subject teachers as well. For this reason it is ideal if you can interest your colleagues in becoming part of problem-based learning projects. In an ideal LSP problem-based learning scheme, a subject teacher should be appointed to each project team and students should have a chance to contact him/her and ask for guidance (see: Contacting subject teachers, p.6).

Our own experience shows that students often feel too confident and very rarely ask for help during their research process, as if they wanted to prove that they can do everything by themselves. However, at the end, when they submit their draft report, and receive negative feedback, they do not know whom to blame.

You should make it clear that although problem-based learning is about independent and autonomous learning, you are there to help and direct the students. You should not intervene if it is not necessary. It happens very often that groups want to hide problems but are not aware that they may thus be jeopardizing the work on the project. At this stage of the project it may happen that a member of the group suddenly disappears, or does not contribute to the group as expected. There may even be drop-outs from groups after the tasks have already been distributed. This causes a lot of frustration in groups, students usually try to cover up or solve problems in their own way, not always successfully, and you may not even know what is going on. One way to avoid this is to ask the Reporters of each group to report to you about the progress and problems in the group. Make sure that you (and the subject teacher) are available during regular contact hours.

### 2.6.2 Finding information

To solve the problem, students will need to do a lot of out-of-class research, which corresponds to PBL Step 6.

#### Introduction

We can draw information from various sources, e.g., books, journals, encyclopaedias, conference reports, handbooks, theses. Valuable sources of information can also be

experts in the field, subject teachers, and fellow students, but the main and the most popular source of information remains the internet.

We are in fact surrounded by a sea of various information sources but when we dive into this sea, are we going to catch the fish that we want? Considering that there are about three billion web pages on the internet, the problem is how to get the right fish.

Very often students will come and say that they do not get any information on the internet. This is a result of wrong strategies in information search.

We want our students to become digitally literate as well, which means that they should become able to find information, determine its usefulness and accuracy, and use it effectively.

Information search strategies are transferable skills. The improvement of digital literacy is a task of all teachers involved in the educational process. Since you can expect that students will mainly use the internet for their research, problem-based learning offers a wonderful opportunity for the students to learn how to use the internet and exploit the potentials of the search engines for drawing out useful information.

### **Time**

Approximately 45 minutes have proved enough for teaching the internet skills.

### **Instructions**

The best possibility is teaching by doing it, having a computer room available. If not, your demonstration on a computer with a screen display will do.

### **Search engines**

To teach your students how to use the internet you need to make them aware of the different search engines (*Google, Altavista, Lycos, Yahoo, etc.*) and the system of using key words. Let students select any key word related to their research or discipline, test it with different search engines, and observe how the hits are displayed in each. Students should observe and notice the difference for themselves.

According to some research, *Google* remains the most popular search engine for any academic research so you may advise the students to try this first.

### **Defining key words**

If your target keyword is wrong all your search efforts will be in vain. Therefore, students need to define proper key words.

You may give your students any description of a problem and ask them to define the key words, as for example in the following sample problem:

**EVERYTHING MUST GO SOMEWHERE**

Municipal solid waste is a big problem for all communities. Where does all our waste go?

There are mainly three methods for solving this problem:

- (a) reducing the amount of waste generated,
- (b) disposing waste in landfills,
- (c) incinerating waste.

Find out what these methods mean and point out advantages and disadvantages of each.

Students will probably come up with the following key words:

*Waste            Municipal    Solid            Reducing    Landfill        Incinerating*

Let them type these words into the *Google* window and see what they get. They will realise that they got too many hits for each concept and that the concepts are not related. The next step is to demonstrate how to relate these concepts into phrases and how to narrow the search down.

**Making phrases**

For narrowing down a search use a simple experiment to see how making phrases by using quotation marks works. Let the students type in the following word sets to see what they get and make them aware that they can narrow down the number of hits if they make phrases by using quotation marks:

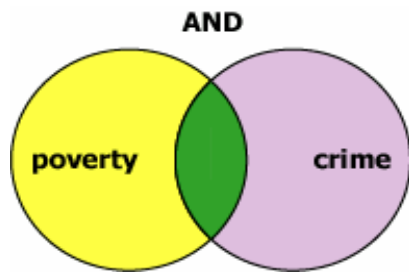
Waste	13,800,000 hits
“Solid waste”	1,860,000 hits
“Municipal solid waste”	138,000 hits

A phrase (words typed within quotation marks) can significantly narrow down and focus a search but we can further narrow the number of hits down if we use the Boolean operators.

**Boolean operators for narrowing down a search**

Most browsers use the Boolean operators, which establish logical relationships among the words.

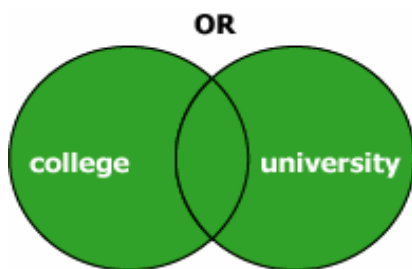
Here are some examples your students can try for themselves. Suppose they are looking for documents on poverty related to crime (see: Scheme 1, p.30). They can see for themselves how the number of hits changes when using Boolean operators.



poverty ♦ AND ♦ crime  
or  
poverty ♦ + crime

Scheme 1: Boolean operator ‘AND’. The search engine will look only for documents that mention poverty related to crime.

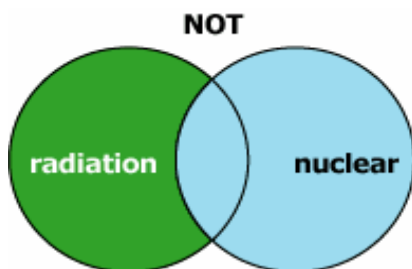
**Search terms results:**  
poverty 783,447  
crime 2,962,165  
poverty AND crime 1,677



college ♦ OR ♦ university

Scheme 2: Boolean operator OR, used when there are synonyms for a concept (e.g., waste/refuse, hazard/danger, etc.)

**Search terms results:**  
college 17,320,770  
university 33,685,205  
college OR university 33,702,660



radiation ♦ NOT ♦ nuclear

Scheme 3: Boolean operator NOT used when we need to exclude a specific term from our search (e.g., any radiation but not nuclear).

**Search terms results:**  
radiation 7,690,000  
nuclear 15,500,000  
radiation NOT nuclear 1,110,000

[Note: The ♦ sign in the example indicates that there should be a blank space between the words when you type them.]

Now students can try narrowing down their search on the example of municipal solid waste and various waste management methods by setting the following profiles using search phrases and the Boolean operator AND:

“Municipal solid waste” AND landfill	46,400 hits
“Municipal solid waste” AND incineration	17,200 hits
“Municipal solid waste” AND reduction	42,000 hits

The examples above show that the engine searched only for specific documents related to municipal solid waste related to a further specific method of treatment (landfill, incineration or reduction). Thus we got a more ‘manageable’ number of documents for further research.

### **Looking at the internet critically**

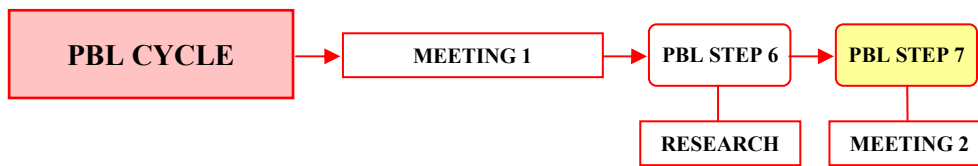
Another important aspect of using the internet effectively is how to look at it critically. Not all documents that we find are valuable. Our students sometimes find it difficult to decide which documents are really relevant for their research and which are not. You need to point out that they should not stop at the first document they get but rather do a lot of checking and sifting of documents before deciding which is relevant.

The relevance of documents can be examined by evaluating them, applying the following criteria:

- purpose (why was the web page created? to inform, to sell, to provoke? is it technical, scholarly, popular, elementary?),
- authorship (are the names of the author and institution provided?),
- accuracy (is the information credible?),
- timeliness (is the document dated, is the website regularly updated?),
- coverage (is the page complete or still under construction?).

## 2.7 PBL Step 7: Discussing and evaluating new information

*Nada Vukadinović*



### 2.7.1 Introduction

The main objective of PBL Step 7 is that students share and evaluate the information they have learnt so far, ask themselves if this information is relevant enough to defend their case, and decide if further research is needed before proceeding to the reporting stage. This phase takes place at the second project group meeting. The main purposes are that the students identify what they have learnt and what they do not know yet, and that they are engaged in the exchange of information.

### 2.7.2 Time

This step will take approximately 45 minutes.

### 2.7.3 Detailed instructions as to what to do

Too often our students seem to be satisfied with the first piece of information they get, which results in gathering irrelevant information. To avoid this, you must monitor work in such a way as to ask students how satisfied they are with the information and possibly guide them to better sources or back to earlier steps in the problem-based learning process.

### 2.7.4 Sample document

Below you can find a sample minutes written during the second meeting referring to the sample problem on p.11 and PBL Step 7.



Minutes of the 2nd meeting of the PBL group, held on 2nd December, 2003

Present: Alenka, Jože, Vesna, Dragan

Apologies for absence: /

Agenda:

1. Distribution of roles
2. Analysing information about EasyJet and Ryanair
3. Formulation of questions for an interview with Brnik
4. Distribution of assignments
5. Next meeting
6. AOB

Ad.1.

We decided on the following roles: Alenka – chairperson, Jože – secretary, Vesna – reporter, Dragan – timekeeper.

Ad.2.

We agreed that we have enough information about Adria Airways but not about Easyjet.

Ad.3.

We put together several questions to present to Adria Airways mostly concerning EasyJet's coming to Slovenia with the purpose to get more useful information.

Ad.4.

We decided that Dragan will talk to his friend again. The rest of us will try to find more information on the internet.

Ad.5.

The next meeting is going to be held on 18<sup>th</sup> December, 2003, at 2 p.m.

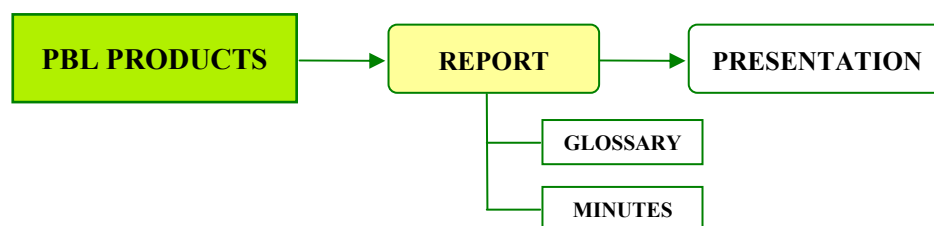
Ad.6. /

## 3. PBL PRODUCTS

In this chapter you will find information on the products of the problem-based learning process: the report and presentation as well as appendices attached to each report, i.e., the glossary and the minutes taken during student meetings (other documents that may be attached are the concept maps, summaries of readings, and draft reports).

### 3.1 Report

*Šarolta Godnič Vičič*



#### 3.1.1 Introduction

The report is one of the key products of the problem-based learning process. Report writing, on the other hand, is a process that gives your students not only an opportunity to improve their writing skills, but also to experience collaborative writing as a social process and develop strategies for dealing with it. Report writing also gives you, the teacher, perhaps the biggest opportunity in the whole problem-based learning process for language input, i.e., it gives you an opportunity to adjust your teaching to what your students need most.

You need to plan the writing process with great care. Determine first your students' learning needs as regards their writing skills and then your teaching aims for the problem-based learning report writing process. This will allow you to calculate the time dedicated to it and prepare any additional materials your students may need.

The problem-based learning report officially documents the team's response to the problem. It is written by the team after they have studied the problem carefully and responded to it. However, it is more than that: it is evidence of the team's hard work, especially in terms of creativity, overcoming conflict and coordinating activities in order to come to a shared understanding. Keep all this in mind when you set your writing assessment criteria (see: Report assessment, p. 54). Remember, students must know these criteria before they start writing the report.

Students will learn more from the process if you offer them feedback on their draft reports. This feedback should not include only the correction of mistakes. Students need you to explain how they can improve their report overall and discuss possible writing problems with them.

The report writing process also gives you an opportunity to teach your students how to use a concordancer. Using it regularly will allow your students to interact with texts actively and analytically and to explore word forms, usage, vocabulary, collocation, grammatical features, syntax, and stylistics. As a result, students will become much

more autonomous as learners of English. However, do not introduce this tool until you are comfortable with it yourself.

### **3.1.2 Time**

Recommended time for teaching how to write a report is from 2 to 4 weeks, depending on students' writing experience, amount of language input and your teaching aims. Remember, students always run out of time no matter what time brackets you give them. Therefore, the deadlines for handing in the draft report and the final version of the report must be clearly set.

### **3.1.3 Instructions**

#### **Premises**

Make sure students have extra time during this stage of the process for meetings and research.

#### **Collaborative writing strategies**

As collaborative writing requires a great deal of communication between team members, the group needs to agree on a coordination strategy before writing can begin.

Ideally, the team plans and outlines the report structure and contents together and then assigns individual sections to team members. After each team member has written his/her part of the report, somebody puts the parts together and makes sure everybody gets a copy of this first draft. After reading it, the team meets and discusses the issues arising from it. Report revising is thus a group activity. Checking grammar and spelling, though, can be assigned to a single team member.

However, there are also other coordination practices used in working environments. Which of these are still acceptable in the problem-based learning process is up to you to determine. Let's have a quick look at some of the options:

- one member of the team plans and writes a draft, the group revises it,
- the team plans and outlines the writing task, then one member prepares the draft, the team revises it,
- one student plans and outlines the writing task and then assigns the tasks, team members complete their individual tasks, one student compiles and revises the report.

Teams tend to develop their own coordination strategies and build them on past experiences and trust among members. Whatever the strategy, they all have one thing in common: a bad plan leads to disastrous results.

#### **Report planning**

When writing a report, the answers to the following questions must be clear to the group:

- Why are you writing the report?  
The purpose of the problem-based learning report is to inform the reader(s) of the problem the group dealt with and the solution the group suggests. Students of higher

language and professional proficiency may also try to persuade the reader that their solution is optimal.

- Who will read the report?  
Probably you and the subject teacher. The audience has to be defined as this allows students to address their audience appropriately and adjust their language to meet the readers' needs. This is an aspect of writing that many students have difficulties with.
- What will the report cover?  
The scope of the report, i.e., what information will be included and what left out, depends on why the report is written and on the needs and expectations of the audience.
- How will this be conveyed?  
The information presented in the report needs to have a logical structure and it has to be presented in a manner that will be easy to read and pleasing to the eye (language, figures, tables, length, medium, etc.).
- When and where is the report required?

### **Report writing**

The following components are present in almost all reports: title page, summary, table of contents, body of the report, list of references, and appendices. You may also decide to ask students to add a glossary at the end of the report. Remember, you have to define each of these parts and give your students detailed instruction regarding what these should be like.

Reports tend to be structured according to the following problem/solution pattern:

- **situation** (what was the situation?),
- **goal/opportunity/gap in the knowledge** (what goal did you want to achieve? what opportunity arose for you within this situation? what gap in your knowledge arose within this situation?),
- **basis for your response** (what are the reasons for developing your reaction and argument? what is the theoretical background to the problem?),
- **your response** (what method did you use to achieve your goal? what did you do to take the opportunity? what did you do to fill this gap in knowledge?),
- **evaluation of your response** (how successful was your response to the situation?).

This organization pattern will help your students construct an outline for their report. Remind them to use the notes and mind maps that group members made during their learning process. Once they have determined the major topics in each of these sections, they can break them down into sections and write paragraphs.

Their report can also follow the IMRAD (Introduction-Methodology-Research-Analysis-Discussion) pattern.

## **Report editing**

Every report needs careful editing if it is to achieve its aims. Once the text is written, students should check:

### **FORMAT**

attractive and reader-friendly,  
consistent style (headlines, text, bullets,  
spacing),  
- page numbering.

### **CONTENT**

clearly stated purpose,  
organized logically (easy to follow),  
complete and fully developed,  
statements supported by evidence, facts or  
examples,  
- text addresses reader's needs and  
concerns.

### **LANGUAGE**

grammar,  
precise vocabulary,  
clear sentences,  
positive and friendly tone.

### **MECHANICS**

correct punctuation,  
correct spelling.

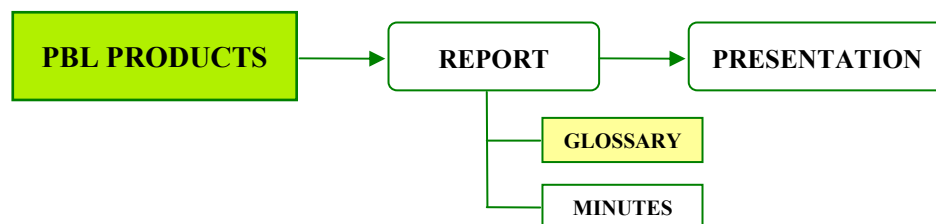
To encourage autonomous learning, you may consider the introduction of correction codes, which will enable your students to identify their mistakes and try to correct them themselves (see: Correction codes, p.73). Another teaching aid that you can use is a report feedback form (see: Report feedback form, p.74)

### **3.1.4 Language input**

Again, the report writing process offers you an opportunity to focus on your students' productive language skills. Depending on their needs, you may decide to pay attention to the structure of the report, coherence and cohesion, addressing the audience, paraphrasing, summarizing, quoting and reporting other writers' works, writing abstracts, defining key sentences, transition between paragraphs, complex sentence structures, register, appropriate word choice, word order in sentences, etc.

## 3.2 Glossary

Mojca Jarc



### 3.2.1 Introduction

A glossary is an important but optional part of the report. The aims of the glossary are to:

- develop your students’ retrieval skills,
- develop the key terminology of the topic/field their group is researching,
- develop the knowledge of mother tongue equivalents and definitions of the terms used in the report.

Most of your students have probably produced vocabulary lists in a foreign language but they never tried building glossaries of terms. Two skills involved in glossary compilation are:

- identification of terminological units and
- description of terminological units.

In order to develop these two skills, you should first tell your students *where* and *how* to search for terms.

Specialized texts differ according to the target audience. We distinguish between expert-expert communication, expert-initiates communication and language used in popularised texts. While potential terms are likely to be found in the first two types of texts, popularised texts are less reliable sources for term identification and description.

Students can rely on their conceptual knowledge when searching for terms. However, it may help to know what terms usually look like when they appear in specialised texts. In different languages there are different patterns of term formation, but in general it can be claimed that compounds (multiword terms) are quite common in LSP (consider strings such as: *weapons - nuclear weapons - tactical nuclear weapons; missile – ballistic missile – sea-launched ballistic missile*).

Secondly, you will have to explain how terminological units can be described; in other words, you will determine the structure of the glossary.

Here several factors have to be taken into account:

- students’ language level,
- students’ subject competence,
- students’ learning aims,
- potential use of the glossary for other users.

Students at a low foreign language level cannot be expected to produce more than word lists of key terminology. Students with a reasonable foreign-language competence and with a relatively low subject competence on the other hand, are more likely to recognize terminological units and to search for the definitions, as well as to observe the use of the vocabulary in context. Students who speak more than one foreign language can even be encouraged to produce multilingual glossaries.

The forms of the glossary are therefore liable to range from simple, alphabetically arranged word lists to more complex descriptions of terminological units, including more or less detailed linguistic and encyclopaedic information.

### 3.2.6 Instructions

#### Phase 1: Identifying terminological units

Explain and present some key characteristics of specialized texts:

- reference to a specific subject field,
- use of specialised terms,
- existence of rules to guide the structure of information.

Discuss the differences between general language vocabulary and terminology:

- general language vocabulary is more often polysemic,
- terms are more often compounds,
- terms are subject to more or less strict definitions within a subject field.

Give your students a sample paragraph from an abstract of a specialized article, preferably in the field they are expected to study in the problem-based learning process and ask them to underline the terminological units in the text.

#### Phase 2: Description of terminological units

Ask your students to produce a glossary of the underlined terminological units.

Encourage them to use specialised dictionaries, encyclopaedias, and on-line dictionaries and glossaries (e.g., [www.onelook.com](http://www.onelook.com)) for the description of term use and for definitions of the terms.

### 3.2.7 Sample glossary

Example of a blank record sheet with legend:

ENG: English entry	FRA: Equivalent in French	SLO: Equivalent in Slovene
GRA: grammatical class FIE: field of notion DEF: definition CON: context of use SOU: source of the term COM: syntactic combination, collocation		

Example of entries from a glossary of terms compiled within a PBL project on “Human rights violations in Liberia”:

ENG: human rights	FRA: droits de l’homme	SLO: človekove pravice
<p>GRA: n          FIE: political science          DEF: a set of inalienable rights belonging to all humans according to natural law          CON: Liberian government forces and rebel fighters are committing grave human rights abuses while peacekeeping forces remain inadequate.          SOU: Human Rights Watch: Liberia: Un: Action Needed to End Rights Abuses (<a href="http://www.hrw.org/press/2003/09/liberia091603.htm">http://www.hrw.org/press/2003/09/liberia091603.htm</a>) last accessed: November 2003.          COM: human rights abuse</p>		

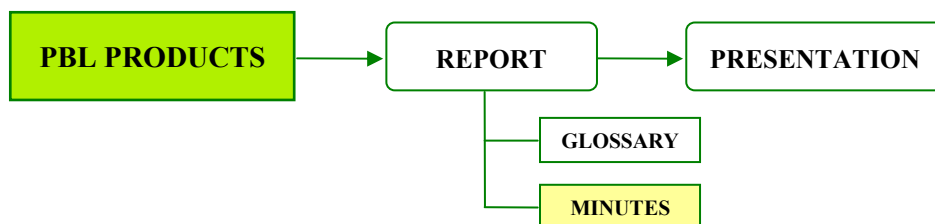
ENG: peacekeeping force	FRA: force de paix	SLO: mirovna sila
<p>GRA: n          FIE: political science          DEF: troops deployed in operations designed to restore or protect the peace in certain areas of conflict          CON: The United Nations Security Council today authorized a peacekeeping force to Liberia.          SOU: Human Rights Watch: Libera: Peacekeepers Should not be Shielded from Justice. (<a href="http://www.hrw/2003/08/libera080103.htm">http://www.hrw/2003/08/libera080103.htm</a>) last accessed: November 2003.          COM: UN peacekeeping force</p>		

ENG: Security Council	FRA: Conseil de Sécurité	SLO: Varnostni svet
<p>GRA: n          FIE: political science          DEF: an organ of the United Nations organisation; it is charged with maintenance of international peace and security between nations; it consists of five permanent and ten non-permanent members          CON: The United Nations Security Council today authorized a peacekeeping force to Liberia.          SOU: Human Rights Watch: Libera: Peacekeepers Should not be Shielded from Justice. (<a href="http://www.hrw./2003/08/libera080103.htm">http://www.hrw./2003/08/libera080103.htm</a>) last accessed: November 2003.</p>		



### 3.3 Minutes

Dubravka Celinšek



#### 3.3.1 Introduction

The meetings students hold during the problem-based learning process (see: PBL CYCLE, p.16) are recorded in the minutes, an official record of what happened during the meeting.

One of the aims in problem-based learning is for the students to be able to write the minutes of meetings, which is a skill they should study before or during the problem-based learning process. Everybody should be able to take the minutes. Hence, team members should take turns as secretaries.

The minutes are a valuable resource for you and your students in the problem-based learning process. They:

- enable team members to recall or check what was discussed, suggested and solved in a meeting, who was involved in the discussion, what responsibilities were allocated for implementing certain actions and to whom, if they carried out what was decided and completed their tasks in due time, took proper actions, progressed with their task, etc.,
- can be used as a reliable source of information, suggestions and ideas to be used later in the report,
- record team members' participation in meetings, which is useful information for team members in peer and self-assessment, as well as for you when monitoring and assessing the process (see: Process assessment, p.60).

#### 3.3.2 Time

Pre-teaching how to write the minutes will take approximately 60 minutes.

#### 3.3.3 Instructions

Before each meeting, students prepare an *agenda* – a plan containing items to be discussed in the meeting.

They should be aware that the agenda makes their meetings better organized and will be used later in writing the minutes of their meeting.

Ask your students:

- what information should be included in the minutes,
- how to organize this information, and

- to try to write their own agendas.

Suggest that they:

- find various agenda samples on the internet, and
- compare the items included, or provide them with a sample agenda so they can compare their agendas with the sample and decide what information to add and what structure to adopt.

The agenda for their first meeting should be organized according to the 5 PBL steps, so that they deal with all important matters in a logical order. This also provides the structure of the minutes.

For the second in-class meeting the team members prepare an agenda that should include their research and the final step. The secretary is responsible for circulating the agenda to all team members before the meeting. For the second meeting the agenda should also include:

- approving the minutes of the first meeting, and
- matters arising/action-item follow-up.

Various styles of minutes are:

### **1) Summary minutes**

The structure of headings and numbering appear as it is in the agenda, however, the order of information (a sentence or a paragraph) within each agenda item is at the discretion of the secretary who summarizes the discussion as a whole without going into too much detail. They are more focused on the subject than on the individuals. They are the most popular as they are short, easy to take and quicker to read.

### **2) Verbatim minutes ('she said', 'he said' type)**

This style of minutes records and follows the path of the discussion or takes the order in which various aspects are raised and outlined, and then groups the information in that order. Verbatim minutes are usually long, summarizing individuals' views. Names are often given; however, they can be replaced with phrases such as 'it was stated that' or 'we heard that', etc.

### **3) Action minutes**

They consist of the agenda and the outcome of each discussion given after the headings. However, they provide no view of how a decision was reached. They are suitable where only a reminder is required.

During the problem-based learning process any of these styles can be used. Action minutes may be a part of verbatim or summary minutes or they may be useful for out-of-the-class meetings when task attribution is the essential aim of the meeting.

Generally speaking, their minutes should be attributive, which means that they identify who said what, so the names of team members are put down next to their ideas, suggestions, etc. The same ideas may sometimes be attributed to more than one team member as sometimes it is difficult to decide whom to attribute the idea to as other team members may have adopted it at the very beginning or have had similar ideas.

The function of a chairperson should be a rotating function so that all team members have a chance to practice this role. However, this depends on the number of meetings and the length of the problem-based learning process.

The chairperson is the one who runs the meeting. Therefore, he:

- is responsible for starting the meeting on time,
- states the objectives,
- refers to the agenda,
- introduces the first speaker,
- prevents interruptions,
- summarises,
- asks for comments, and
- closes the meeting.

A good chairperson makes it easier for the secretary to follow the discussion and take notes, and makes sure all team members, also the secretary, take an active part in the discussion.

The function of a secretary is usually also rotational so that all team members have the opportunity to experience how to take the minutes. Usually there are more than two meetings as students also meet outside the class, so there should be enough opportunities for all of them. The secretary puts down the main points under each item. He/she should make sure that everybody can see the notes. Therefore, there should be flip charts or computers provided for each team. The secretary should keep the records organized, putting down the:

- title of the meeting,
- date and time,
- venue,
- attendees/team members (present/absent/apologies for absence),
- agenda and the notes under each agenda item,
- any other business (AOB),
- date of next meeting, and
- close of meeting.

To facilitate note-taking, the secretary should:

- prepare a template with the agenda, leaving space for notes, or
- put down key words only and expand them into the minutes immediately after the meeting, and
- prepare a list of reporting verbs used in writing the minutes, which could be pre-taught or assigned to students as homework (compiling the lists and comparing them in the class).

While writing the minutes, the secretary pays special attention to getting the gist of the discussion, recording what is decided, what tasks are to be completed, by whom and when.

Finalizing the minutes should be team work; each member should be involved in this process, checking the sections for possible restructuring, extending and finalizing their notes into the final version of the minutes, striving to word minutes objectively, using short sentences. Nevertheless, due to time constraints team members can decide to allocate this task to the secretary.

### 3.3.4 Sample document

Below you can find the complete sample minutes referring to PBL Steps 1-5.

Minutes of the 1<sup>st</sup> meeting of the PBL group, held on 15<sup>th</sup> November, 2003

Present: Alenka, Jože, Vesna, Dragan

Apologies for absence: /

Agenda:

- 1) Problem selection
- 2) Distribution of roles
- 3) Subject teacher selection
- 4) Formulation of questions
- 5) Identification of current knowledge
- 6) Grouping ideas
- 7) Learning aims
- 8) Distribution of tasks
- 9) Next meeting
- 10) AOB

Ad.1.

We selected problem no. 7: Adria Airways – EasyJet: What Can the National Carrier Do?

Ad.2.

For the first meeting we decided on the following roles: Alenka – chairperson, Jože – secretary, Vesna – timekeeper, Dragan – reporter.

Ad.3.

We decided to contact the aviation expert at our school for his/her help and expert opinion.

Ad.4.

We formulated 12 questions related to the topic, which are:

- What are the prices between Ljubljana and London?
- Why is EasyJet cheaper and Adria Airways more expensive?
- What does EasyJet offer that Adria doesn't?
- Which airports does EasyJet fly to and which airports service Adria's planes?
- How many passengers did both airlines carry in the last years?
- What are the future plans of Adria?
- Which costs are higher for Adria?
- Which planes does each airline have?
- What do passengers with experience with both airlines think?
- What does Adria's management think about competition?
- Are there any other low-fare carriers in Europe?
- What's Adria's and EasyJet's history?
- What can Adria do to become/stay competitive and not lose their passengers?

We decided to keep all 12 questions and to select the 5 questions later.

Ad.5.

We talked about the topic and what information we have and what still needs to be researched.

Ad.6.

We grouped the ideas we got from the questions and created a spider chart to make the ideas more clear.

Ad.7.

We defined what we have to learn for our project (see below).

Ad.8.

We divided the assignments: Alenka will research the history of both airlines and find about other low-fare carriers in Europe. Jože will find statistical information about both airlines and research the fare that both airlines offer to their passengers. Vesna will research the costs of airlines. Dragan will contact a friend of his/her father who works at Adria and ask him for information.

Ad.9.

The next meeting is going to be held on 2<sup>nd</sup> December, 2003.

Ad.10.

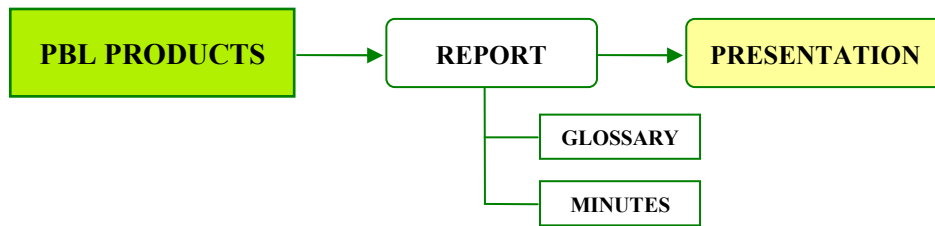
We will open an internet forum to find out what experienced passengers think.

Chair:

Secretary:

## 3.4 Presentation

*Mojca Jarc*



### 3.4.1 Introduction

In the problem-based learning cycle students are required to produce two outputs: a written report (see: Report, p. 34) and an oral presentation. A successful presentation and delivery are therefore essential elements of the process.

The overall objective of an oral presentation is to prepare the students for effective spoken communication in professional settings. In order to deliver well-designed, interesting and effective presentations, they will have to develop a mixture of skills:

- organization skills,
- verbal communication skills,
- non-verbal communication skills,
- skills to deal with stage fright.

Ideally, *all* group members should be involved in the preparation and in the delivery of the oral presentation. This allows for no improvisation. Badly prepared group presentations are invariably boring and disorganised. In order to avoid unstructured presentations quite a lot of co-ordination among group members is needed.

Apart from the organisation skills, students need to develop strategies to express their ideas and to formulate the results of a problem in oral discourse.

Moreover, you should not forget that the psychological factor considerably affects the final outcome of the presentation. Many students describe public speaking in front of an audience as their number one anxiety-causing experience. However, most of the students will consider the opportunity to present the results of their research to be a challenge and the peak of the whole problem-based learning process.

Before asking your students to prepare a team presentation of their problem-based learning project, you need to evaluate their knowledge, skills, and presentation practice. Building on the existing skills, you can develop a framework for active, critical and reflective learning. The oral presentation has to be described as a structured discourse, which can only be fully understood and developed when clearly digested in four subsequent stages:

- planning,
- preparation,
- practicing,
- presentation.

The quality of the output will depend on the quality of each of the stages.

Assessment criteria should be explained to the students (see: Presentation assessment, p. 57) before they start designing their presentation.

### **3.4.2 Time**

Recommended time for classroom activities is 4-6 hours. Depending on the students' previous experience in delivering presentations you should count from 2 to 4 teaching hours for instructions and for the language input. An additional 2 hours can be spent on the mock presentation session.

### **3.4.3 Aspects of presentations**

The process of presentation reveals a certain number of critical points that seem to appear not only in the problem-based learning experience, but also in a more general manner throughout the different situations of oral presentation:

- material aspects and
- presentation skills.

#### **Material Aspects**

Different presentation settings in terms of audiences, time, space, and facilities demand careful planning. You and the presenters should share the responsibility for the optimal material environment.

Make a schedule of the oral presentations, counting approximately 20 minutes per group presentation, followed by some extra time for questions from the audience and for discussion.

Groups will be allotted a certain amount of time for their presentations and there should be a clear plan including information on:

- how many presentations per lesson you can have,
- what to do if unexpected modifications of the initial plan occur (e.g., what happens if a member of a group or even a whole group does not show up; what if a presentation takes more time than expected, etc.).

Check the size of the room, the number of chairs, and potential distractions.

Inform your students about the available accessories, especially the audio-visual equipment and instruct them to check available accessories.

#### **Presentation Skills**

In order to develop your students' presentation skills you need to assess their existing competences. This will enable you to identify the potential trouble areas in order to target students' learning needs and your teaching aims.

It is assumed that your students will need to receive coaching in terms of language skills, non-verbal communication skills and organisation skills.

To assess your students' presentation skills:

- ask your students to make a short group presentation on a familiar topic,
- video-tape their performance,
- after the presentations, encourage your students to speak about this experience,
- analyse their performance and identify their learning needs.

Before the presentation stage, each group has prepared a written report on their findings. While preparing the presentation some groups may be inclined to copy-paste their written reports and to use them for the oral presentation. That is one reason to emphasise the difference between written and oral reports.

Show your students examples of good practices in oral presentations. You can use available course materials on presentations. Alternatively, you might find it useful to show recordings of student-prepared presentations from previous years.

Draw their attention to the following language skills:

- formulating effective introductions and conclusions,
- recognizing differences between written and oral discourse (complexity, sentence length, personalizing),
- asking and answering questions,
- structuring ideas and signposting.

In terms of non-verbal communication skills two issues have to be addressed to enhance students' non-verbal communication skills: stress and body language.

To discuss how to handle stress:

- talk about students' previous experience with stress and stage fright, present some of the techniques that can be used in order to minimize negative stress effects.

To discuss how to use appropriate body language:

- explain that people are likely to trust non-verbal signs more than verbal messages.

### **Organization skills**

You should explain that:

- a successful preparation of a presentation is a time-consuming process, therefore students should start preparing early,
- the approaches to oral and to written presentation differ greatly, therefore the oral presentation requires reorganisation of the material.

Guide your students through the four presentation stages. Depending on their skills and previous experience with presentations, they will need more or less detailed explanation.

### *Planning*

Explain and present the need to reflect on the following elements:

Audience analysis	Who are they? Why are they here? What are their interests? What do they know about the specific PBL subject? What do they want to know? What do they expect to hear? What are their hidden agendas?
Purpose of the presentation	To inform? To persuade? To teach? To train? To sell?
Presentation outline	What is your thesis statement? Which are the main points of your speech? What are the most effective patterns for organizing your speech logically in order to adapt it to the audience and to the purpose?  The problem/solution pattern is probably the most suitable principle to follow. According to this pattern the outline will include: <ul style="list-style-type: none"><li>- introduction</li><li>- statement of problem</li><li>- analysis of the situation</li><li>- description of the solution(s)</li><li>- conclusion (see also Report writing: p. 34)</li></ul>

### *Preparation*

Present the key features and functions of the presentation structure.

### *Practicing*

- Explain the importance of practicing. This is also the moment when some final changes of the presentation may be introduced.
- Ask your students to prepare a mock presentation on a given topic.
- Make sure that the students have distributed parts of the presentation among group members. Remind them to choose a group member who will be responsible for coordinating different parts of the presentation. Since it is very difficult and time consuming to control this activity, you can ask students to practice before a group of colleagues or friends.
- Encourage your students to receive feedback on their presentation. Ask the audience to use a simplified checklist for the presentations (see: Mock presentation checklist, p.75).
- Ask the students to identify one or more aspects of this presentation that they would change.
- Analyse video-recorded presentations and offer constructive criticism.
- Distribute and explain the assessment criteria you are going to use for the presentations (see: Presentation assessment, p.57).



Having learned various presentation techniques and methods, your students can start applying this knowledge to the problem-based learning context.

### **3.4.4 Effective visuals**

*Nada Vukadinović*

#### **Introduction**

Good speakers who can attract the audience simply by the way they are speaking are very rare and we all know that speaking to an audience requires a good measure of self-confidence, a good voice and speaking talent. In addition to that, a lot of people suffer from audience phobia, which may sometimes be so severe that the speaker, when feeling that all the eyes from the audience are focused on him, will be totally blocked. The speaker using no visual support is all the time in focus, the main visual so to say, which only increases stage fright.

It goes without saying that no presentation should be made without visual support and there are several factors that support this statement:

- good visuals will support the speaker and improve the speaker's confidence. Speakers who use visuals are more persuasive,
- people will remember more. Visual memory is stronger than auditory memory. According to some research on types of memory, 40% people have visual memory, 45% kinaesthetic and only 15% auditory memory,
- people remember 50% of what they read and only 10% of what they hear,
- listeners can only listen 25 – 50% of time,
- visuals reinforce the message and increase attention, comprehension and retention of information,
- visuals have a stimulating effect,
- good key-wording supports the talk and can solve the problem of a speaker's bad accent or articulation.

When we use visuals during a presentation, the conveyed information goes through two channels (visual and auditory), which means that we can achieve greater synergism between the left and the right parts of the brain and thus achieve a holistic effect.

It can be said that good visuals will speak for themselves. In our experience, poor presenters using visuals can be as effective as good presenters not using visuals.

Another argument for visuals is also that when our students speak in a foreign language, they need to concentrate on the language and while they are concentrating on the language they cannot concentrate on the facts, and vice versa; if they are concentrating on the facts, they may lose control over their language.

Thus, you should require students to prepare a presentation with visual support, which can be either in the form of transparencies for overhead projectors, or computer presentation, using PowerPoint.

You should encourage your students to use PowerPoint for the following reasons:

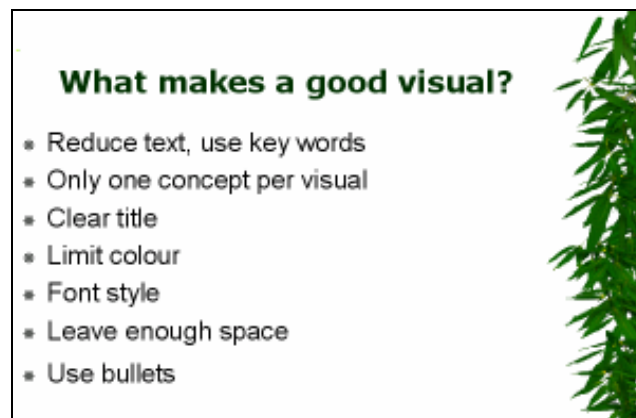
- it is very easy to learn the program,

- computer slides look more professional,
- students can play with various colour designs, import pictures, videos and sound and include all sorts of effects for textual presentation,
- it is cheaper than buying transparencies,
- it is easy to make corrections and changes.

The principles of designing good slides could be summarised into these points:

- **Reduce text** to the minimum. Use key words and follow the number 7 principle, which means that on one slide there should not be more than seven lines and each line should not have more than seven words.
- **Only one concept per visual**: use separate slides if you have two or more different concepts to present.
- **Clear title**: each visual should have a clear title at the top.
- **Limit colour**: use no more than four colours per slide, otherwise you will achieve a distracting peacock effect.
- **Font style**: do not use more than two font styles per visual, preferably only one throughout the presentation.
- **Leave enough free space**: do not overcrowd the slide with information, there should be 30% free space around the message on the slide.
- **Use bullets** for enumerating, not numbers, unless you want to emphasise that the number of points is important.

A visual is a wonderful support and prevents the speaker from losing the thread of speech. Key words will always remind the speaker of what to say next.



As for designing principles, the following tips may be helpful in preparing a slide:

- use contrasting colours (e.g., light colours of text on dark background, or the other way around),
- letter colours to avoid (red and green combination because it looks very aggressive),
- font size (24 - 32),
- font style (Arial, Verdana, Times New Roman),
- no italics,
- use lower case.

PowerPoint offers numerous possibilities for importing other media: sound and picture, or video. In addition to that you can use various effects for text animation.

Our experience shows that students, especially those who have just learned the PowerPoint program, are tempted to apply all sorts of effects (e.g., crawling, boomerang, zoom-in, zoom-out) and will even use all sorts of sounds (e.g., bells, horns, type-writer). Overuse of such effects can be very distracting and even annoying. You should tell them to use these effects sparingly and try the presentation before they deliver it to the audience.

There is one more thing that the audience will detect immediately: spelling mistakes. Fortunately, PowerPoint has a spell checker and you must insist that students use it. There should be no excuses later for any mistakes in the text.

**Time required**

Approximately 20-30 minutes have proved enough for teaching how to design a good visual.

## 4. PBL ASSESSMENT

*Bernarda Kosel*

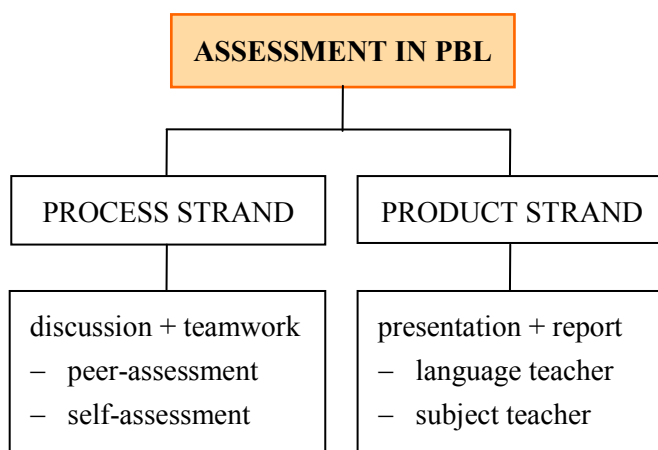
In this chapter you will find information on assessment in problem-based learning: report, presentation and process assessment. In the conclusion you will also find an assessment formula for calculating the final grade for problem-based learning.

### 4.1 Assessment framework for problem-based learning

Problem-based learning is a typical example of an educational model in which it does not suffice to assess the products of learning only. You also need to get some information on what was going on during the learning process itself. For this reason assessment should be divided into two strands:

- the product strand and
- the process strand.

In the product strand, the products assessed would be the written report and the oral presentation, while in the process strand assessment would be focused on the quality of students' involvement in the learning process in terms of their contribution to the learning process and personal improvement.



This decision to divide the assessment into the product and process strands is also supported by the latest trends in assessment theory. Today, teachers need to develop a new way of thinking about assessment. It should no longer be regarded solely as a means of measuring the results (products) but should also act as an aid to the learning process. Assessment is undergoing a shift from standardized testing and written examination to a broader model of educational assessment from which the teacher and the student should receive formative feedback information. Therefore, today assessment should not be something that is 'tacked on' to the learning process at the end, but should also take place during the process of learning.

#### 4.1.1 People involved in problem-based learning assessment

In a problem-based learning situation you are not really able to observe all that is going on within student-centred groups during the learning process. You may be in the best

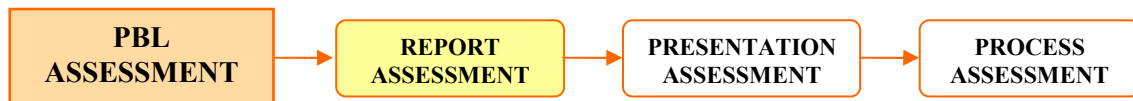
position to judge the products, but when the quality of the process is to be judged, your students may be in a better position to do the job. Consequently the products (presentation and report) should be assessed by teachers and the learning process should be assessed by students only.

In a standard situation, the assessment of the quality of presentations and reports should not be a problem for you. In problem-based learning, however, because of the cross-curricular dimension, the assessment done by you alone would not do. It is necessary to achieve at least some cooperation from the subject teacher in assessment. Ideally, the work in assessing the quality of products should be split between the language teacher and the subject teacher. The latter would assess whether the topic is well-researched and whether relevant and insightful information is offered, and you would assess the language aspect. Members of the professionally-oriented community would judge students' work differently from you. They would judge language errors less severely or would not notice them. This of course is only natural. They will look at the features such as well-researched content, relevant solutions, and the like. Concerning the fluency versus accuracy criterion, they will consider fluency to be much more important.

In some of our problem-based learning settings, subject teachers cooperated only on a voluntary basis, not as part of their regular workload and timetable, so it was not fair to expect that they would spend a great deal of time assessing problem-based learning work. In these cases, they would only be asked to assess the report and were not at the presentation, and the language teacher assessed the oral presentation more as a linguistic product.

It is also possible to involve *peers* in the assessment of the product for a mark. However, be careful because our experience shows that our first year undergraduates have not yet acquired the maturity nor the necessary skills to be able to assess for a final mark. Nevertheless, what you can do is to involve peers in assessing parts of the presentation and first drafts of reports *for formative purposes*. Peers prove to be good judges of how good the presentation was in terms of organization, if the use of visuals aids is good, if the body language is appropriate, and so on. In addition, exchanging their individual contributions to the written report and telling each other their opinions brings fruitful results. Suggestions for possible improvements made by peers are taken to heart even more than those made by the teacher. There are also benefits for the assessing peers, as it helps them improve their own written and spoken performance.

## 4.2 Report assessment



The report (see: Report, p.34) is one of the key outcomes of the problem-based learning process, which is why its assessment should be carefully planned, and students should be acquainted with the criteria before they start writing it.

Ideally, the work should be split between the subject teacher and you. The subject teacher would assess whether the topic is well-researched and whether relevant and insightful information is offered, and you would assess the language aspect. Peers, too, could be included in the assessment of the report. However, this depends on their maturity and responsibility. If students are not mature enough to assess one another for the final grade, you can ask them to read and correct their peers' first draft of the report for formative purposes.

### 4.2.1 Report assessment criteria

Further on you will find two examples of rating scales for reports. The difference between them is that the first one – *Report Assessment Form* – is designed for situations in which the report is the product of the whole group and they all get the same mark for the report, whereas the second – *Rating Scale for Group Report* – is designed for situations when each individual student is responsible for his/her own part of the report and is marked for it only.

In both, the first part is intended to assess whether the solution to the problem is relevant and correct and whether the report contains insightful information. It is desirable that this section be judged by the subject teacher who can best say whether the topic was well-researched and whether the solutions offered are based on factual data and literature.

Another important criterion is the report structure (see: Report, p.34).

If each student is writing his/her own part, then an important element is how the student was able to plan and complete his/her own part and incorporate it into the whole. This criterion should be included in the rating scale because it shows how well individual team members were able to integrate their contributions into the whole, and how well they know the work of other team members. This of course requires insight into the whole topic and a high level of cooperation.

A set of criteria should also exist for assessing whether the standard of English was acceptable. The report or an individual part of the report is judged in terms of appropriate vocabulary, grammar and spelling and other writing skills such as use of linking words, paragraph building, and paraphrasing and summarizing. In the report the assessor should give greater emphasis to grammatical accuracy, whereas in the presentation more emphasis should be given to fluency.

An important criterion is meeting the standards of writing manageable by your students. This criterion is focused on how well the report meets the requirements of the genre and the standards of report writing such as citation conventions, referencing and bibliography standards, and observation of copyright restrictions.

Below is a sample of a report rating scale used for the situation where the group members decide to share the mark for the report.

<b>Report Assessment Form</b>					
Subject teacher					
Project title: _____					
Please evaluate the following group achievements:					
<b>SUBJECT TEACHER</b>					
	1	2	3	4	5
Quality of work:					
- the work is well focused	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- the solutions are as expected (correct)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- problem coverage complete	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- literary sources well utilised	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The documentation is:					
- logically structured	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- complete (contains all elements of a report)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Technical vocabulary appropriate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Have the group contacted you for help?	YES	<input type="checkbox"/>	NO	<input type="checkbox"/>	
POINTS	_____				/35 = ...%
<b>LANGUAGE TEACHER</b>					
	1	2	3	4	5
Standard of English:					
Use of info (rephrasing, summarizing, discarding irrelevant information)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Referencing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Style (corresponds to the standards of report writing, use of cohesive devices)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Grammar (word order, tense forms, subject-verb agreement)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Appropriate vocabulary	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spelling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Paragraphing and punctuation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Structure and layout	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
POINTS	_____				/40 = .....%

Designed by Vukadinović, N.

And here is a sample of a report rating scale for the situation where the part written by a particular student is identifiable, and each student gets his/her own mark for the report.

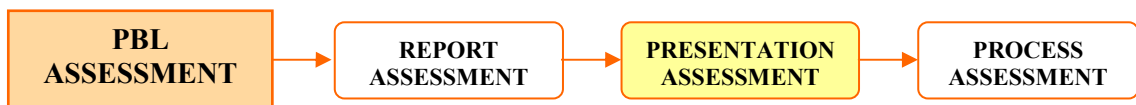
### Rating Scale for Group Report

Please assess the report by giving a grade from 1 – 5 (1 = not at all, 5 = very much so) in each of the following categories:

Student's name				
Contains relevant, insightful information, the solution offered is based on factual data (preferably assessed by subject teacher).				
Demonstrates awareness of structure (either Problem/Solution or IMRAD pattern).				
Shows ability to plan and complete own elements of written team report.				
Standard of English acceptable, appropriate word order, appropriate vocabulary, spelling correct.				
Meets the standards of academic writing, uses referencing, citation conventions broadly observed.				



## 4.3 Presentation assessment



Ideally, in the assessment of the presentation you would have three parties involved: you, the subject teacher and the peers. If subject teachers are not at the presentation they can only assess the report and leave the presentation to you to be assessed as a language product only.

Certain elements in the presentation may well be judged by peers. Before the presentation peers are given the presentation assessment forms and they are asked to assess each presenter in terms of organization, the use of visual aids, body language and the like. Suggestions for possible improvements made by peers are taken to heart even more than if they were made by you. In addition, there are also benefits for the assessing peers. It helps them improve their own spoken performance.

### 4.3.1 Presentation assessment criteria

Further on you will find two possible assessment forms for the presentation.

The first element in the assessment form should of course be *relevance of content*, which is preferably assessed by the subject teacher.

The second and the third elements are: *clear and well-structured organization supported by visuals* and *delivery style*. They refer to assessing the presenters in terms of how clear and well-organized they were, whether the use of visuals was good, their body language was appropriate, whether questions were invited and answered, and so on. If the students are mature enough, all these elements can best be judged by peers since they are actually the audience. Being required to assess their colleague's presentation is at the same time an awareness-building tool for possible weaknesses in their own presentations. If the presentation is given for the first time, the feedback information the presenting students will get from their peers can be very useful for the next presentation.

The last element in the presentation rating scale refers to the *performance in the foreign language*. The presenter is judged in terms of pronunciation of words and sounds, appropriate vocabulary, use of discourse markers, and grammatical accuracy. However, concerning the latter, priority should be given to fluency since this is more important in spoken production. The assessor of this element in the rating scale is of course you.

### Rating Scale for Oral Presentation

Please assess the student (your colleague) by giving a grade from 1 – 5 (1 = not at all; 5 = very much so) where indicated.

Student's name				
The topic is relevant, well researched and content appropriate. <i>(subject teacher)</i>				
Clear and well-structured organization, supported by visuals. <i>(peers)</i>				
Excellent delivery, appropriate body language, can invite questions and answer them successfully. <i>(peers)</i>				
Good clear pronunciation, fluent with little hesitation, appropriate vocabulary, use of discourse markers. <i>(language teacher)</i>				

## Presentation Assessment Form

Name of speaker: \_\_\_\_\_  
 Member of team: \_\_\_\_\_

### PREPARATION AND CONTENT

#### Topic

- well researched, interesting, informative	5	4	3	2	1
- relevant to the audience and local environment	5	4	3	2	1

#### Organisation

- clear structure	5	4	3	2	1
- good use of 'signpost' words	5	4	3	2	1
- good supporting statements	5	4	3	2	1
- enough examples, details	5	4	3	2	1

### PRESENTATION STYLE

#### Delivery

- good use of eye contact/body language	5	4	3	2	1
- voice - audible and varied tone	5	4	3	2	1
- good use of notes (not read)	5	4	3	2	1

#### Use of Overhead Transparencies/Slides

- OHP/LCD used effectively	5	4	3	2	1
- OHP/slides well prepared	5	4	3	2	1
- visual aid(s) relevant/appropriate and easy to read	5	4	3	2	1
- language on slides correct	5	4	3	2	1

### LANGUAGE

- appropriate to audience and topic	5	4	3	2	1
- grammar accurate	5	4	3	2	1
- pronunciation clear	5	4	3	2	1
- qs from the audience effectively dealt with	5	4	3	2	1

Start time: \_\_\_\_\_

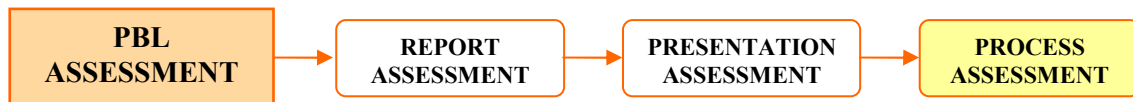
Total: \_\_\_\_\_

Finish time: \_\_\_\_\_

Timing penalties (optional)

*Designed by: Vukadinović, N.*

## 4.4 Process assessment



Turning to the process strand, it is less clear which tools of assessment would be best to use. Self-assessment is an additional tool for reaching beyond traditional testing and widening the perspectives of both teachers and students. The students become more aware of the aspects of the learning process and the teachers get feedback for possible modifications or adjustments to the process.

If you decide to use self-assessment for the process, then probably the best idea is to design a *self-assessment questionnaire* that would best suit the situation in which you are teaching. Most of our students prove to be quite realistic judges of their own performance. A self-assessment questionnaire asking them whether they have been successful might clarify why something went wrong, and might also serve as a motivational tool for the future.

A model of a *self-assessment questionnaire* is shown here asking students to assess their own study/research skills, thinking skills, language ability, and group work skills. The scale ranges from *not yet, with difficulty*, to *with ease*. Therefore, the students have the opportunity to judge their own skills and ability in a range that communicates to them that in the learning process they can continuously improve.

In the first section of the questionnaire there are a number of judgment statements referring to study and research skills where students have to judge how far they have developed as independent learners and how good they are at planning their learning (developing students into independent learners is one of the goals of problem-based learning).

The next section in the questionnaire focuses on foreign language performance. The abilities that are pointed out here are taken from the Common European Framework (CEF) for level ‘B1 – B2’ – Independent User. Students are made familiar with the levels in CEF at the beginning of the course and recognize the level ‘B1 - B2’ as their aim. These are especially the ability to understand professional written information in English, the ability to pass on detailed information reliably, give a clear presentation, and write a report.

Finally, since problem-based learning is carried out in student-centred groups and its success largely depends on successful teamwork, the last question aims at raising the student’s awareness of the skills necessary for that.

At the end they are asked to comment on their own progress in learning and the way they learn, which raises their awareness of what is going on in the learning process.

The list of judgment statements in the questionnaire could of course be much longer. However, we tried to keep it short, since students soon lose their interest if questionnaires become too long.

### Self-Assessment Checklist

Please answer how you were able to cope with all the different tasks required in problem-based learning. Tick either not yet, with difficulty, with ease.

Situation	I can do this		
	Not yet	With difficulty	With ease
<b>Study/research skills</b> I can access all the facilities available for finding information.			
I can integrate information from a number of different sources.			
I can plan my own learning to address the problem.			
I can judge what I know and what I still don't know.			
<b>Language skills (CEF B2)</b> I can obtain information, ideas and opinions from highly specialized sources within my field.			
I can understand and exchange complex information related to my field of interest.			
I can write a report on a topic related to my field of interest.			
I can give a clear presentation with appropriate highlighting and relevant details.			
<b>Group work skills</b> I have acquired skills necessary to work in the group.			

What can I do now that I couldn't do before?

---

Do I think working in a problem-based learning group has changed my way of learning English?

---

Problem-based learning is a process in which group work is a major component; hence, you will also need a tool to assess how much an individual student contributed to successful teamwork. For this purpose, you can introduce a *confidential peer-assessment checklist* in which students of the same group are asked to assess their peers in terms of their contribution to the group: regular, active collaboration, commitment to the common goal, readiness to share knowledge, etc. All these qualities are very important, since problem-based learning cannot function properly without them, while if they are present the learning process will unfold by itself. This tool should be made known to students at the beginning of the cycle or by the latest at the second meeting. Learning that they will have to assess one another acts as a catalyst to the learning process and actually gets the lazy students working.

The *peer assessment checklist* should be confidential. It serves as evidence for the distribution of the points by the group themselves. The student with the most points gathered in this checklist should also get the highest number of points for contribution to group work.

### Peer-Assessment Checklist

Please assess the other members of your group by giving a grade:

- 3 – better than most of the group
- 2 – about average for this group
- 1 – not as good as most of the group
- 0 – no help at all
- 1 – hindrance to the group

Write in your colleagues' names				
Attended meetings regularly, accepted fair share of work and completed by the required time.				
Contributed to the group discussions, helped to identify the key issues of the problem and made meaningful contributions to the group discussions.				
Positive attitude to the group, encourager, supporter of team decisions.				
Has researched the topic well, the quality of his/her contribution.				

*Designed by Kosel, B.*

## 4.5 Arriving at the final mark

Arriving at the final grade is a little more complicated because we are dealing with three problems:

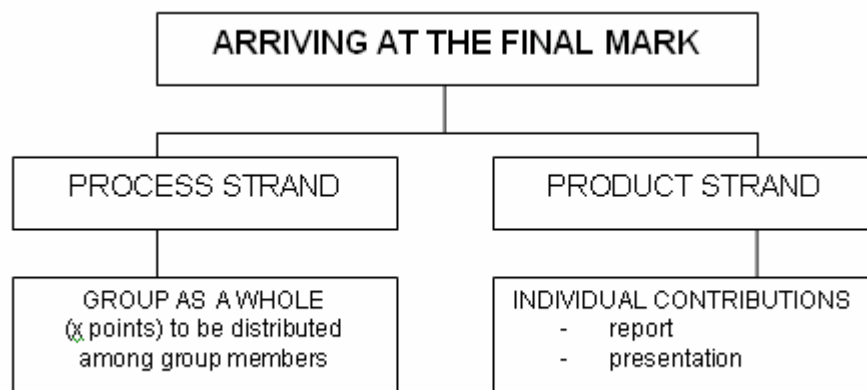
- how to identify the contribution of an individual in the group,
- how to calculate the final grade if we are dealing with so many elements that need to be assessed (linguistic side of the report, content of the report, presentation, additional materials, etc.),
- how to integrate teacher assessment with peer-assessment and self-assessment.

Here are two situations we would like to present to demonstrate the methodology for calculating the final grade:

### Situation 1

The problem-based learning cycle can be organised so that it is possible to identify the contributions of each individual student in the report, i.e., the report may show the names of the authors under each chapter. If you are assessing only the language aspect (subject teachers are either not involved, or will consider the content of the report in the final mark for the specialist subject), it is easy for you to grade the report. Use the Group Report Rating Scale shown on page 56. It should not be difficult to assess the performance of individuals during presentations. You may use Presentation Assessment Forms on pages 58 or 59, whichever better applies to your situation. In this case you may simply add the two grades.

However, you will very probably feel that some elements from the learning process strand should be included in the final mark as well. In the literature there are a number of suggestions for this. For example, you can give the whole group 50 points to be distributed among them depending on how much each student contributed to the whole. If there are five students in the group, each student can get a maximum of 10 points but may get less. Not all points need be distributed. For example, a student who was a hindrance to the group should not get all the points, or even none at all. Here members of the group can rely on the peer assessment questionnaire. These points can then be added to the points earned in the product strand (report plus presentation):



## Situation 2

In another situation you may have a report which was the result of a joint effort and you cannot clearly identify the contributions of individuals. Also, you may want to include the grade given by the subject teacher for the content part of the report and also add the grade for the additional materials.

In this situation you will first need to decide the shares of each element in the total. Here is a suggestion:

<b>Element</b>	<b>Share</b>
Language part of the report	30%
Content part of the report	20%
Presentation	25%
Additional materials	25%

However, this still does not solve the question of the contribution of an individual in the group. In this case peer assessment forms become crucial. Peer assessment is strictly confidential. You may use the Peer Assessment Checklist shown on page 62. Ask the students to hand them to you after they have submitted the project and after presentations. You need to analyse the grades the members of the group have given one another. Very often students will grade each other equally, which is an indication that the group was coherent and that each one made an equal contribution to the success of the project. However, if you see that there are discrepancies, and that one or two members were graded much differently, you need to call the whole group and tell them to fairly decide who in this case would deserve a higher grade and who deserves a lower.



## 5. FREQUENTLY ASKED QUESTIONS

In this subchapter you will find a selection of frequently asked questions with possible solutions. Because each problem-based situation is highly specific, the list can by no means be exhaustive. Nevertheless, we sincerely hope that you will find some answers to your questions in this section. The questions and answers are divided into four sections, following the four main chapters of the *Guide to Problem-Based Learning*.

### 5.1 PBL pre-steps

#### **Can you use problem-based learning without cooperating with a subject teacher?**

Yes, you can. But problem-based learning will lose some of its very significant components. That does not imply, though, that problem-based learning without the cooperation of a subject teacher is not worth engaging in. If this is the case, you should bear in mind that your main objectives are linguistic in nature and that therefore the content of the report should bear a lower significance than linguistic content. Also try to find subject teachers who will be at least willing to check the problems that you have designed.

#### **What if the subject teacher is only willing to cooperate during some phases of the problem-based learning process?**

Any help of the subject teacher is welcome, even if he/she is only willing to act as the problem designer, for example. You will at least make sure that the problems that your students will work on are relevant and up-to-date, or that the students can contact the subject teacher if they feel that they need assistance in finding relevant sources for writing their reports.

#### **What if the subject teacher is willing to cooperate but is not fluent in the foreign language?**

The subject teacher simply has to be able to understand the content of the report. Another rather time-consuming option is that you ask your students to translate the report into their mother tongue.

#### **What if you get no response from the subject teacher(s) you contacted?**

Getting in touch with the subject teacher(s) will often take quite some time and energy. If you do not succeed after several attempts (personal contact, e-mail, phone), it is probably better not to count on an unreliable partner. Think about other teachers you could contact or simply sail the seas of problem-based learning on your own for the first time. Next time you will have some results to present (reports, glossaries), which will represent a further element of motivation for subject teachers to join you.

#### **How many problems should be prepared?**

If possible, the number of problems should exceed the number of student groups participating in problem-based learning. This way every group will have some choice.

#### **Can a problem be redesigned according to the suggestions of the students?**

Yes, but a subject teacher should check the problem for its professional relevance.

#### **What can you do if after the first meeting of the group the students claim they could find no relevant sources for some aspects of the problem they were to research and therefore suggest a redefinition of the problem?**

In this case the students should be given the opportunity to adapt the problem accordingly, yet not later than during the second meeting of the group. The students may have in fact discovered an entirely different aspect of the problem after researching it for some time. Allowing a redefinition of a problem will increase their feeling of owning the project and prevent them from straying and losing focus. Of course, a subject teacher should be consulted again in case of major changes to the problem.

### **How do you handle drop-outs?**

Each teacher should find her/his way.

### **What do you do if a new member wants to join the team?**

Define the rules before the problem-based learning process starts. It certainly depends on how soon/late a new member wants to join in. Experience shows that it may be difficult to catch up with the group after the first meeting and impossible after the second one. The teams should not be put into the position to decide whether to accept a new member or not.

### **What do you do if a team falls apart during the project?**

You should explain clearly and early enough that student attendance is compulsory. If one member drops out it means that other members have to take his/her responsibility over and realize his/her tasks. It may also affect team organization and role distribution.

### **Some students do not want to work in teams. Should you force them?**

They lack the feeling of responsibility for the group project and would prefer hard individual work. Experience shows that team members learn to appreciate group collaboration by the end of the project. There are very few who claim that group work is frustrating.

## **5.2 PBL cycle**

### **What if you find out that a problem does not work?**

It happens soon enough. Students may try and reformulate it during PBL Step 1 and they would like to do it. The subject teacher can be involved. If there are more problems than teams, a new problem can be chosen.

### **What if students say that a problem does not work?**

Students may think the problem does not work if they failed to break out of their ordinary thinking patterns. They need detailed guidance. You can suggest looking at the problem from a different perspective (e.g., instead of the company's perspective they can choose the customer's) or else suggest using another tool for breaking down the problem.

### **What if the students want to change the problem during the second meeting?**

Too late. They have done something wrong during their first meeting (PBL Steps 1-5) and they must cope with it themselves. This can represent a new challenge for the team.

### **What if they want to reformulate the problem?**

It depends on you and perhaps a subject teacher, too. There should be some room for negotiation and the policy should not be firmly determined for all situations.

### **How much can you interfere with group work?**

Interference with contents – the teacher's role is that of facilitator. There is not just one possible and satisfactory solution to the problem and the students' approach may be as good as yours. If the approach is not satisfactory, allow them to find that out themselves. Remember students must own the problem. Your role is to assist. Interference with group dynamics – the teacher's responsibility is to create and maintain a safe, democratic and creative environment that allows students to maintain their self-respect and dignity. It is your duty to interfere and

sanction demeaning and improper behaviour. Raise the issue and discuss it openly within the group in question. Stress the importance of following basic ground rules for teamwork.

**What if your students find only sources in their mother tongue and decide to translate the report?**

You should not discourage this but you need to make it clear that it will be difficult for them when they come across technical vocabulary. For this reason you need to insist that they find related articles in English.

**What if your students cannot find any reliable sources?**

This is simply lack of information search skills, or not being able to set appropriate key words.

## **5.3 PBL products**

**How long should a report be?**

The length of the report depends on your aims and the amount of time you can devote to written work.

**How can you prevent plagiarism?**

There are a number of things you can do that reduce students' opportunities to plagiarize:

- explain what plagiarism is,
- teach them to paraphrase what they have read and cite their sources correctly,
- encourage them to take notes and create mind maps while reading – they should include these in the project documentation,
- ask your students to write an annotated list of references – their annotations are in fact descriptions of the sources consulted and comments on their usefulness,
- ask your students to rewrite passages that seem to be copied,
- learn more about plagiarism yourself and how you can fight against it ([www.turnitin.com](http://www.turnitin.com)).

**What do you do if you do not know the terminological equivalents in your mother tongue?**

If your students have difficulties identifying their mother tongue equivalents for terms, you can try the following:

- check on-line bi- and multilingual specialized dictionaries,
- check parallel corpora or comparable corpora,
- ask the subject teacher.

**How long should a presentation be?**

Avoid lengthy presentations. 20 minutes per presentation is generally the maximum an audience can take.

**What do you do if a student does not want to speak in public?**

There will always be students who fall ill, fall asleep or simply do not care to turn up and by doing so they endanger the success of the whole group. It is our belief that each student should be encouraged to speak in public, but you will get students who are simply helpless against the debilitating speech fright or students who have a serious speech problem. These students should not be forced to appear in front of a public. The problem-based learning process offers numerous opportunities to make up for the missing part. However, such cases are exceptional, and reluctance to speak in public should not be an excuse for the students who would like to avoid the stress of the oral presentation.

**Should you insist on computer slide presentations or can you allow transparencies?**

Plan A includes a PowerPoint presentation. Instruct your students that they should always have transparencies as a back-up in case the computer presentation fails (e.g., faulty floppy, etc.).

## 5.4 PBL assessment

### **What if the report is full of spelling mistakes?**

Ask them to use the spell check and then turn the report in once more.

### **What if the report is a collection of five mini-reports and is not cohesive?**

A report should be a cohesive group product. In this case you should lower their grade.

### **Shall all students speak at the presentation?**

Yes. Each one should contribute to the presentation and the teacher must see clearly what their contribution is.

### **What if the students do not want to participate in self- and peer-assessment?**

No way. Peer assessment is a part of the assessment stage and the students should be informed about it in advance.

### **What if the subject teacher does not include the grade given by him for the contents of the report in the total grade for his course?**

In this case you have two options. The first one is to include his grade in the overall grade for the report and take it into consideration while calculating the overall problem-based learning grade. However, since you may find this controversial because we are language teachers and the grade we give should reflect linguistic knowledge and related issues, the second option is to ask the subject teacher to grade the reports simply with 'fail' or 'pass' – in this case the pass mark represents the pre-condition for a pass mark for the linguistic contents, which remains to bear the whole weight of the final mark.

## 6. APPENDICES

### 6.1 Sample problems

#### 6.1.1 Social work

##### **ANOREXIA**

Your friend has become dangerously thin. You suspect that she is suffering from anorexia. You would like to help her but you don't really know much about the disorder. What actually is anorexia? How can the patients be helped? What can friends, parents and other relatives do to prevent (cure) it?

#### 6.1.2 Health and safety at work

##### **WHAT'S GOING WRONG IN OFFICES?**

A young woman started her job in an office a year ago. She works long hours every day and uses a computer in her work. Now she has started complaining that she has headaches, sore eyes and pains in her hand, especially in her right wrist. She has a constant feeling of fatigue. Find out what might be the cause(s) of her problems. Suggest solutions.

#### 6.1.3 Police

##### **COMPLAINTS AGAINST THE POLICE**

People may complain when they do not agree with the police procedures or if they believe their human rights are violated. Do people know what the complaint procedure is about? There is a special office within the police institution the complaints are sent to. What kind of complaints do they receive? Some public media have special rubrics where journalists report about breaching human rights by the police. How can the number of complaints be reduced?

#### 6.1.4 Army

##### **MISSION TRAINING**

A group of 20 fire fighters have to be trained properly before half of them are sent to the mission to Afghanistan. They will be responsible for the safety and security of the Kabul airport. They will have to work together with fire fighters from other countries. 2 months are available to provide all necessary contacts with professional institutions and to organize training in Slovenia. What will you focus on when organizing this training?

#### 6.1.5 Management

##### **DIFFERENCES IN MARKETING STRATEGIES: SLOVENIA VS. USA**

The general purpose of this project is to compare the marketing strategies and performance of businesses of two countries, the U.S. and Slovenia, as well as the environmental contexts in which they operate. More specifically the project aims to answer the following questions:

1. To what extent are there differences in levels of performance?
2. How do these differences relate to differences in marketing strategies and environmental context?

This project addresses these questions by examining differences in the marketing strategies, environmental contexts and performance of businesses from the two geographic locations. The concern here is not only with socio-cultural factors as influences, but also with the reality of decision-making as reflected by strategies, environments and performance.

## 6.1.6 Social/political science

### **DISCRIMINATION AGAINST WOMEN IN SLOVENIAN POLITICS**

Historically, women have had difficulty gaining admission to political positions. Despite all the compelling arguments in favour of increased female participation in politics, women are basically underrepresented in the political institutions in Slovenia. Slovenia has never had a female president or prime minister. To what extent do women in Slovenia participate in political life? What obstacles prevent women from seeking elective or public office from succeeding? Are there any laws and/or regulations to enhance female representation in political bodies? Suggest policy-making strategies to advance the number of female representatives in the political arena.

## 6.1.7 Mechanical engineering

### **ENERGY PROBLEM IN A MOUNTAIN COTTAGE**



Solar collectors on the roofs of mountain cottages can no longer cover growing energy needs. Power generators operating on diesel had to be stopped because of pollution. The cottages need more energy for space heating, lighting, cooking, washing; in short, for the comfort of visitors.

Source: [www.pedc.se/lentec](http://www.pedc.se/lentec)

## 6.1.8 Traffic

### **EASYJET IS COMING – WHAT WILL ADRIA DO?**

Adria Airways is Slovenia's national carrier and has rich experience in charter and scheduled flights, while EasyJet is a low-fare European airline. Flying to London and back from Ljubljana with Adria Airways will cost you approximately 400 Euros, while flying with EasyJet on the same route can cost you as little as 20 Euros.

How can Adria Airways survive against such strong competition?

## 6.1.9 Tourism

### **UPGRADING A RESTAURANT**

A group of investors has acquired a city restaurant. The restaurant seems to attract a substantial number of alcoholics and downmarket guests. The owners would like to change the present profile of regular guests: they are interested in attracting upmarket customers. They have approached your team of experts for help.

## 6.2 Checklist for determining roles in a team

Team members should identify their strengths and weaknesses and based on the results from the table below try to decide who will take which role in their team. You might notice that the roles named in the table do not match exactly with the names used on p. 13 (Roles in a group). This checklist is an adapted version of team roles developed by Belbin Associates and has proved as a useful tool when deciding upon the team roles. For example, the students who are recognized as investigators or shapers by the checklist may be appointed as designers in a team; an organiser can perform a task of a chairperson; a finisher may become an efficient secretary or editor. The checklist helps students to identify their preferences and special skills that may be useful for the team.

Teams should get the descriptions in the table below. Who in their team could best play each role?

	Who is like this?	Who is not like this?
<b>INNOVATOR</b> Produces ideas, is imaginative, radical, clever. Can be over-sensitive and may need careful handling.		
<b>INVESTIGATOR</b> Finds things out, always knows someone who ..., enthusiastic, but can be lazy.		
<b>CHAIRPERSON</b> Self-confident, commands respect, good speaker, thinks positively, is good at guiding a team. Can be bossy and domineering.		
<b>SHAPER</b> Energetic, drives everyone along, needs to succeed, makes things happen. Can become impatient if things do not go their own way.		
<b>TEAM WORKER</b> Sympathetic, understanding, sensitive, leads from behind, places the team above personal concerns.		
<b>ORGANISER</b> Methodical, hard working, reliable, turns ideas into work.		
<b>FINISHER</b> Conscientious, works hard to finish things properly. Meets deadlines, pays attention to details.		

*Adapted from: Gibbs, G. Learning in Teams, Oxford Centre for Staff Development*

### 6.3 Sample agreement

#### AGREEMENT

Project title: \_\_\_\_\_ Date: \_\_\_\_\_

It is agreed that the members of this group will:

Name	Component of the project task the person is responsible for:
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

I hereby agree to do the following:

I will carry out my tasks and meet the deadlines set by the group.

I will attend group meetings regularly.

I will equally contribute to the group and do everything towards the success of this group.

I will try to help other students as well as ask for help if I need it.

This contract has been freely signed by all group members listed as signatories. By signing the contract the parties are bound to carry out all duties and obligations.

	Address
I _____	_____

Signature: \_\_\_\_\_

I _____	_____
---------	-------

Signature: \_\_\_\_\_

I _____	_____
---------	-------

Signature: \_\_\_\_\_

I _____	_____
---------	-------

Signature: \_\_\_\_\_

I _____	_____
---------	-------

Signature: \_\_\_\_\_

I have read and signed this document with the understanding that sanctions will occur if I fail to complete the work assigned to me.

*Designed by: Vukadinović, N.*



## 6.4 Correction codes

<b>WW</b>	Wrong word; e.g., “school” instead of “college”.
<b>WF</b>	Wrong form of word; e.g., noun instead of adjective.
<b>WO</b>	Wrong word order.
<b>TF</b>	Wrong form of verb; e.g., infinitive instead of “-ing” form.
<b>T</b>	Wrong tense; e.g., past simple instead of present perfect.
<b>SWA</b>	Error of agreement; e.g., between subject and verb, or article and noun.
<b>P</b>	Punctuation.
<b>Sp</b>	Spelling.
<b>^</b>	Missing word.
<b>Coh</b>	Lack of cohesion (no glue that holds a piece of writing together; no transitions from one idea or sentence to another).
<b>?</b>	Meaning unclear.

## 6.5 Report feedback form

**Project title:** \_\_\_\_\_

**Project members:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

<b>Layout/structure</b>	
<b>Introduction</b> <ul style="list-style-type: none"> <li>- description of the problem</li> <li>- areas of investigation</li> <li>- literary sources used</li> <li>- extra research</li> <li>- division of work</li> </ul>	
<b>Central part</b> <ul style="list-style-type: none"> <li>- reasons for the problem explained</li> <li>- references used</li> </ul>	
<b>Conclusion</b> <ul style="list-style-type: none"> <li>- solutions/recommendations given</li> </ul>	
<b>Glossary of technical terms</b>	
<b>Bibliography listed correctly</b>	
<b>Structure</b> <ul style="list-style-type: none"> <li>- sub-headings</li> <li>- paragraphs</li> </ul>	
<b>Spelling</b>	
<b>Style</b>	
<b>Cohesion</b>	
<b>Punctuation</b>	
<b>Grammar</b> <ul style="list-style-type: none"> <li>- tenses</li> <li>- word order</li> <li>- other</li> </ul>	
<b>Attachments provided</b>	
<b>Other remarks</b>	

## 6.6 Mock presentation checklist

### **Structure:**

- Is the presentation well prepared?
- Is it relevant to the audience?
- Is it interesting?
- Is it relevant to the content?
- Are the problem and the solutions clearly presented?
- Is there a clear structure: beginning – main part – end?
- Are different parts coordinated and linked together?

### **Speech:**

- Does the speaker speak clearly?
- Does the speaker speak without reading?
- Does the speaker speak at the right speed?
- Does the speaker use appropriate language?
- Is the volume varied and controlled?

### **Questions and answers:**

- Does the speaker invite and answer the questions adequately?

### **Body language:**

- Does the speaker establish and maintain eye contact with the audience?
- Does the speaker look confident?
- Does the speaker support the message with his/her body language?

### **Visuals:**

- Are visuals well prepared?
- Do they support the message?
- Is the AV equipment appropriately used?

### **Timing:**

- Is the speaker aware of the time limit?

## 7. FURTHER READING

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## **7.5 PBL Step 5**

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