MeLLANGE

Multilingual eLearning in LANGuage Engineering

Best practices in e-learning content creation and development

September 2007

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INTRODUCTION

These specifications have been developed to enhance the creation of shared resources within the MeLLANGE consortium, and to provide best practices in terms of e-learning development. The purpose of establishing specifications for the development of e-learning materials is, on one hand to provide order and guidance to teachers who have an experience in traditional teaching but who do not master very well the online environment in order to guarantee an integrated, coherent and consistent pedagogical experience for the learner. On the other hand, these specifications could be of help to researchers in the field to work altogether to verify and explain all the specific teaching models used to elaborate learning programmes in the online environments.

This set of guidelines specifically deals with the problem of adapting traditional teaching contents to the Internet environment, since putting learning materials online means more than converting paper-based materials to an online format. Designing or adapting online materials is a complex process in which the content and the technology used to disseminate these in the most engaging and effective manner are equally important. Essentially, designers need to take into account the following factors:

- the characteristics of the learning activity;
- the characteristics of the target audience, and;
- the characteristics of the multimedia devices that they have access to

that is, they need to establish the desired instructional outcomes first, and only then focus on the content and electronic means of distributing it.

These guidelines aim not only at helping the MeLLANGE consortium to create or adapt online materials, but are also meant to be of help to researchers in the field for verifying and officially adopt the different teaching models and the various learning patterns they generate. The reader is presented with suggestions based on current best practices in this area rather than rules to comply with.

One of the goals of the MeLLANGE consortium is to design several e-learning modules that could be part of a European Masters in Translation and Technology. In order to achieve this goal, the consortium has been working on creating an integrated, coherent and consistent learning curriculum. Two online courses have been developed for several curriculum areas.

The present report is organised as follows:
The first chapter deals with a number of theoretical approaches specific to e-learning development. The introduction to this chapter underlines the importance of adopting the learner-centred teaching approach specific to e-learning development. The following section deals with two different e-learning approaches, namely blended and autonomous learning, and offers a description of the e-learning evaluation system used for MeLLANGE. The chapter ends with a number of considerations on the relationship between e-learning and learning theories, which are the basis of any instructional system.

The second chapter deals with more practical guidelines for the organisation of the MeLLANGE online courses. Special emphasis is placed on the description of the MeLLANGE learning objectives.

The third and final chapter focuses on practical guidelines related to content organisation, course structure, and interactivity.

1 Theoretical approaches to e-learning design

1.1 Teacher-centred vs learner-centred approaches

This section of the report concentrates on the description of the teacher-centred and the learner-centred learning approaches. These two approaches can be used both in traditional classroom teaching and in online learning settings.

In the traditional classroom teaching in continental Europe (teaching in a further and adult education environment in the UK tends to be more learner-centred), the learner has a more passive role since the teacher is more responsible than the student for the latter's learning path and progress. Nevertheless, students can also decide on their own what, when, and how to study provided they are motivated enough to do so.

The e-learning experience, on the other hand, should always be driven by a learner-centred approach with the learner taking more responsibility for his/her learning. Furthermore, the facilitator's role is still an important one as he/she continues to take part in the online learning programme by tailoring content to the learners' standards, evaluating students and providing constructive feedback throughout the programme.

Developing online material with the learner in mind is one way of ensuring that the learner is sufficiently engaged and performs at an optimum level. The following features of the learner-centred approach demonstrate its importance:

- it involves authentic learning tasks perceived as meaningful by the learner
- it aims to discover those learning methods that stimulate the learner to construct actively his/her own understanding of the information and tasks presented, rather than follow a set of instructions
- it emphasises learning how to solve problems rather than learning facts
- it supports collaborative learning.

1.2 Autonomous and blended learning

Two learning settings can be taken into account when creating or adapting online materials: *autonomous learning* and *blended learning*.

Autonomous learning proceeds at a pace and method that are chosen freely by the individual learners. The ideal scenario involves a conscious selection by the learner of appropriate study materials which are suitable to their needs and preferred method of study.

Blended learning, on the other hand, blends different event-based activities including face-to-face learning, Web-based learning, and autonomous learning. This blend of various learning strategies and delivery methods is designed to optimise the learning experience, and minimises the feeling of isolation during the learning process.

The MeLLANGE courses aim to address two target audiences: academic and professional users. As a result, they are made up of self-standing units that can be either taken on their own while referencing additional hyperlinked resources – to meet the needs of time-constrained professional translators – or integrated into blended learning environments, which are more common in academic settings.

The next section deals with the evaluation system specific to the online learning experience.

1.3 E-learning evaluation system

This section deals with the evaluation system which is an essential and integral part of the design and planning of any online programme, be it autonomous or blended. The evaluation should span over the whole lifecycle of the programme and should be both *formative* and *summative*. *Formative* evaluation should be used to revise instruction as the course is being taken, whereas *summative* evaluation should be conducted after instruction has been completed, and provides information on how effectively the learner has achieved the main goals stated by the online programme he/she is taking; it is also a basis for course revision and future planning.

An online programme should include learner-centred evaluation and should lead to long-term learner autonomy and sustainability. The evaluation should acknowledge the diversity of the users' learning styles and should meet their needs through a wide range of evaluation activities. The evaluation should also follow the latest best practices in the field of e-learning and should use the opportunities created by the technologies employed.

As already stated, online evaluation should be both formative and summative. For a better understanding of the importance of these two types of evaluation which are vital for e-learning development, a fuller description is provided in the following two sections.

1.3.1 Formative evaluation

The *formative* assessment is primarily aimed at monitoring and improving learning.
This may be achieved in a number of ways:

- by providing feedback that helps learners recognise where they need to improve

For example, the Moodle platform (See section 3) used to implement the MeLLANGE online courses offers the possibility to provide feedback to help learners know where they need to improve.

The lesson function on Moodle may be used to give learners feedback on the progress they have been making throughout the course. On any content page that could be a question or branch table page the writer/developer can choose to end it by giving choices which determine the next page of the lesson. The advantage is that the learners' choices can be graded and can determine the next page of the lesson that will appear or they can tell the learners where they need to improve.

- by providing opportunities for peer assessment, with appropriate understanding of the required performance criteria

Peer assessment is one of the most important components of formative evaluation. Its main goal is to encourage learners to make independent judgements. Peer assessment occurs when learners critically analyse their colleagues' work. This way they become more autonomous, responsible and involved in the learning programme they are taking.

To better understand the advantages and disadvantages that peer assessment offers to online education programmes, we will take as example the collaborative translation project exercise we implemented in our Specialised Translation course. (see eg. Figure 1)

5 **Collaborative translation project**

Unit 1: Creating a translation project in a team

The primary goal of this unit is to increase your expertise in specialised translation. This is an interactive and collaborative unit which means that:

▪ You will go through all steps involved in a translation project. In the previous units you learnt about these different steps, but now you will try to put them in practice in the process of translating a specialised text.

▪ You will do the translation project in a team as this is what language professionals often have to do. This means that you have to divide labour and share your knowledge with other participants of this translation unit.

So, how is this going to work?

There will be tasks that each participant will have to do and also tasks wich will be carried out in groups. There will be four groups in total: **Group A**, **Group B** and **Group C** and **Group D**.

Below, you can find the description of the different tasks you will have to accomplish as a translation team. Please go through the tasks in this order!

Figure 1: Section on Collaborative translation project from the Specialised Translation course

This collaborative translation project exercise puts the learners in a real-life work scenario, they become professionals in a translation company and they need to work all together on a translation project. Having previously learned about this and everything it involves, they are facing at this point of the course the responsibility of managing all together the putting-in-

place, development and achievement of a translation project.

For this exercise, learners ought to work both individually and in teams. Their individual work is then discussed on in specific forums designed especially for this. For instance, the first step of the exercise is that all participants need to agree on the working languages and translation direction. Once, each of the participants chose its source language and target language, they need to decide all together what is the source language and the target language for the translation project.

The fact that participants need to make decisions all together, puts them in a situation of taking more responsibility for their work.

Another important way of using peer assessment is to offer the possibility to learners to review their colleagues work. This is the case for the quality check step in our exercise. Participants need to review their colleagues' translations and then discuss about possible corrections in the forum designed especially for this.

For this exercise, the technical support used to enhance communication among learners is the forum tool.

Peer assessment has also disadvantages such as the fact that learners may lack the ability to evaluate each other, or they may not like it because they can be discriminated against or even misunderstood. It is for this reason that peer assessment needs to be constantly followed by a facilitator.

- by providing opportunities for self assessment

Self assessment is another important component of formative evaluation. It occurs when learners critically analyse their own work, knowledge and skills. It helps learners to form judgments about their strengths and weaknesses.

The MeLLANGE online courses propose a great number of self assessment exercises, dispersed throughout the two implemented courses.

The MeLLANGE consortium created a number of ongoing evaluation activities such as quizzes, multiple choice (see e.g. Figure 2) and fill-in exercises, yes/no questions, etc. All these activities (designed in Hot Potatoes, but there are other alternatives available) ensured not only the interactivity with the learner but the ongoing evaluation process as well.

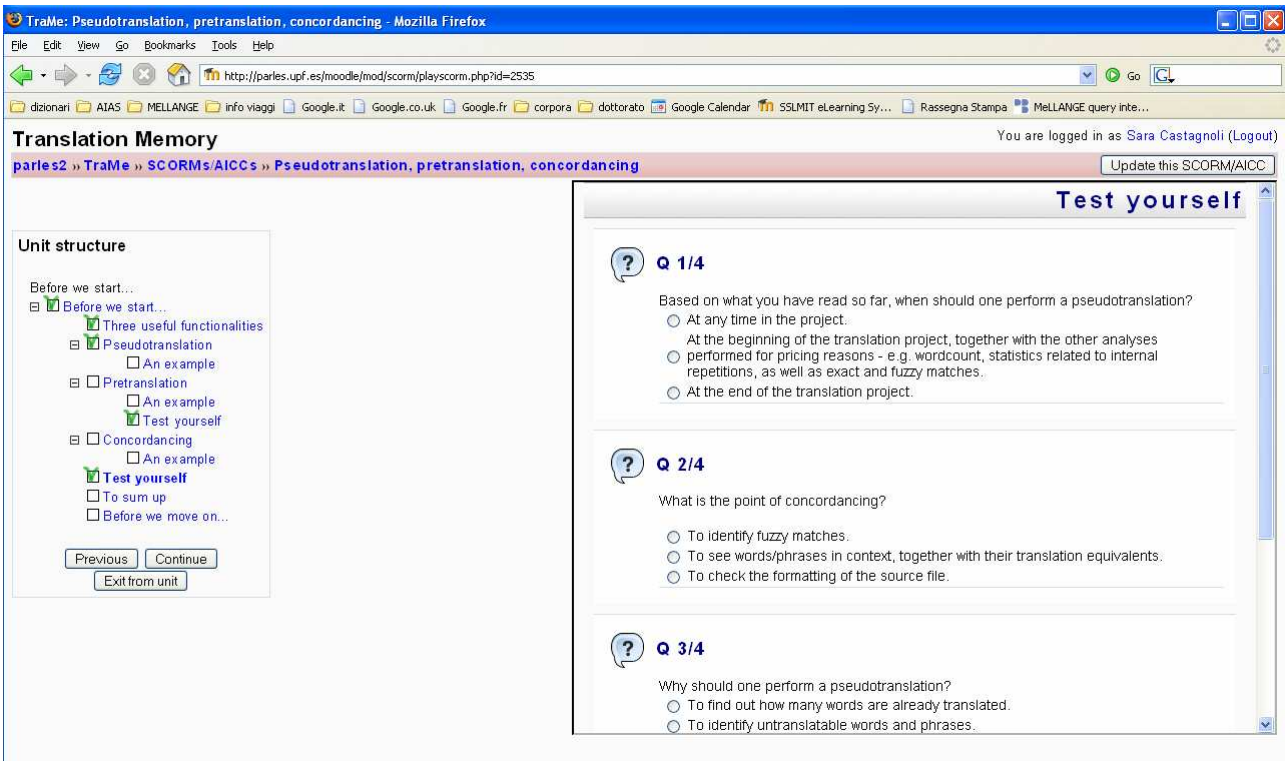

Figure 2: Multiple choice exercise within a unit from the Translation Memory course

The activities integrated within the MeLLANGE learning units were designed to facilitate the self-evaluation of the trainees and are specific to the autonomous learning setting, whereas those outside the units are specific to the blended learning setting.

1.3.2 Summative evaluation

The *summative* evaluation is performed at the end of a course or a course section to measure how effectively the learner accomplished the goals stated in the programme. It may occur at two different levels.

The first level is the **learning results level**. A summative evaluation can be conducted to check whether the learner has actually acquired the knowledge, skills and attitudes that the programme was supposed to convey. The evaluation at this level can consist either of self-sustainable activities or mediated ones. The former category includes multiple choice and yes/no questions, fill-in exercises (see e.g. Figure) as well as reflection exercises to which the answers are provided together with extensive feedback to correct/incorrect choices. The latter category can contain exercises such as open questions, reflection exercises and open assignments which need to be followed by a facilitator who tailors feedback to the particular level at which each student is in his/her learning. The MeLLANGE online material include some reflection exercises, open assignments and open questions which have been created

outside the learning units and are specific to blended learning settings. These 100% online courses will be however used in various learning settings after the end of the project, allowing blended learning.

The second level is the **learner's reaction level**. In its simplest form, the summative evaluation conducted at this level measures how much the learners enjoyed the learning programme. The best example of summative evaluation within the MeLLANGE programme is the usability evaluation questionnaire associated with each unit (see Appendix 1). The questionnaire covers issues regarding, among others, the relevance of the learning objects, the ability of the programme to generate and maintain a sufficient level of interest and motivation, the amount and suitability of the interactive exercises, the ease of navigation and the perceived value.

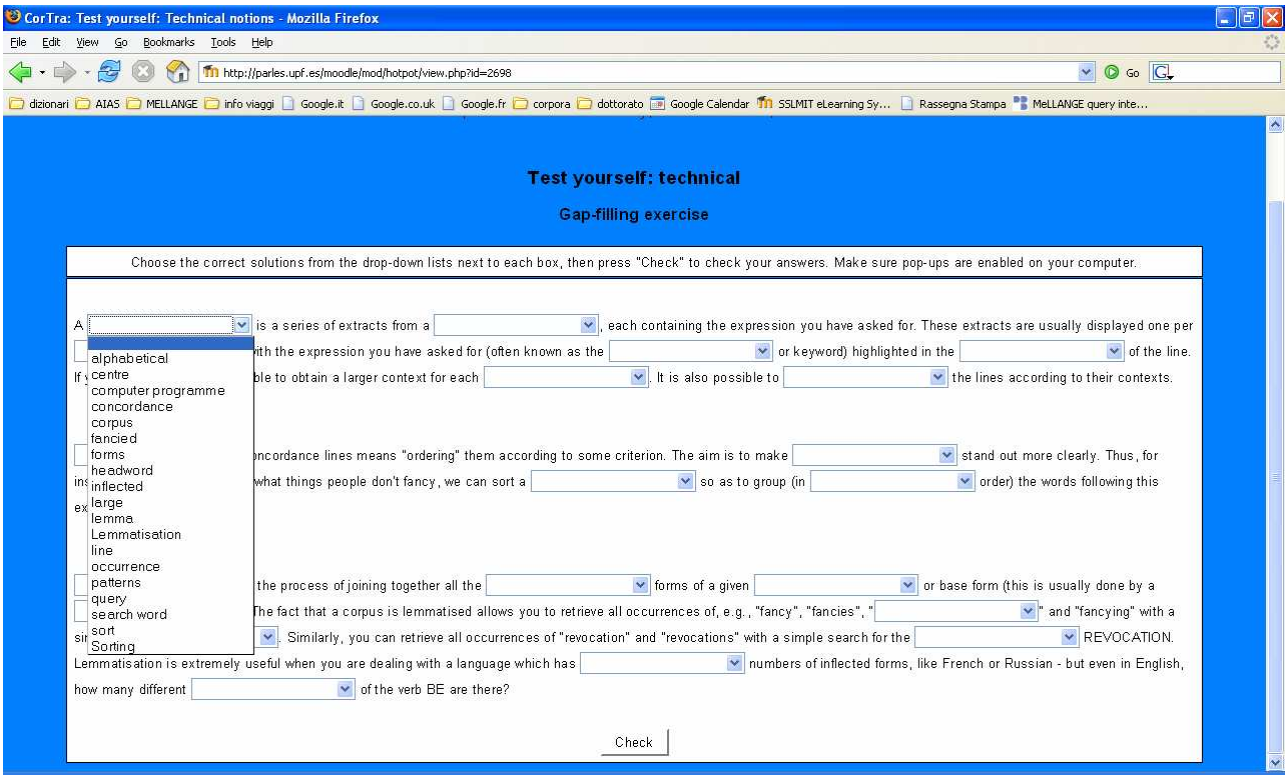

Figure 3: Fill-in exercise from the MeLLANGE course on Corpora for Translation

1.4 E-learning and learning theories

"The goal of any instructional system is to promote learning. Therefore, before any learning materials are developed, educators must know the principles of learning and how students learn. This is especially true for online learning, where the instructor and the learner are

separated. The development of effective online learning materials should be based on sound learning theories.

... the delivery medium is not the determining factor in the quality of learning; rather, the design of the course determines the effectiveness of the learning" (Rovai, 2002).

Loveless (Loveless & alii, 1995), quoted by Béslile (2007) considers that "It is not possible to consider the use of IT in classrooms without reflecting upon one's beliefs about learning and teaching. IT capability can be seen as having much more to do with an approach of ways of learning and working than as the development of a set of skills". With this position Loveless along with Rovai come to reinforce the idea that anyone wishing to create online materials needs to be aware of the old and new approaches to learning, traditional teachers need to change their attitudes, their values and beliefs towards the online experience.

At this point, an unavoidable question arises: Why is it so important to be aware of the learning theories and teaching models before creating online educational materials? Research has led us to find several important reasons for this.

First and foremost, any e-learning educational programme is extremely difficult to change, like any other educational system. To avoid "repetitive behaviours" (Béslile 2007), developers should have a clear idea of the fundamental basis on which teaching and learning activities are built.

Secondly, we believe that the coherence and successful outcomes of an online educational programme can only be achieved through awareness of the strategic choices involved.

Last but not least, there is no doubt that the "knowledge society", (Béslile 2007) cannot function properly unless it has a clear understanding of the different teaching models that are constantly changing by the different contexts and by the various requirements for diversified competences.

We will now be now focusing on the differences between a learning theory and a teaching model.

According to Béslile (2007) a learning theory provides explanations on a coherent and stable organisation of the didactic principles involved. The learning theories are based on different principles of repetitive phenomena that have been verified to some extent. The four learning theories exemplified are described below. They are based on various psychological and social theories that explain the functioning of human beings or human groups or institutions.

Whereas learning theories have been verified to a certain extent, teaching models represent hypothetical organisations or structures, often based on analogy, used in analysing or explaining a phenomenon and generally leading to applied action. Teaching is a communication process that activates learning.

In education, teachers often think that they work intuitively. Nevertheless, research on these practices has proved that there are various beliefs that explain the overall organisation patterns of teachers' practice.

It is also important to underline the fact that each teaching model leads to different expectations in terms of learning results.

According to Bélisle (2007) there are four main learning theories:

The first one is the behaviourist theory of learning. This theory is based on the psychological theory of stimulus-response paradigm according to which learning means to integrate changes in one's behaviour, in response to all the environmental and contextual stimuli. This theory presents learning as a "conditioned response". This theory could generate several teaching approaches be it constructivist, problem-based or reflection based teaching.

The second learning theory according to the same author represents learning as a "processing of information". This is nothing else than the cognitive approach to learning (cognitivism: Ausbel, Gagné). In this theory, learning means to acquire information and new knowledge. Research has lead us to conclude that in this theory learning is organized by a systematic analysis of the sequence of learning events, in order to make optimal use of the encoding processes taking into account the limitations of the human memory.

The third learning theory is the constructivist theory of learning according to which learning is seen as the construction of new knowledge. This learning theory is based on the active problem solving and connecting facts approaches. It is through these approaches that the learner can construct new knowledge. This learning theory could be related to the problem-based teaching where content is organised so that the learner faces real-life work scenarios which enhance the construction of new knowledge by resolving authentic tasks, real problems.

The forth and the final theory is the one that considers learning through the social process. Also called the socio-cultural theory of learning, it is focusing on the personal development of the learner which becomes the actor and the author of his own development through social interaction. This learning theory could generate the collaborative teaching approach where content is organised in such a way that the learner has an active role in the process of learning. The socio cultural feature could be explained by the networked teams specific to the collaborative teaching.

The two sets of learning theories we have presented so far had a great deal of impact on the teaching models that we identify later on in this paper and the didactic principles that helped us in creating the MeLLANGE online material.

The next section deals with different possible teaching models that can be applied to traditional and or online educational programme. Moreover, we present possible patterns of e-content organisation, patterns that could be formed taking into account the different

teaching models adopted. There are several teaching models presented and they generate several possible organisational patterns for e-content.

Without joining the discussion regarding the supremacy of content over technology or technology over content, we acknowledge the great importance of both and we believe that the following practical recommendations regarding content organisation should be familiar to e-learning content developers.

- **Catch the learner's attention.** According to Gagné (1985) designers should catch the learners' attention by presenting a problem or a new situation using multimedia techniques. The objectives of the course must be clearly described, stating what learners will be able to achieve and how they will be able to use the newly-acquired knowledge.
  In the MeLLANGE Translation Memory course we chose to present the introductory elements to learners by using a multimedia flash movie animation. With this animation, we catch the learners' attention by clearly explaining to them what are the objectives of this TM course, that they will be acquainted with TM tools and that they will be able to use, from that moment on translation memories in their work. (See e.g Figure 4)

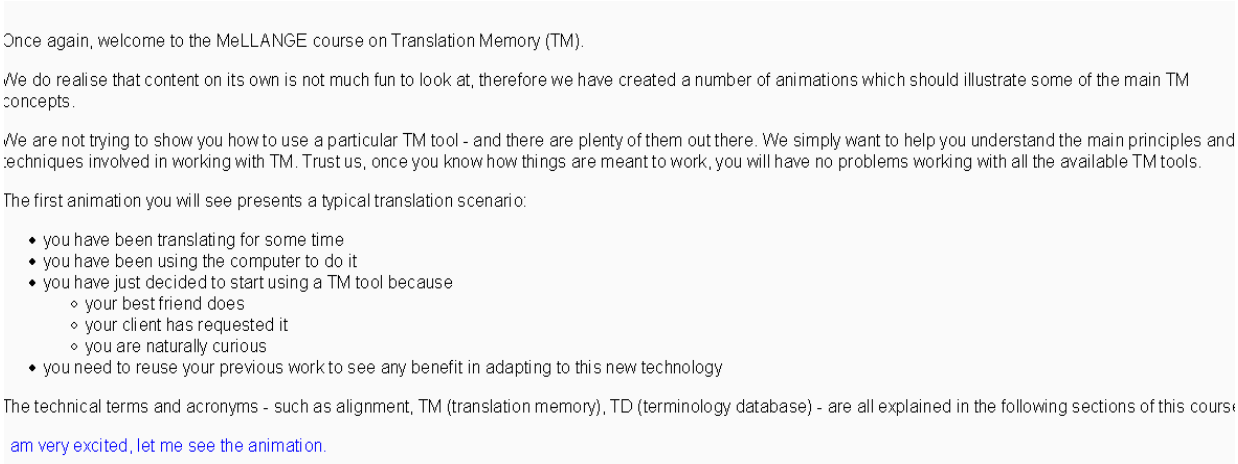

Figure 4 : Intro page of the unit on Working with TM from the MeLLANGE TM course

- **Recall prior knowledge**. Another important aspect when designing online materials is to recall prior knowledge while making its relevance to the current issues as transparent as possible.
  This principle represented a very important element when designing the MeLLANGE courses. Concretely, every unit of every section of each course begins with a number of learning objects among which the "Prerequisites" one. This learning object states

clearly what the learners need to knowledge before starting the work on a specific subject-matter.

For instance, in order to understand alignment in the creation of translation memories, learners need to have:

- general knowledge about:
    - file formats and their extensions
    - file management - creating, renaming, removing files and folders on your hard drive
    - Internet browsing, as well as downloading files to your hard drive
- specialist knowledge:
    - what translation memory (TM) is and what needs it addresses
    - the structure of a simple translation memory (See e.g. Figure 4)

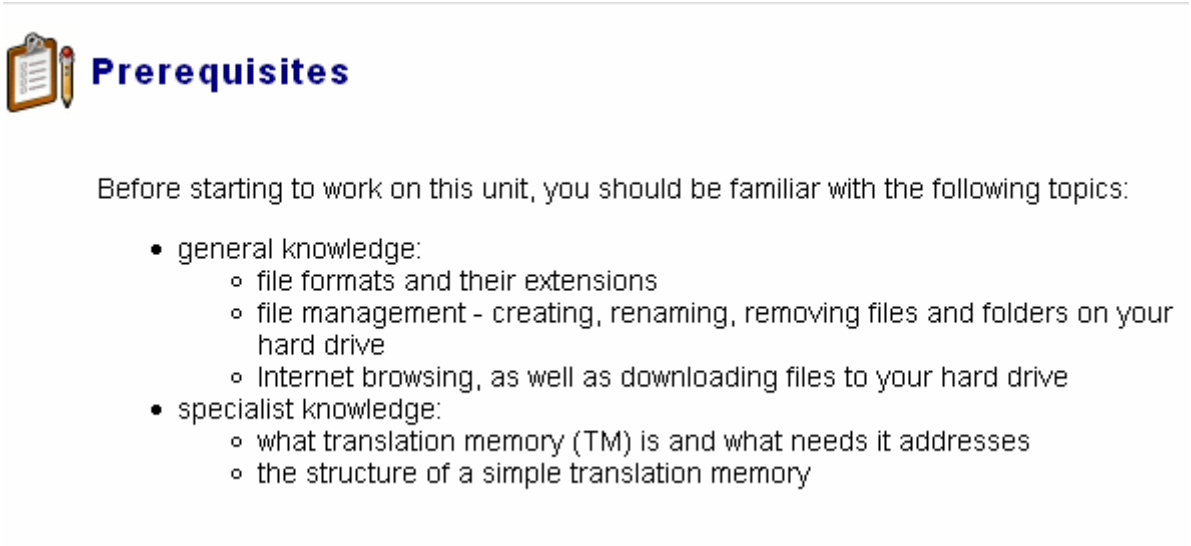

Figure 5: Prerequisites in the unit on Alignement in the MeLLANGE TM course

Another possibility to recall prior knowledge is to introduce in the learning units “Let’s summarise so far” pages. These pages can be also called transition pages. They were used in MeLLANGE to make quick summaries of learning content; this way, the learners can more easily apprehend the new knowledge they’re acquiring. (See e.g. Figure 6)

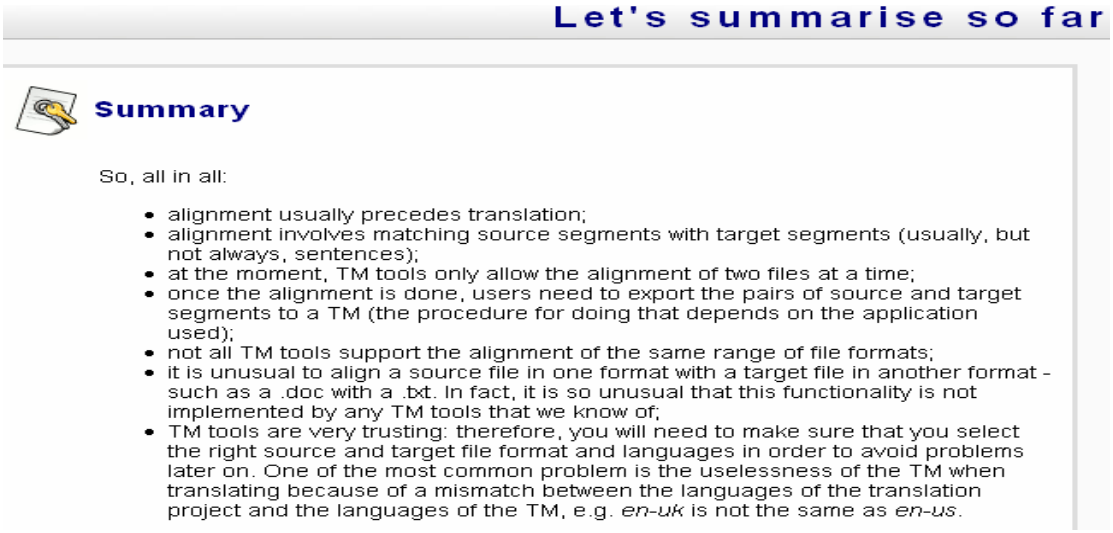

Figure 6: Let's summarise so far page in the Alignement unit within the TM course

- **Provide guidance for learning.** The presentation of content should be kept separate from the instructions on how to learn. The MeLLANGE courses contain different types of evaluation exercices providing the learner with the correct/ incorrect answers. The learner is encouraged not to look first at the correct answers but to first take the exercises so that he/ she can valuate the new knowledge acquired.
- **Provide the learner with feedback** leading to an analysis of how his/her activity meets the required evaluation criteria. The best example for this principle is when the facilitator gives feedback to learners. In the same time, this principle is a very important characteristic of blended learning.

But from which theoretical approaches to the teaching and learning processes do such practical considerations originate?

1.5 The impact of teaching models on e-content organisation

This section focuses mainly on the impact of different teaching models on the organisation of e-content. A short description of different teaching approaches is followed by a summary of possible different didactic patterns of e-content organisation. Moreover, research in this field could verify whether teaching models generate specific knowledge acquirement of a certain learning theory.

1.5.1 Teaching models

According to the **constructivist teaching model**, the learning process is an active, constructive and target-oriented process. This model allows for a deeper understanding, as well as sustainable learning outcomes.

Another innovative teaching approach is the **collaborative teaching model**. This approach is characterised by networked teams that aim at constructing knowledge.
For example, the MeLLANGE consortium created a collaborative translation project unit. This unit is mainly characterised by the work team which allows learners to construct knowledge, to give feedback to the others' work and to construct their own judgements and therefore become more independent and more responsible of their learning. This teaching model works very well with the peer assessment type of evaluation as it offers learners to evaluate their own progress and the others' work in order to become more responsible for their learning.

The **problem-based teaching approach** offers learners the possibility to confront real-life or nearly authentic tasks. Solving all these tasks enhances subject-specific skills and creativity.
This teaching model is at the basis of the MeLLANGE collaborative translation project unit. Learners face the challenge of accomplishing a translation project, as if they were professional translators. They are divided into several teams; each team is responsible of a certain step of the translation project workflow. They are in charge of giving feedback on their own work but also on the others' work. They have to find solutions to their problems, within their own team or ask advice from other teams. This problem-based approach sets them in real-life work scenarios and encourages them to develop more responsibility, independence and creativity in their own learning process.

The **reflection teaching model** is characterised by exercises and tests that allow learners to identify knowledge gaps. The reflection process can take place collectively through:

- discussions and classroom sessions for reflections within teams;
- posting project reports on a learning platform;
- discussions of projects in the classroom/online (forum, chat).

The MeLLANGE team hosted an online forum and chat during the second testing phase of the two implemented courses. Learners had the chance to directly communicate with the facilitators, asking questions related to the two courses. Following this testing phase, feedback was received that helped later to improve the existing material.
When creating online materials, these four teaching models can interact with each other. They focus not only on the course developers' approach to the creation of online materials but also on the learner's reaction to the learning process. Moreover, they interact directly with the didactic principles of content organisation that are addressed in the following section. Teaching models are complementary to didactic principles that affect e-content organisation.

1.5.2 Content organisation patterns according to didactic principles

Depending on the different didactic principles one adopts, there are numerous possible content organisation patterns. Four of them are described below.

The first pattern is the **behaviourist pattern** according to which content should be organised as follows: definition – explanation – example – test – case study – summary. According to this pattern, a lesson should begin with the definition of the concepts to be acquired by learners, and continue with the explanation of these concepts followed by examples. Next, the evaluation process is introduced with a series of tests and case studies. Finally, a summary is included at the end of the lesson. This organisational pattern of content could be originating from the behaviourist learning theory described earlier in this paper and according to which learning means to integrate change's in one's behaviour, in response to all the environmental and contextual stimuli.

Another possible pattern of content organisation is the **behaviourist-cognitive** one according to which the teaching path should be organised as follows: motivation – information – definition – explanation – content – example – exercise – test – summary. Compared to the behaviourist pattern described above, the behaviourist-cognitive model begins by motivating the learner about the topic of the lesson and then presenting more information about it. These two steps are introduced to contextualise the subject matter of a specific field of study. After that is achieved, theoretical definitions can be introduced followed by explanations, new content, examples, exercises, tests and, finally, summaries. This organisational pattern originates from both behaviourist and cognitive learning approaches. This pattern combines the environmental and contextual stimuli by motivating the learner from the beginning about the reasons of acquiring the new knowledge in question, but is also leads to the construction of the new knowledge.

The third possible pattern for content organisation is the **cognitive-contructivist pattern** according to which a lesson should begin with several examples of the subject matter, followed by supporting information on the subject matter. Another series of examples is then presented before moving on to exercises. In this case, the pattern could be explained by the cognitive and constructive learning approaches according to which learning is a processing of information made through the use of multiple examples which lead to the construction of new knowledge.

The fourth and final pattern identified for content organisation is the **constructivist pattern** according to which the lesson should start with short interaction passages followed by case studies and examples of the subject matter. According to this pattern, it is in the middle of the lesson that the subject matter information should be introduced. This information is then explained and tested with different exercises. This pattern of a very interaction nature could originate from the socio-cultural learning approach as new information is presented through the use of interaction passages, case studies and examples.

It is important to note that the first two patterns follow a more traditional teaching style, whereas the last two follow a more pragmatic teaching style focusing on more interaction, examples and exercises. As for the creation of the MeLLANGE online material, the consortium did not follow a specific teaching model or organisational pattern, but combined these in order to simultaneously reach, as much as possible, the two target audiences: academics and professionals. The consortium did not decide to create different online material taking into account the two target audiences, but to create material that could address both audiences.

1.5.3 Proposal for MeLLANGE content organisation

The learning platform chosen to develop the MeLLANGE online courses is the Moodle collaborative platform. This open-source platform was selected to develop the MeLLANGE online courses because of the sound pedagogical principles on which it was built and also because of the numerous interactive activities that it supports. The design and development of Moodle take into account a particular learning philosophy referred to as **social constructionist pedagogy** (www.moodle.org).

This philosophy addresses four main concepts:

1. **Constructivism**. According to this principle, learners actively construct new knowledge as they interact with their environment. Moodle offers a lot of interactivity with its forums, chats or instant messaging. All these functions offer the opportunity to the learner to interact with the new learning environment.
2. **Constructionism**. Learning is particularly effective when constructing something for others to experience. Moodle offers various design opportunities from simple ones such as simple HTML pages to more sophisticated ones like the wikis, which allow learners to work collaboratively. The wiki function on Moodle exemplifies the constructionism principle of the platform as they are put in place for the learners to experience them.

3. **Social Constructivism**. This extends the idea of constructivism to a social group that is constructing things for one another, collaboratively creating a small culture of shared facts and meanings. This principle could be exemplified by the virtual classroom function offered by Moodle. This function allows teachers, who become facilitators in the online environment, to create a virtual class of students, who, at their turn become learners. Facilitators have the possibility to visualise the entire class, to add or remove learners, to create chats and forums for their learners. The fact that learners can form a class makes them a community which shares the same interests.
4. **Connected and Separate**. Looks into the motivations of individuals within a discussion. **Separate** is associated with objective behaviour defending their own ideas. **Connected** relates to subjective behaviour within discussions which accepts the others' points of view. **Constructed** behaviour is the one that combines both separate and connected reactions. Moodle offers a great number of interactive functions like forums, chats, instant messaging, wikis; which all allow communication to happen. Moreover, it encourages learners to develop different attitudes like accepting the others' point of view or defending their own ideas.

Among the four possible didactic principles described in the previous section, the one that best suited the development of MeLLANGE content and its integration with Moodle has been the **constructivist pattern**, which offers greater interaction and pragmatic content organisation that focuses on authentic learning tasks, multiple examples and exercises. This pattern has also been influencing the Moodle development philosophy.

2 Global architecture of the MeLLANGE courses

This section focuses on the global design of the MeLLANGE courses implemented so far on the open-source platform Moodle. The two courses have known different stages of development. Their final architecture if the fruit of three years of shared ideas, experiences and continuous work among all MeLLANGE partners.

The content of the MeLLANGE online learning programme is organised into Courses. Each Course covers one topic and is divided in sections dealing with subtopics. Each Section is divided into Units. Several academic and professional partners collaborated on creating e-content for each course. In order to make the whole programme consistent and address both target audiences (academic and professional), the consortium agreed on a global architecture.

Here are a number of theoretical suggestions regarding e-content organisation.

1. Each course should begin with a signpost unit that is common to both target audiences. This signpost unit serves as an introduction, gives a summary of the course and presents its learning objectives. It could be designed as a highly interactive and dynamic learning experience employing full-spectrum multimedia materials in order to motivate the trainees to complete the rest of the course.

   For instance, the MeLLANGE Translation Memory course begins with a 40-minute unit which presents brief and contextualised information about the rationale, main features and limitations of Translation Memory. Self-assessment questions with feedback are also very frequent in this unit to ensure that users gain an accurate overview of the field. Moreover, in order to cater for as many learning styles as possible, an interactive Flash demonstration of the main features of Translation Memory was also produced and included in the introductory section. The demonstration presents a real-life translation workflow scenario and contains full-motion screen captures of a translator at work using several functionalities of Translation Memory tools. It also contains explanatory captions, its pace matches the information to be taken in, and a toolbar (with Play/Pause/Fwd/Rew/Beginning/End buttons) is available to enable individuals to control the flow of information, too.

   These two resources, while providing similar information, have proven effective in capturing the users' attention, explaining clearly what the topic of the course is and how it is relevant for them, and therefore we recommend this combined approach of written online material with interactive Flash demonstrations for any online course.
2. The signpost unit should be followed by a self-assessment unit that gives the trainee the opportunity to evaluate his/hers knowledge and competencies before starting the course. He/she is then able to determine his achievements at the end of the course. An alternative to having self-assessment units at the beginning and end of the course is to have self-assessment interactive exercises throughout the course. This latter alternative was implemented by the consortium.
3. Thirdly, following input from the industry partners, the MeLLANGE e-learning content represents a significant improvement compared to traditional academic e-content because of its increased focus on providing short and clear explanations and tutorials on a wide range of issues to do with Translation and Technology. The very encouraging feedback we have received from both university students and professional translators shows that such an approach is superior to traditional postings of long written materials on Virtual Learning Environments.

2.1 Possible formats for course structure

In this section we present the structure of the MeLLANGE online courses and we share our findings regarding what should be generally included in the structure of online courses designed both for academics and professionals.

2.1.1 Presentation and introduction

Course Structure

Each MeLLANGE Course has an Introduction page that contains the following information:

- Title
- Content Overview
- Learning Objectives
- Target Audience (see Figure 6)

Figure 6 presents the introduction page of the Corpora for Translation course developed by the MeLLANGE consortium. The title of the course appears clearly on the top of the page. Then, the developer makes a content overview of the course stating exactly what are the learning objectives of the entire course and what the learners will be able to do at the end of the course. Moreover, learners find out from in the introductory page that the course is made up of sequential units that should be taken in a specific order, and if there is need for improvement, learners are advised to go back and improve there what needs to be improved.

Unit Structure

Each Unit has an Introduction page that contains the following information:

- Prerequisites
- Learning outcomes
- Duration (see Figure 7)

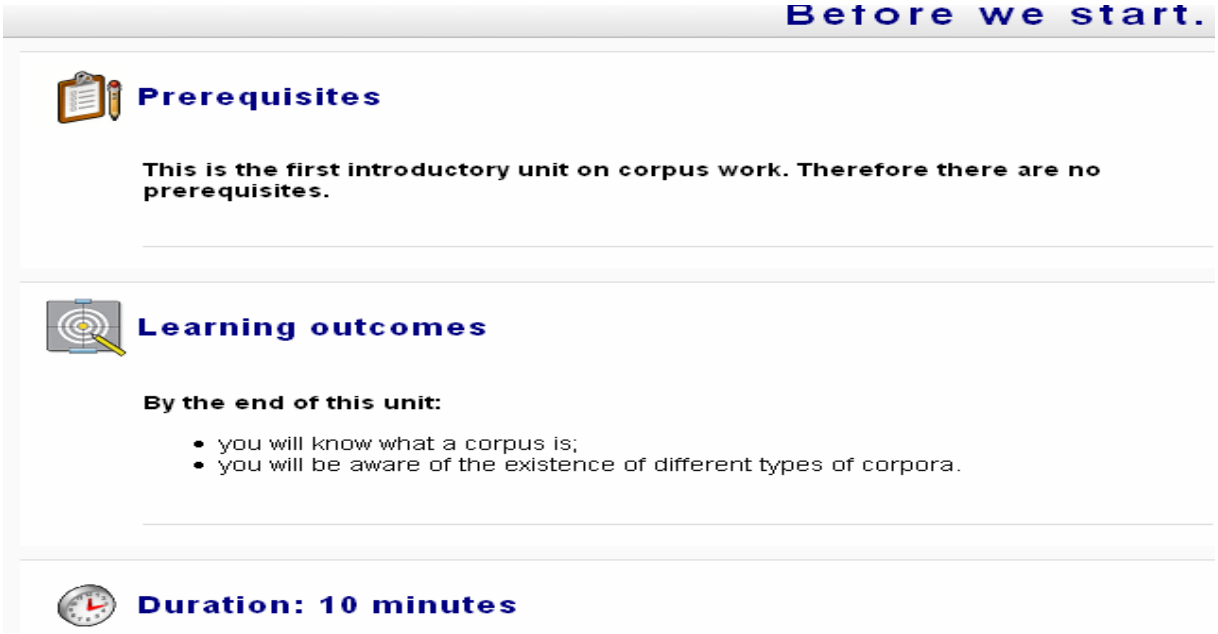

Figure 7: Introduction page of the unit on Introduction to Corpus use in translation

The example above shows the Introduction page of the first unit on Corpora for Translation. The first page contains information about the prerequisites that learners need to have before taking this unit, in this case, none. To follow, learners are told what they will gain by the end of the unit. Information on learning outcomes is very important as it gives learners the possibility to take or not the unit in question. The third element of the Introduction page deals with duration. Learners are given the duration of effective time spent on taking this unit, in this case working on this unit will take ten minutes.

In addition to all this, the Introduction page of a unit could also include information about the position in the overall curriculum, as well as any usage constraints (e.g. particular software, fast Internet connection, additional resources). This information was not introduced in the MeLLANGE courses as it was not relevant. Nevertheless, the institutions that will use the MeLLANGE materials and for which this set of best practices will be of very good help, they will have to introduce this further information onto their courses.

2.1.2 Composition and content

Course Structure

Each Course is composed of a series of Units that are listed on the Introduction page. It should be clearly stated whether the Units making up a Course have to be followed in a particular order (see Figure 6), or whether the learner is free to complete them in any order.

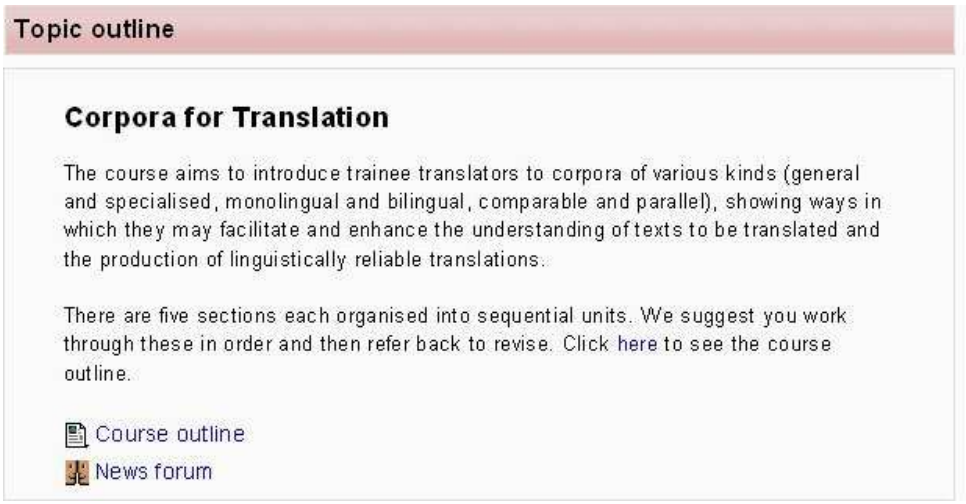

Figure 8: Introduction to the course on Corpora for Translation

In principle, only learners who are already familiar with (some of) the topic(s) of the course might find it useful to be able to skip units according to their interests, whereas learners approaching the course topic for the first time are recommended to follow the suggested learning path.

MeLLANGE courses were designed both for professionals and academics. This means that the online material is usable for both target audiences. Nevertheless, according to the target audience, the composition and content is organised differently:

- In academic settings Courses can contain as maximum as twenty-four Units for a total nominal duration of 20 hours.
- In professional settings, Courses can contain no more than eight Units for a total nominal duration of 6 hours.

Unit Structure

In theory, there are four types of units, each with its own characteristics. These features will help facilitators choose the best organisation for the e-content they are designing. The MeLLANGE consortium chose to design units which include elements of all these different types of units described below depending on the subject dealt with. Each course designer should be able to choose the appropriate elements.

- Signpost Unit or introduction unit
    - preferably fully multimedia; highly interactive; stand-alone and self-directed.
    - generally used as first Unit in the Course; features overall learning objectives of the course.
    - maximum nominal duration: 40 minutes.
    - free learner navigation through content via button-style interface.

  - tracking of progress data
  - common to both professional and academic target audiences.

- Self-Assessment Unit

  - fully multimedia; highly interactive; stand-alone and self-directed.
  - used to test knowledge of content and orient the learner by recommending Units (custom curriculum builder).
  - maximum nominal duration: 25 minutes.
  - tracking of progress data.
  - performance data can be output (hard copy).tracking optional.
  - common to both professional and academic targets.
  - MeLLANGE courses do not integrate this type of unit.

- Learning Content Unit

  - traditional electronic media; standard format files plus online databases (downloadable or online).
  - learner works alone.
  - made up of separate content and instructions components.
  - maximum nominal duration: 75 minutes.
  - may require use of external or off-line materials.
  - common to both professional and academic target audiences; professional learning paths will feature considerably fewer Learning Content Units than academic learning paths.

- Learning Event Unit

  - various media – synchronous web conferencing, conference calls; designed to enable the application of learned competences and experience sharing (e.g. virtual team projects, workshops, forums, webinars)
  - learner works with other learners and/or professor/facilitator.
  - made up of separate content and instructions components.
  - maximum nominal duration: 60 minutes.
  - may require use of external or off-line materials.
  - common to both professional and academic targets; potential for combining two targets in the same events to enrich learning by cross-fertilisation.

2.2 Learning objects and Moodle

2.2.1 Learning object and reusable learning object

What is a learning object (LO) and how can it be reused?

One good source of definition is the Institute of Electrical and Electronics Engineers which defines it as “any entity, digital or non-digital, which can be used, re-used or referenced during technology-supported learning” (see http://ltsc.ieee.org/wg12/)

A learning object can be viewed as a small amount of learning activity, built around a single learning object. The benefit of using a LO policy design in an online learning programme is that Los can be reused when the same learning objectives occur in a different learning situation, which increases cost-effectiveness.

In order to use successfully the LOs policy design course designers need to identify them clearly and they can do that by filling out a Content and Meta-data description (see Table 1 below).

The choice of the MeLLANGE consortium has been to organise content as Learning Objects. The main reason for this has been our concern with ensuring **reusability** and **inter-operability**.

Reusability While designing a topic map for the MeLLANGE curriculum, the partnership identified areas covered by several courses. For instance, an introductory unit on XML included in a course on Mark-up Languages could also be used to support units on Corpus annotation. Similarly, a unit on localizing XML documents could be used both in the Mark-up Languages course and the Localisation course.

Interoperability The partnership has been committed to designing content that can be portable from one e-learning platform to another, in other words which complies with existing e-learning standards such as SCORM and LOM (for meta-data description).

However, the choice to use the Moodle e-learning platform has also made the Consortium aware of the fact that developing standard-compliant material can be limiting, too. The platform offers many possibilities which the standard does not cover, especially in the case of interactive and collaborative activities.

In order to enable both interoperability and efficiency of material, the consortium decided:

1. to assimilate Learning Objects with some of the activities that the platform offers: Lessons, Quizzes, Workshops, Assignments, Forums, Glossaries, Tests, Wikis.

2. to ensure compliance with standards with respect to the informative parts of a course, implemented as SCORM packages (created with eXe, a free authoring tool that can be downloaded at http://www.exelearning.org/)

Thus, supposing the content developed by MeLLANGE needs to be transferred to a platform other than Moodle, the informative parts of a course may be directly moved, while interactive activities such as quizzes and forums would have to be adapted to the new platform.

2.2.2 Learning Object Meta-data

The MeLLANGE e-content has been developed as Learning Objects described by meta-data (LOM).

MeLLANGE chose to assimilate Learning Objects with some of the activities that Moodle offers, such as Lessons, Quizzes, Workshops, Assignments, Forums, Glossaries, Tests, Wikis and, to implement the informative parts of the courses as SCORM packages. It is for this reason that SCORM packages are the only content elements that may be described by meta-data. There are, however, metadata elements throughout the entire courses such as *Resources*, *Relates to* functions. The learning object metadata included in the SCORM packages implemented directly with eXe on Moodle are the following:

- Title
- Duration
- Prerequisites
- Learning objects

The latest versions of eXe provide enhanced support for metadata (1.0.1.eXe) and the forthcoming version of Moodle is reported to allow associating metadata to Moodle activities.

ACTIVITY	WORKSHOP		
TOPIC	MARK-UP LANGUAGES		
METADATA	GENERAL	Title:	Working with DTDs
		ID:	LO_XML_04
		Language:	EN
		Description:	Workshop on DTD usage. Writing the DTD for a given document and checking document validity against this DTD by using an XML validating parser.
	TECHNICAL	Format:	XML document, validating parser
		Type:	XML validating parser (ex Xerces), text editor
		Duration:	50 min.
	EDUCATIONAL	**Interactivity type:**	active
		Intended end-user:	learner
		Resource type	
		Language	
		Deliverable	correct DTD for a given XML file
		Pedagogical approach	mixed
		Context:	all
	RELATION	**Prerequisites:**	Introduction to XML syntax and XML DTD
		Resources:	LO_XML_001, L0_XML_003
		Relates to:	LO_XML_*, LO_CORP_ANNOTATION_*
CONTENT DESCRIPTION	Learners are supplied with an XML document (ideally an XML-encoded corpus) and are required to produce the DTD describing its structure. They are then required to validate the XML document they started with against the DTD they produced. The pedagogical approach was described as mixed, because instructors are supposed to provide learners with instructions as to the usage of a validating parser.		

Table 1: LOS table on "Workshop on DTD and XML validation"

3 MeLLANGE courses in Moodle

As stated in the introduction to this set of best practices, adapting traditional teaching content to the Internet environment involves much more than simply converting paper-based materials to an online format. In the MeLLANGE experience, even the conversion of non interactive materials available in electronic form (e.g. slides, pdf files) into interactive units and exercises can prove quite a difficult task. The most adequate choice for implementing online courses in the present context of eLearning development was a Learning Management System (LMS). Such platforms provide tools that allow not only to deliver

content but also to manage and assess the different stages of the learning process independently of whether learning takes place in a distance or in a blended format.

The LMS chosen by the Mellange project is Moodle (http://moodle.org). Among the available LMS, Moodle was considered to be most appropriate because, besides being an open source eLearning platform, it also contained the widest set of integrated applications to create content and interactive learning activities. Many of these activities fit very well with the objectives and philosophy of the MeLLANGE project.

3.1 Content creation

As stated in section 2.2, the MeLLANGE consortium has organised learning content as Learning Objects in order to ensure reusability and interoperability. Like most LMS, Moodle contains a module - the SCORM/AICC module - that allows course creators to easily upload any SCORM or AICC package to be included in the course. It is also important to note here that eXe, the XHTML editor chosen to create the core content in all the MeLLANGE courses, is optimised to export SCORM packages that can then be imported in a Moodle course. (See section 4 for a detailed description of the structure and form of the SCORM packages designed for MeLLANGE).

Apart from Learning Objects in either SCORM or AICC format, Moodle also allows for an easy creation and integration of non interactive and interactive content in its courses. New content can be created via the text editor or the HTML editor integrated in Moodle. The user simply chooses to create a new resource as text or as HTML and the interface for one of the two editors will appear. Once the document has been saved, the resource appears in one of the course blocks with the title assigned by its creator. As with any HTML editor, the documents that the Moodle HTML editor creates can contain static images or multimedia files in different formats: mp3, Flash, avi, etc. If the multimedia filter is activated, Moodle will provide an appropriate player automatically when the user clicks the link to the multimedia file.

Existing content such as web pages, graphic files, audio files, video files, documents in different formats (word, pdf, OpenOffice, etc.), or Flash animations can also be easily added as resources. Any type of file that exists can be uploaded into a course and stored on the server. The files on the server can be moved, renamed, edited or deleted. Existing web pages can also be added as resources by simply pointing to their URL instead of uploading them as HTML files.

Moodle also incorporates an additional module called **Lesson** which, similar to the SCORM-based Learning Objects, can incorporate self-assessment activities as well as content. The way the Lesson module activity delivers content and provides opportunities for self-assessment is rather unique. The structure of a lesson is basically like that of a web-based book. Students turn the pages to read the contents of the different sections of the lessons. Once a section is finished, they are presented with a short quiz the result of which determines what page they see next. Navigation through a lesson can be straightforward or complex depending on the design of the material being presented.

3.2 Evaluation tools

Moodle also contains a variety of additional tools which enhance the assessment possibilities and which can be part of Learning Objects encapsulated in SCORM packages. There are several modules that lend themselves very well to the different types of evaluation highlighted in section 1.3 of this paper.

3.2.1 The HotPot module

This module allows course managers to administer Hot Potatoes quizzes (http://www.halfbakedsoftware.com/) via Moodle. Hot Potatoes is a very popular and widely used application for educators which includes six sub-applications to create interactive multiple-choice, short-answer, jumbled-sentence, crossword, matching/ordering and gap-fill Web-based exercises.

Hot Potatoes quizzes are created on the user's local computer and then uploaded to the Moodle course. After students have taken the quizzes, different types of reports are generated which show the learners' scores, as well as how individual questions were answered. The reports also contain some statistical information that can be very valuable to the teachers in assessing the progress of the students individually or as a group. Feedback for the different answers can also be easily created and viewed by users, right after they have completed the activities. All of this makes Hot Potatoes and its integration with Moodle an ideal tool both for self-evaluation and for continuous assessment conducted by the teacher.

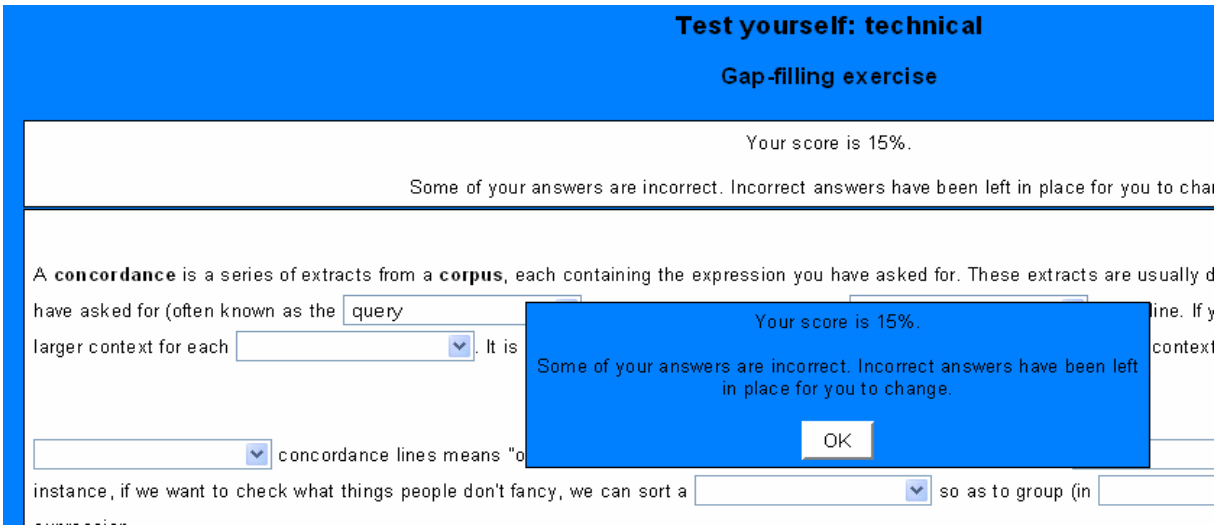

Figure 9: HotPotato exercise within the course on Corpora for Translation

The figure above underlines a gap-filling exercise added in the MeLLANGE courses with the HotPotato module. The evaluation exercise has been taken by the learner. The learner is been given his scores, which in this case 15% of the answers are correct. Moreover, the learner is given instructions on what to do next, namely to pass once again the evaluation test.

3.2.2 The Quiz module

This module allows the course manager to create and deliver quizzes with different types of questions, e.g. multiple choice, true-false, and short answer questions. Once created, questions are kept in the course question database and can be re-used within the same course or exported to other Moodle courses. Quizzes can allow multiple attempts. Each attempt is automatically marked, and the teacher can choose whether to give feedback and/or show the correct answers. The results of the quizzes are exported to Moodle's gradebook and analysed with a sophisticated set of statistical tools. This module also allows for questions to be presented randomly. Finally, the course manager can set IP and password restrictions. All of these make the quiz module a very powerful and flexible tool for different types of assessment situations, either for self-assessment or for testing purposes.

The example below (See e.g. Figure 10) is a short answer questions exercise from the MeLLANGE Corpora for Translation course. The learner is being warned that its answer is incorrect, moreover he is being given the correct answer for the question he has been asked.

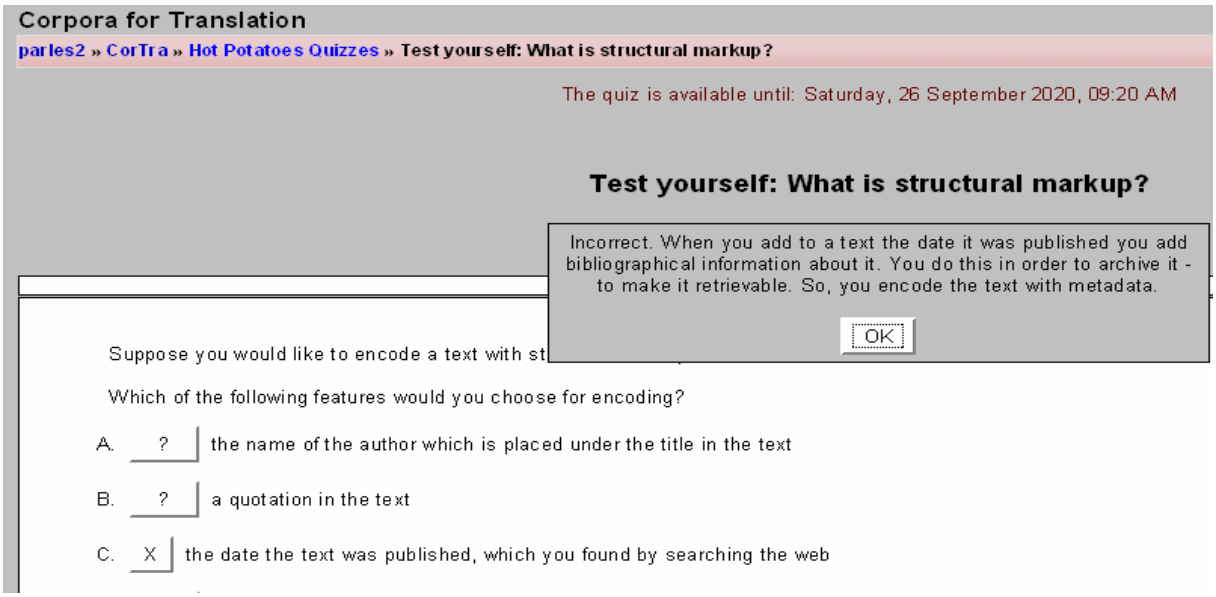

Figure 10: Quiz exercise within the course on Corpora for Translation

3.2.3 The Assignment module

Through the Assignment module students can submit their work to be graded by the teacher. This obviously implies that Assignments can be used in blended-learning settings only. In the MeLLANGE courses, two of the standard types of assignments are used: 'upload a single file' and 'online text'. With the 'upload a single file' type, students can upload any type of digital file (word, pdf, spreadsheet, or a compressed archive containing one or more files), while the 'online text' assignment allows users to edit text online, using the standard Moodle HTML editor. Teachers can grade the assignments online, add inline comments, or suggest changes.

The figure below shows an example of assignment given to learners in the MeLLANGE Markup Languages course.

The learners are explained:

- What they need to do;
- When they have to submit the assignment;
- What size the document to upload needs to have.

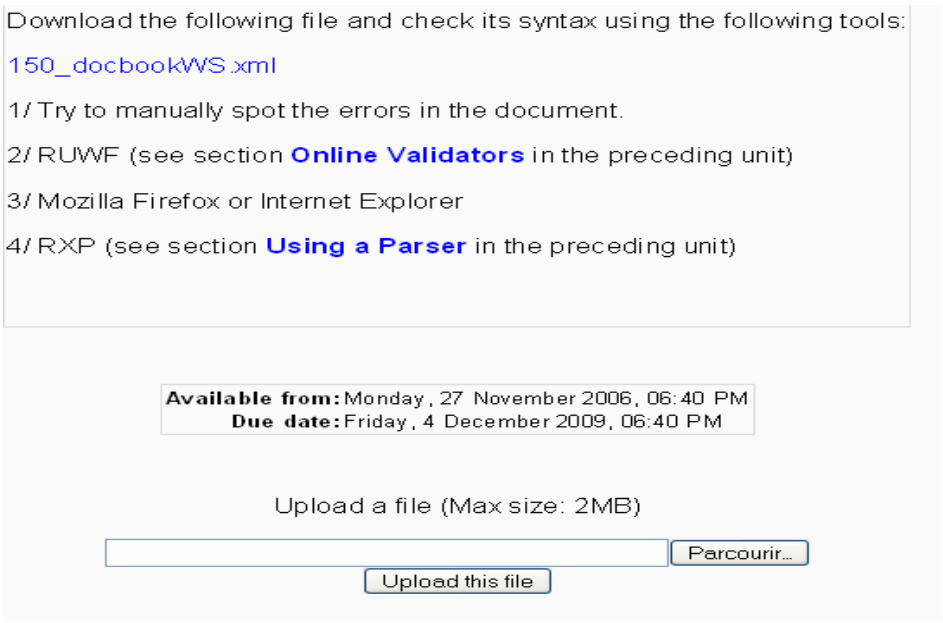

Figure 11: Assignment within the course on Markup Languages

3.2.4 Survey, Choice and Feedback modules

Besides the modules mentioned above, Moodle contains two additional tools that can be very useful for the type of evaluation mentioned in section 1.3.2 of these guidelines (*** formative and summative): the Survey, Choice and Feedback modules. The function of these modules is to gather and analyse ungraded feedback from users.

The **survey** module contains a set of verified survey instruments which seek to obtain feedback from students about the nature of the course. These are several sets of predetermined questions that have been found useful in assessing and stimulating learning in online environments. Unlike the survey module, the choice and feedback modules allow teachers to create their own questions. The simplest of the two modules is the **choice** module. With it, the teacher can create his/her own web polls in the form of one-question surveys together with a set of multiple possible responses. This can be really useful to collect rapid feedback or to stimulate thinking about a particular topic. The **feedback** module allows the teacher to create and conduct full surveys with different types of answers (e.g. multiple choice, open-ended answers) to collect feedback from students.

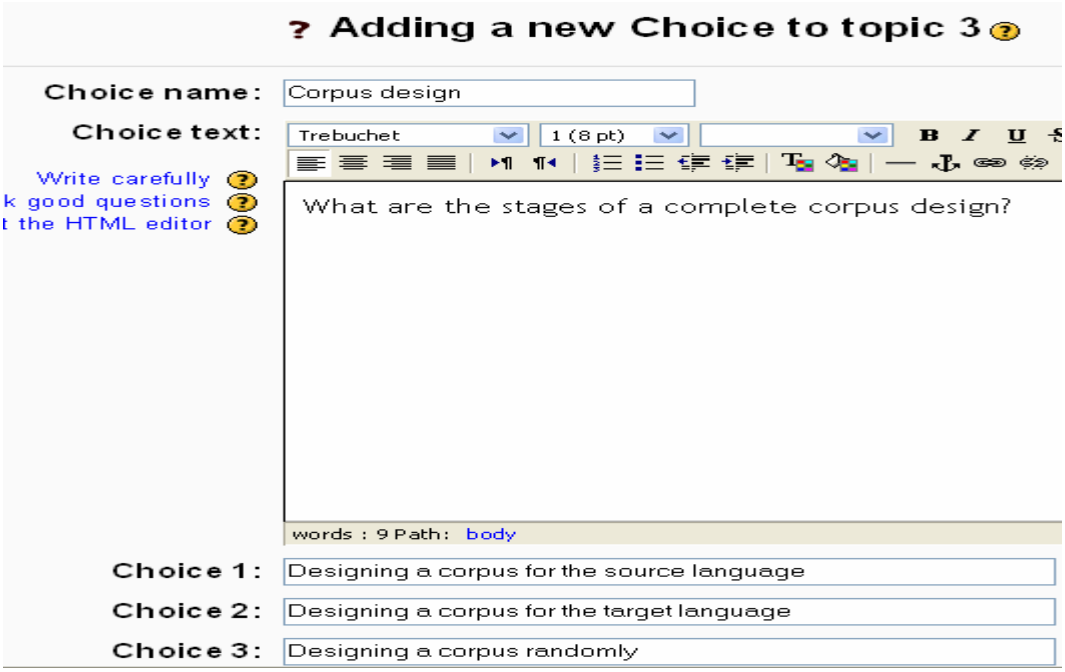

Figure 12: Choice function on Moodle

The figure above focuses on the way of editing choices on Moodle. Course developers are given the opportunity to ask a question about a specific topic and l give learners several correct answers. The choice module encourages learners to think rapidly about the topic in question and to give fast feedback.

3.3 Collaboration tools

One of the key ingredients for the success of any type of learner-centered approach is the use of technologies that enhance communication and collaboration between learners and instructors and/or between learners themselves. Moodle offers a wide variety of communication and collaboration tools.

3.3.1 Forums, chats and instant messaging

Forums, chats and instant messaging services are standard technologies that are widely used in online learning situations. The **chat** module allows students and instructors to have real-time synchronous discussions. Chats have proven to be very useful tools for group discussions about particular topics and to organise team work for specific class assignments. The Chat module contains functionalities that allow users to manage and review chat discussions.

The figure below exemplifies a real-time synchronous discussion between the learner and the facilitator. The chat module offers the chance to learners to interact directly with

facilitators. At their turn, facilitators can use the chat module to have more feedback on the course they have created.

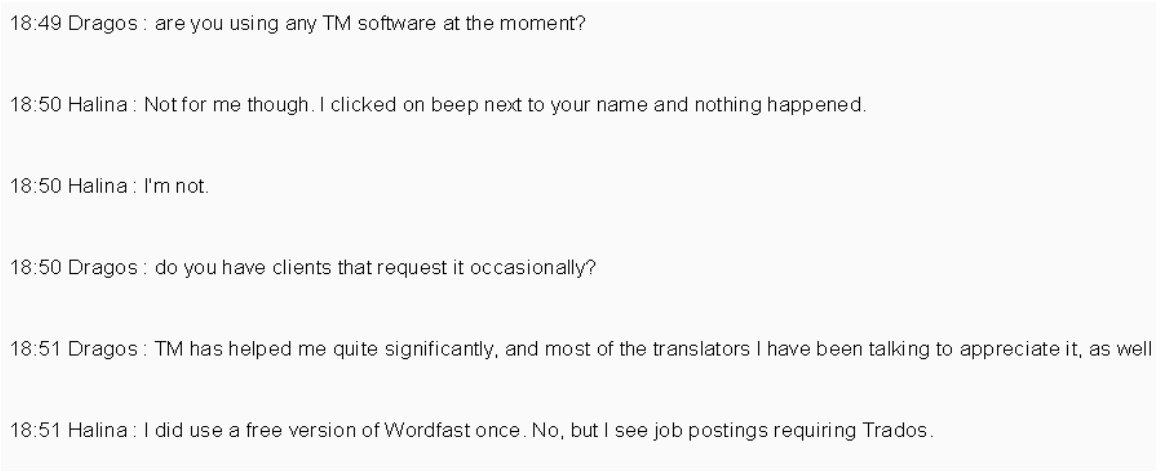

Figure 13: Chat discussion within the course on Translation Memory

The availability of an internal **instant messaging** system enhances the possibilities of synchronous communication provided by chats allowing for an easy one to one real-time interaction between participants.

Forums are also a very powerful tool for interaction between participants in a course. Students and teachers can post messages to each other and easily keep track of individual conversations. The ease of creation and management of forums with different possibilities of visualisation chosen by users, together with the use of the standard HTML editor for composing messages, makes this an area where Moodle really excels.
The example below shows a posting message from the facilitator of the course to all the learners announcing them that a second chat will be available for them on a previous date. Learners are encourages to ask questions and air their views.

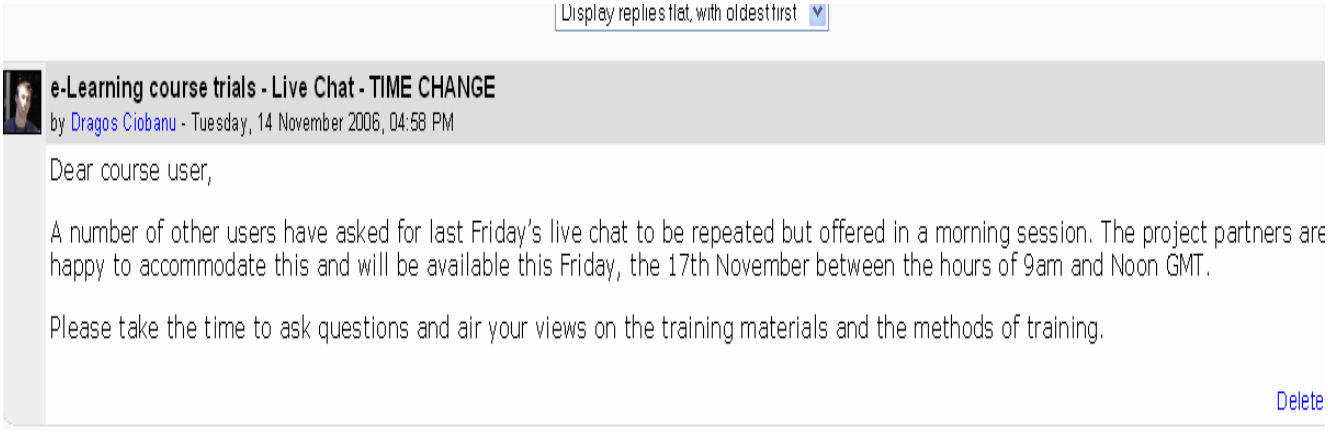

Figure 14: News forum within the course on Translation Memory

3.3.2 Wikis

Moodle also includes a wiki module. Wikis allow participants to work collaboratively by adding content or editing existing content online via a web browser without needing to know HTML. Although each group participating in the creation of a wiki can decide their own rules to organise their work, technically in a wiki no single person has final editorial control.

3.3.3 Glossary

The glossary is one the most original tools for collaborative work in Moodle. Glossaries allow students and instructors to jointly create and maintain different lists of definitions considered relevant in the context of the course. Since the glossary incorporates the standard Moodle HTML editor, a glossary entry can incorporate images, video clips or links to files. This makes it also useful to build repositories of artifacts that are collected in the course of the learning process. Entries can be searched or browsed in many different formats. Glossary entries can be exported from one glossary to another within the same course. Finally, filters can be enabled to hyperlink automatically content that is being created on Moodle to the.

definitions stored in the glossary – this functionality ensures that, provided a comprehensive glossary, learners are never at a loss regarding the meaning of terms. MeLLANGE created on Moodle a common glossary of e-learning and the figure below gives an insight on how the MeLLANGE glossary looks like.

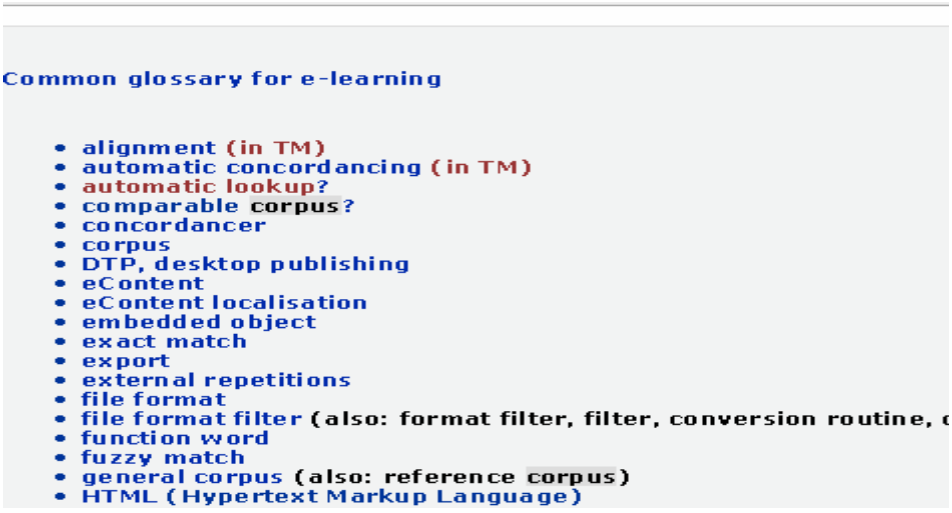

Figure 14: MeLLANGE glossary for e-learning

4 SCORM packages

MeLLANGE SCORM packages are built using the eXe application, and following a stylesheet together with a customised set of instructions specifically designed for the project. This chapter highlights their main features and describes how to use and implement these. These SCORM packages can be reused in the future and modified according to the needs of the future users.

4.1 eXe customisation for MeLLANGE

The customisation of eXe for MeLLANGE basically deals with two elements: iDevices and the standardwhite stylesheet. These two elements have been modified to meet the requirements of the MeLLANGE courses.

- iDevices, term employed in the terminology of eXe, the XHTML editor used to develop the MeLLANGE courses, can be viewed as Learning objects that have been introduced in the SCORM packages in order to meet the requirements of the MeLLANGE courses.
- the standardwhite stylesheet (css file) resembles to a normal style sheet which was designed and modified so that the courses have a unified presentation.

4.1.1 New iDevices

The new iDevices that have been created with the corresponding images and titles are the following:

- **Prerequisites**
  to state what the learners need to know in order to follow the current unit
- **Learning outcomes**
  to state what the learners will know at the end of the current unit
- **Duration**
  to state how long it will take the learners to work through the current unit
- **Assignment**
  to describe some practice that the learner has to do without help
- **Extended quote**
  to enter extended quotes or any information needing strong emphasis
- **Instructions**
  to specify any specific instructions that the learners must follow
- **Summary**

to state the summary of a section or subsection

- **Conclusion**

  to list at the end of a unit its key elements to remember

The first three new iDevices introduced form the Introduction page of a MeLLANGE content unit (See e.g. Figure 15). The consortium decided to introduce these elements as they are relevant for the learners who want to know from the beginning what they need to know before taking the unit, what they will acquire by the end of the unit and how long working on the unit will take them. This information offers them the opportunity to know whether they take or not the unit in question.

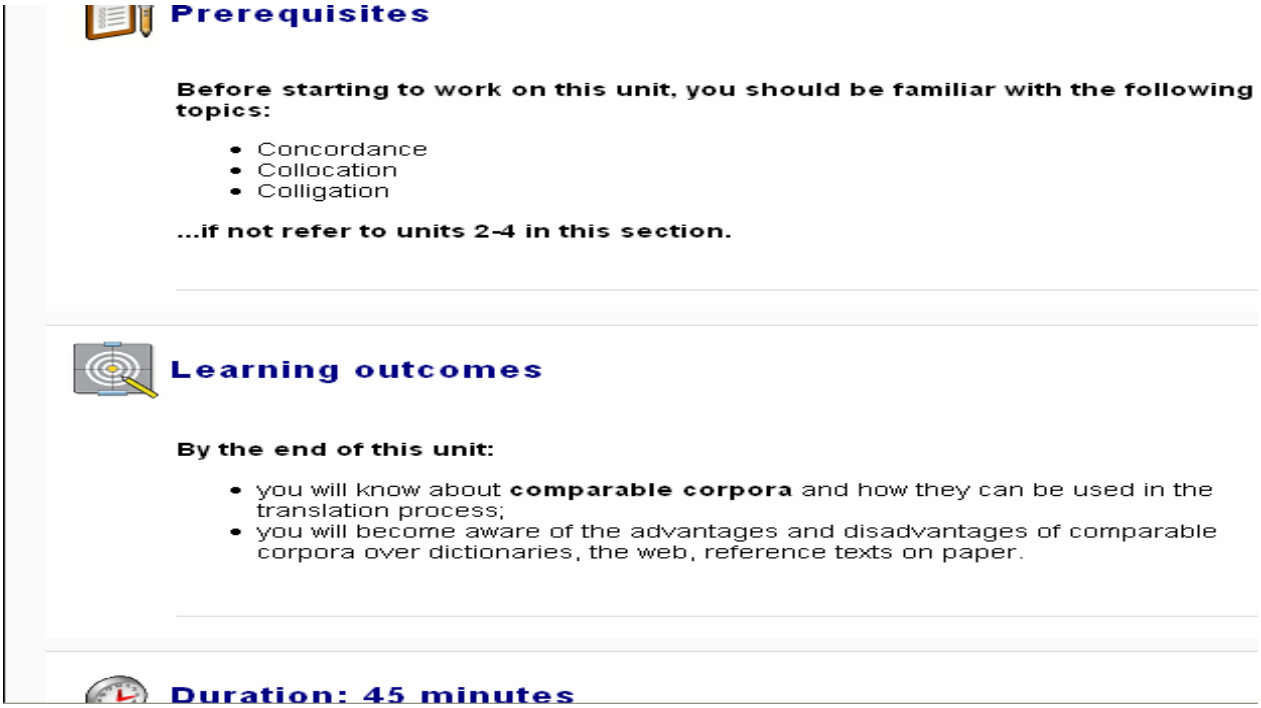

Figure 15: Introduction page of the unit on Comparable Corpora within the course on Corpora for Translation

The Instructions iDevice was introduced in order to divide the informative parts of the units from the actual instructions that the learners must follow.

The Summary device proved to be very helpful as it is an element that emphasises the didactic principle of recalling prior knowledge. Learners need to be actively reminded of what they have already acquired by working on the unit.

The Conclusion device always has to come at the end of a unit to underpin the key elements to remember.

4.1.2 Layout and standardwhite style sheet adaptation

The following recommendations are the fruit of our experience and they led us to specific choices concerning the design of the MeLLANGE courses.

1. The fonts and colours of the standardwhite stylesheet have been adapted so that the MeLLANGE courses have a unified presentation.

   These modifications can be obtained from the MeLLANGE community course on Moodle at: http://parles.upf.es/moodlercrc/course/view.php?id=30

   In the **standardwhite** style that has been adapted for MeLLANGE the style of all main titles (unit, sections and subsections) has been unified. The font used for body text is Arial 14 or 12 pt in black colour. Paragraph titles are in Bold.
2. When writing a unit, the use of long sentences and paragraphs should be avoided and bulleted lists or tables should be used instead. Here is an example of a bulleted list:

   - 1st item
     - 2nd item

   Note that only up to two levels should be used in a bulleted list.

3. The font used inside tables should be Arial (12pt). In the General properties of the table, you should set the Alignment to Centre, the Border to 1, and in the Advanced tab, set the Border colour to Black (#000000). Use a light gray, for instance, as a background colour for the header (#cccccc). Here is an example.

Category	**Font**	**Size**	**Attribute**
Body text	Arial	12	Normal
Paragraph title	Arial	12	Bold
Reference text	Arial	12	Underline

4.2 Instructions to write a SCORM unit for a MeLLANGE course

Each SCORM unit developed with the eXe application should follow the same structure with an introduction, several transitions and a conclusion.

The introduction should contain the following three items of information:

- Prerequisites, declaring what the learners need to know to follow the current unit
- Learning outcomes, specifying what the learners will know at the end of the current unit
- Duration, stating how long it will take the learners to work through the current unit

The transitions should add more interactivity and ensure that the learners have clearly understood the content of the unit. These transitions may take the following forms:

- In-progress summary
- Reflection
- Multi-choice questions
- True-false questions, etc.

The conclusion should remind the learners what they have just learned and explain how the content of the unit they have just completed is relevant to the next unit.
The next sub-sections describe how to create the recommended structure.

4.2.1 Introduction

When creating the introduction, please name the page "Before we start..." and use the **Prerequisites**, **Learning outcomes** and **Duration** iDevices.

a) Choose the **Prerequisites** iDevice and enter the standard text below:

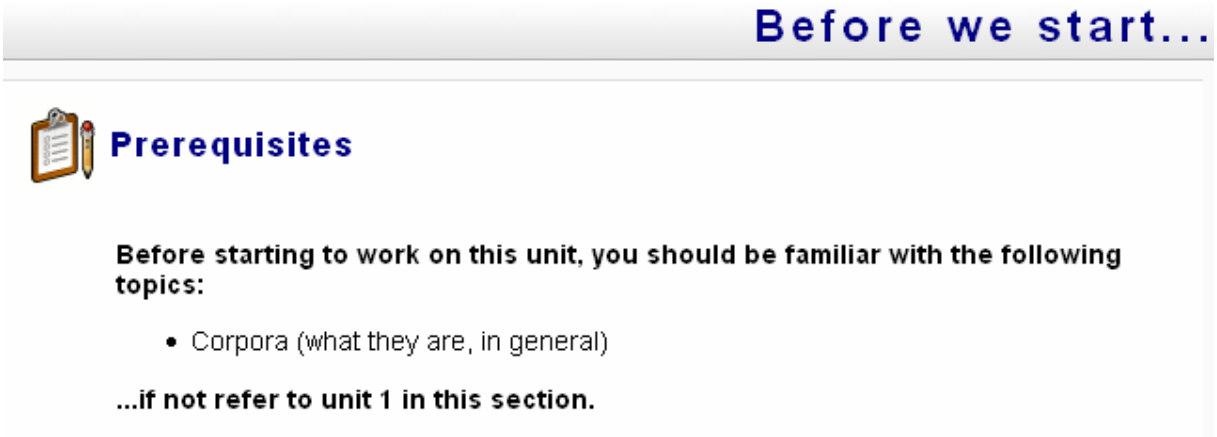

Figure 16: Prerequisites of a unit within the course on Corpora for Translation

The figure above shows the prerequisites for the unit on Using a monolingual corpora to understand a source text. Learners are given the prerequisites for this unit, namely they need to know what corpora are in general. If not they are guided to take unit 1 from the same

section before taking this unit. For this iDevice MeLLANGE agreed on a standard text that is on Bold in the example above.

b) Choose the **Learning outcomes** iDevice with the Target icon and use the standard text below:
The example below presents the learning outcomes of the unit on Using monolingual corpora to understand a source text from the MeLLANGE Corpora for Translation course. The MeLLANGE consortium chose a standard text to introduce to learners the learning outcomes, the standard text is in Bold. Moreover, all the new terms used they need to be in bold, in this example topics such as concordacing, lemmatisation, collocation. Bold style puts an emphasis on the new topics presented.

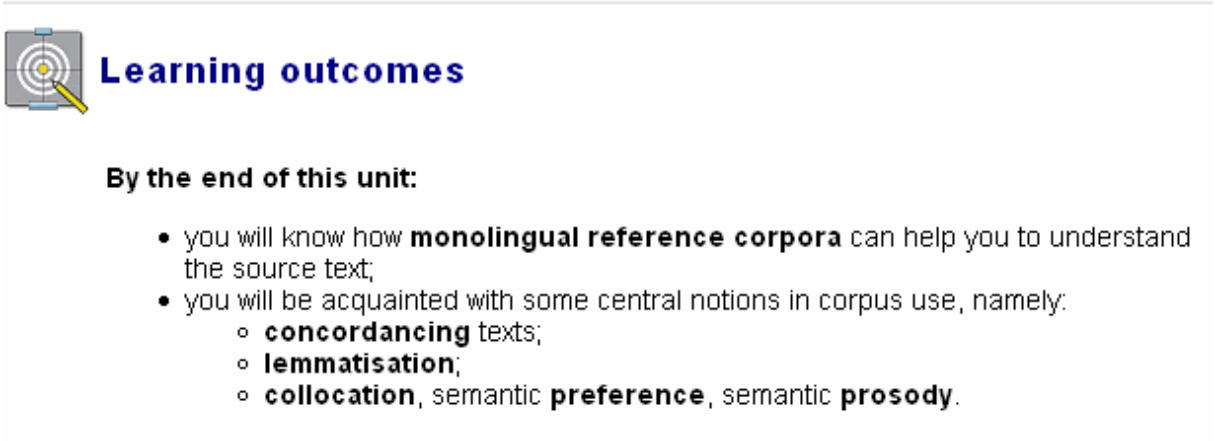

Figure 17: Learning outcomes of a unit within the course on Corpora for Translation

c) Choose the **Duration** iDevice with the Clock icon and indicate the duration of the unit in the title.

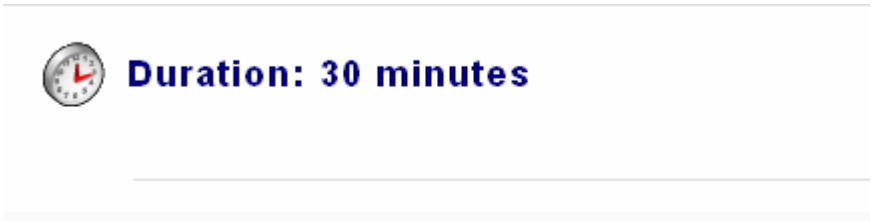

Figure 18: Duration of a unit within the course on Corpora for Translation

4.2.2 Content

Each unit should contain a mixture of learning content and learning events.

Learning content may consist of:

- Explanations

- Mainly conventional academic content
- **Free Text** iDevice is suitable like in the example below

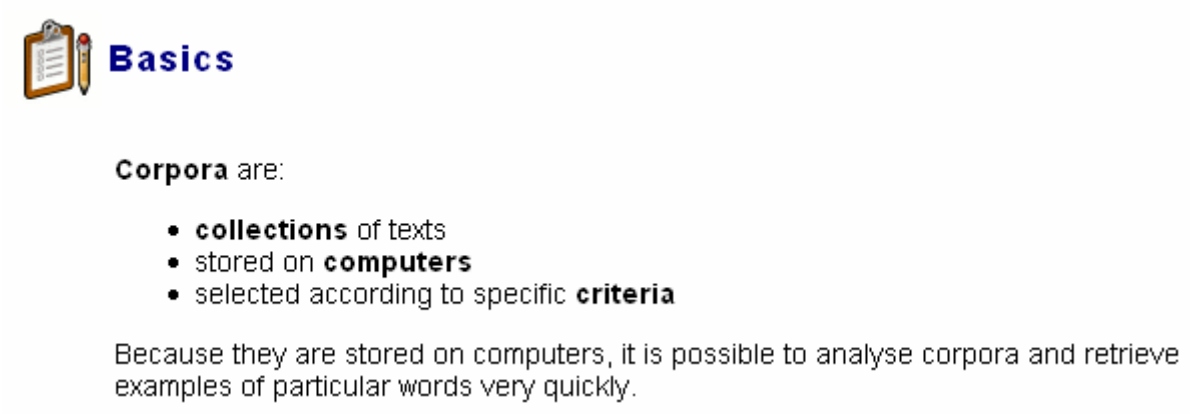

Figure 19: Explanations in a unit within the course on Corpora for Translation

- Instructions
  - List of subsequent tasks
  - **Instructions** iDevice is suitable like in the figure below

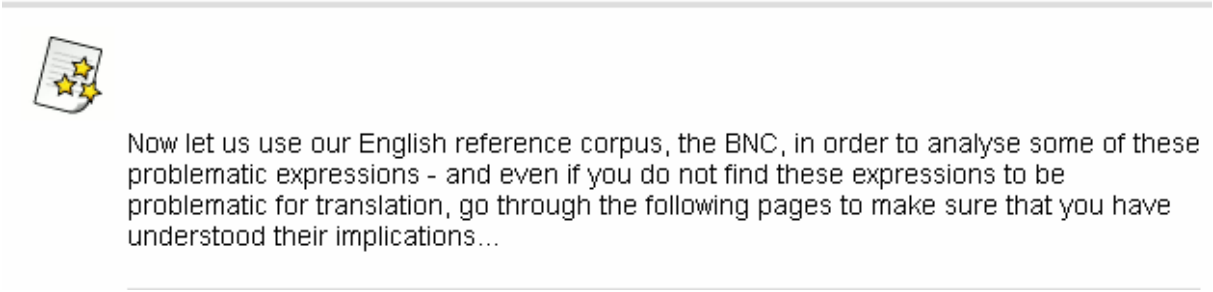

Figure 20: Instructions in a unit within the course on Corpora for Translation

- Demonstrations
  - Interactive presentation with Flash objects
  - **Flash Movie** or **Flash with Text** iDevices may be useful
  - Common title, such as “Let's discover...”

The figure below is a demonstration on Working with TM unit from the MeLLANGE Translation Memory course. The course developer used the Flash movie and Flash with text iDevices to create this demonstration.

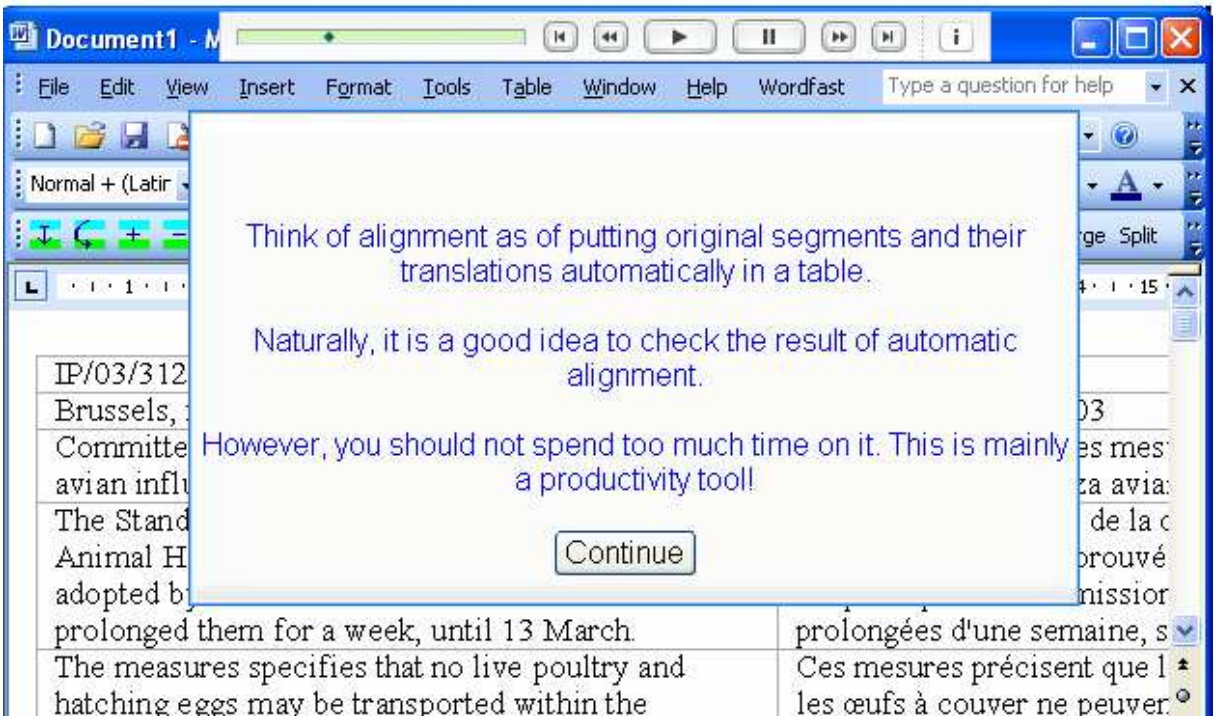

Figure 21: Demonstration in a unit within the course on Translation Memory

- Reading references
  - Additional information
  - **Reading Activity** or **External Web Site** iDevices are suitable
  - Common title, such as “Suggested reading...” like the example below where the learners are given a list of books that deal with the corpus use. The Suggested reading resource is placed outside the learning content units at the end of the sections of the courses.

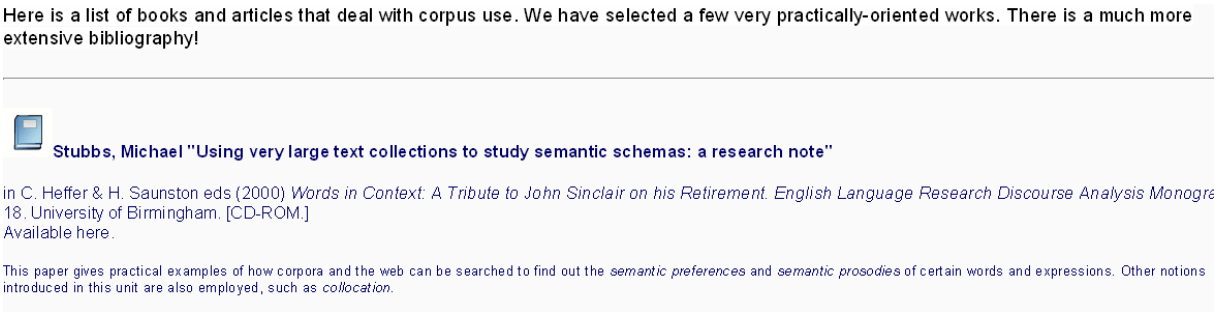

Figure 22: Suggested reading within the course on Corpora for Translation

Learning events may consist of:

- Exercises

- e.g. questionnaires or quizzes
- May be used as transitions between two lessons
- Various iDevices can be used such as: **Close Activity**, **Multi-Choice Question**, **Reflection**, **SCORM Quiz** and **True-False Question**
- Common title, such as “Test yourself”

The example below is a SCORM quiz exercise. This exercise is placed within the SCORM unit and it is used to make the transition between subtopics in a unit. The exercise is a True-False Question. Every time the learner answers a question he/ she is given feedback on the answer provided and the correct answer.

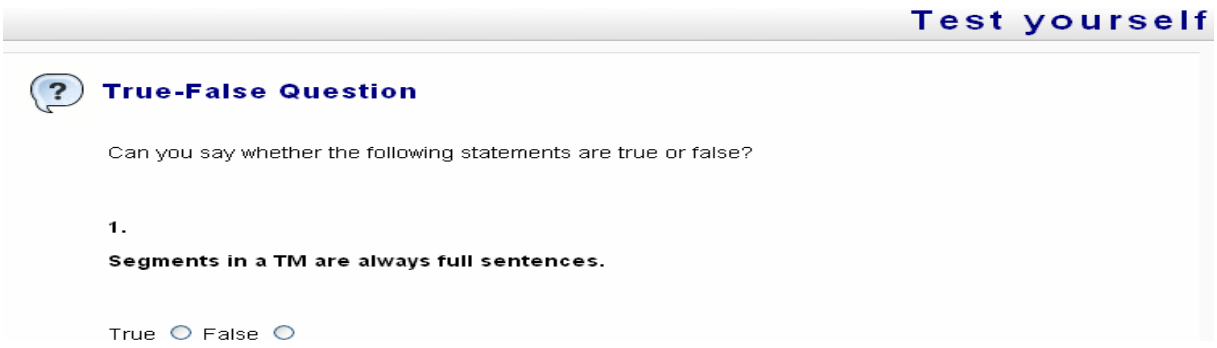

Figure 23: SCORM quiz in a unit within the course on Translation Memory

- Practice without help
  - The **Assignment** iDevice could be used
  - Common title, such as “Now it's your turn”
- Practice with help
  - The **Case Study** or **Instructions** iDevices could be used
  - Common title, such as “Let's practice”

The example below is a case study in the course on Corpora for Translation. Case studies are part of the SCORM unit and they are used in order to make the learner practice new knowledge being helped all along the exercise.

Figure 24: Case study in a unit within the course on Corpora for Translation

4.2.3 Transitions

Learning events can serve as transitions between two academic lessons in order to make sure that the learners have clearly understood the content of the unit, but you could also use progress summaries.

It is important that a transition is inserted every 5 minutes or after 7 items of information.

To add a summary, choose the **Summary** iDevice and enter the title "Let's summarise so far...". The text of the summary should be presented in a bulleted list with the shortest possible sentences (no more than one idea per bullet). (See e.g. Figure 25)

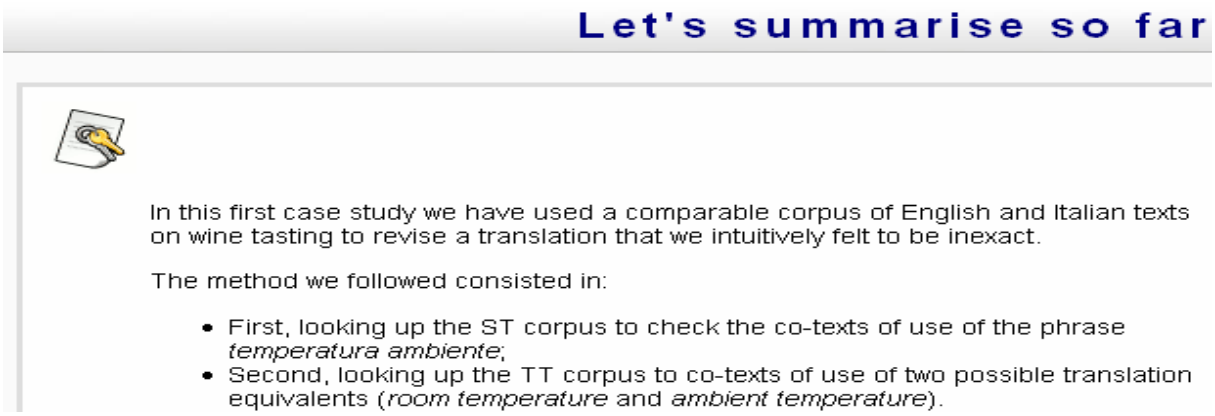

Figure 25: Transitions in a unit within the course on Corpora for Translation

4.2.4 To sum up

Each unit should end with a standard conclusion summarising what the users have just learned and explaining how the content of the unit they have just completed is relevant to the following units.

- Rename the page with the title “Before we move on”**.**
- Choose the **Conclusion** iDevice.
- Enter the label “What you have learned in this unit...”
- Enter the standard text below.
- The related topics could be internal links to related topics (See e.g. Figure 26)

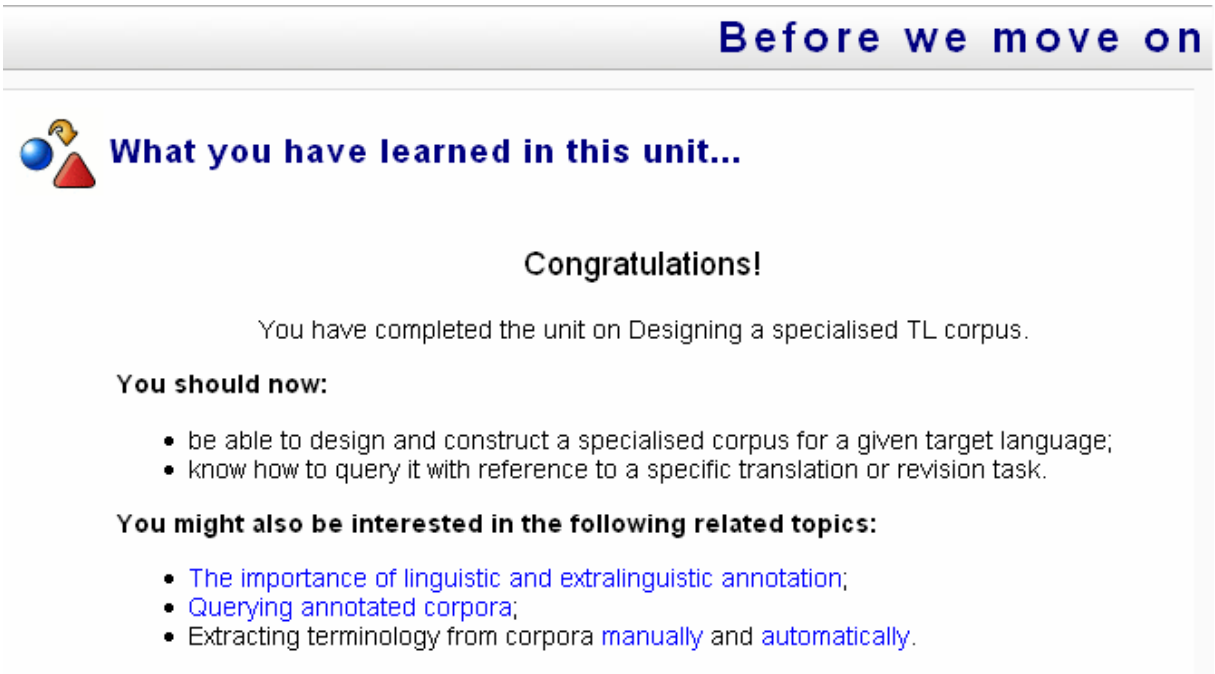

Figure 26: Before we move on page to a unit within the course on Corpora for Translation

4.2.5 Special emphasis

You may also need to highlight some words, such as:

- Glossary terms
- Foreign terms with their translations
- Extended or short quotes
- Technical terms
- Links

With the new stylesheet, all hyperlinks (external links and glossary links) will appear in blue in the text and will be underlined when you move the cursor over them.

- Links to external sites or resources should open in the same window to make sure that the learners won't get lost on the Web. It is also possible to use the **External Web** Site iDevice.
- Links to internal resources may open in another window.

Foreign terms should be in italics with their translation in brackets and technical terms can be highlighted in bold.

"Short quotes should be inserted between quotation marks." Extended quotes or any information needing strong emphasis should be entered in the Quotation iDevice with the references in italics and right-aligned (See e.g. Figure 27).

Figure 27: Extended quotation within the MeLLANGE courses

5 Summary of best practices

5.1 Course structure

Establishing an adequate course structure can help ensure the effectiveness of the learning programme.

The following section summarises the MeLLANGE recommendations related to content structuring

1. Course introduction page. The course introduction page should contain the following elements :
    - the list of units making up the course
    - the order in which the units must be followed. Course designers must clearly specify if the units making up a course have to be followed in a particular order, or whether the learner is free to complete them in any order.
    - an overview of the course learning objectives

2. Unit content organisation
    - each unit should begin with an introductory page called “Before we start…” where the prerequisites, the learning objects and the duration of the unit are clearly stated.
    - each unit should contain a conclusion page called “Before we move on” which lists the key elements to be remembered.
    - key concepts should be included in an external glossary available at all times to the trainees. Resources activities (suggested reading, additional links) should appear outside the SCORM content at the end of the unit.

5.2 Content organisation

Content is most compelling when it is packaged into focused, single thread topics. The best way of presenting content is by introducing real-life examples that learners can relate to. The content must be presented in a storyline format (with a beginning, middle and end).

Course designers should think of the learner as being likely to lose motivation rapidly. As soon as the learning puts them in a passive/ reading/listening/ watching mode, their attention may temporarily decrease. It is for this reason that the storyboarding efforts have to deal with designing learning content and environments that make learners perform authentic tasks.

Course designers should provide contextual information that the learner can use. Learning comes from being able to apply the newly discovered concepts, so guidance must include how to apply the knowledge to particular situations and circumstances.

The table below presents an example of content organisation within the units. The table contains content types, their description, the usage and the frequency of use within one unit.

Content type	Description	Usage	Frequency of use
motivation	learning objectives	first in each unit	once
summary	summary (text) of unit contents	second in each unit	once
summary	summary (graphic) of unit contents	if possible and useful, third in each unit	once
definition	presentation of definition	as needed	unlimited
content	presentation of contents	as needed	unlimited
information	additional information not relevant for exam	as needed	unlimited
example	presentation of example	as needed	unlimited
self-test	True/false, multiple choice, matching	as needed	unlimited
reference	Used or recommended literature	last in each unit	once

5.3 Interactivity

Interaction with the learner is the key to effective e-learning courses. For this reason, it is a good idea to end each unit with a quiz. This is an excellent way to engage the learners and let them exercise their newfound knowledge, or to revise knowledge at later stages.

Nevertheless, the checkpoint quizzes must provide feedback to the learner by using neutral terms such as “correct” or “incorrect” instead of “no” or “wrong”.

Activities within units should be introduced every 5 minutes or following an average of 7 items of information. No more than 4-5 content plain pages should be included at a time without an activity of some kind.

Each course should contain discovery or comprehension exercises.

Learner engagement, whether asynchronous or synchronous, leads to success. The more the learner responds to questions, engages in chats with facilitators or, better still, with other learners, the greater the chances of success.

5.4 Best practice in presentation

Presentation is another important aspect when designing online courses.

Course designers should use an informal writing style to develop a conversation with the learner; the tone must be supportive and encouraging. This means that course developers should avoid corporate-ese and wordiness when making their points. They should avoid slang and jargon and generally prefer the active to the passive voice. Moreover, sentences and paragraphs should be short.

Course developers should not split words at the end of the lines; they should use hyphenated words at the end of the lines, upper case letters whenever necessary and left-justified text. Headings and fonts should be used consistently and scrolling should also be kept to a minimum.

6 CONCLUSIONS

Best practices in e-learning creation and development is the fruit of three years of shared experience and resources of the MeLLANGE consortium for the creation and development of e-learning material.

This guide will not only help the MeLLANGE consortium develop in the future further efficient and coherent online material, but it will also be of help to institutions that will use the MeLLANGE material in their education programmes. This guide is a road map that will facilitate future work in the creation and development of e-learning programmes as it offers solutions to problems encountered throughout the creation and development of the online MeLLANGE materials.

Moreover, this paper opens research paths in the field as it addresses the problem of traditional learning theories and the teaching models they generate for the online environment. Verifying whether learning theories generate specific teaching models for the online environment is a reality that needs to be confirmed.

7 References

Alexander, B. (2006). Web 2.0 A new wave of teaching and learning? Educause Review, 41(2)

Alexander, S. & McKenzie, J. (1998). *An evaluation of information technology projects for university learning*. Canberra: Committee for University Teaching and Staff Development.

Bélisle, C. (2007) eLearning and intercultural dimensions of learning theories and teaching models, Paper submitted to Framework for eContent evaluation project

Bertrun, M. (2007). What's in a Name for your LMS? *The eLearning Guild's solutions, Practical applications of technology for learning eMagazine*, July

Gagné, R.M. (1985). *The conditions of learning and theory of instruction* (4th Ed.). New York: Holt, Rinehart and Winston.

Loveless, A (1995). *The Role of I.T.: Practical Issues for the Primary Teacher.* London: Cassell.

Mandinach B.E. (2005) The development of effective evaluation methods for e-learning. A concept paper and action plan. *Teachers College Record* , 107 (8),1814-1836.

Massy, J. (2002). Quality and eLearning in Europe, Survey report, Bizmedia.

McLoughlin, C.& Luca, J. (2001). *Quality in online delivery: What does it mean for assessment in e-Learning environments?,* The University of New England and the Edith Conan University, Australia

Pulichino, J. (2005). Current trends in e-learning research. *The E-learning Guild Research*, March

Rovai, A. P. (2002). A preliminary look at the structural differences of higher education classroom communities in traditional and ALN courses. *Journal of Asynchnronous Learning Networks, 6*(1), 41-56.

Rosenberg, M (2006). *Beyond E-Learning: Approaches and Technologies to Enhance Organizational Knowledge, Learning and Performance,* New York, John Wiley& Son Inc.

Internet pages:

http://en.wikipedia.org/wiki/Moodle
h
http://ltsc.ieee.org/wg12/

http://www.halfbakedsoftware.com/

http://www.exelearning.org/

www.elearninguru.com

http://www.elearningguild.com/

The official MeLLANGE sites :

http://mellange.upf.es/ (working platform)

http://parles.upf.es/moodlercrc/ (dissemination platform)

http://mellange.eila.univ-paris-diderot.fr/index.en.shtml (MeLLANGE official site)

Internet pages of the MeLLANGE courses on Moodle:
http://parles.upf.es/moodlercrc/course/view.php?id=33

http://parles.upf.es/moodlercrc/course/view.php?id=49

http://parles.upf.es/moodlercrc/course/view.php?id=39

http://parles.upf.es/moodlercrc/course/view.php?id=36

http://parles.upf.es/moodlercrc/course/view.php?id=35

http://parles.upf.es/moodlercrc/course/view.php?id=37

http://parles.upf.es/moodlercrc/course/view.php?id=38

http://parles.upf.es/moodlercrc/course/view.php?id=40

http://parles.upf.es/moodlercrc/course/view.php?id=34

URLs on e-learning framework and creation from the Plone platform

http://mellange.upf.es/wp5/Elearning/course-creation-planning-documents

http://mellange.upf.es/wp5/LOFramework

http://mellange.upf.es/wp5/LOFramework/LOExamples

http://mellange.upf.es/wp5/exe-stylesheet-and-recommendations-for-e-learning-content

http://mellange.upf.es/wp5/Framework

8 Appendices

Page 2: Appendix 1 : Usability questionnaire

The usability questionnaire is an evaluation questionnaire placed at the end of each section of the courses. The learner is encouraged to complete this questionnaire that helped the MeLLANGE consortium to improve the quality and the efficiency of its courses. The questionnaire deals with questions about the presentation of the courses, the navigation within courses, the content of the courses, the overall satisfaction. Learners are given five possible answers.

Page 5 : Appendix 2 : Instructions on how to use the new MeLLANGE standardwhite stylesheet

Appendix 1: Usability questionnaire

USABILITY QUESTIONS

For each item, please click on the response which best represents your judgement:

NA = Non Applicable
1 = Strongly disagree
2 = Disagree
3 = Agree
4 = Strongly agree

Presentation

1.	I liked the colours used.	NA ○	1 ○	2 ○	3 ○	4 ○
2.	There was too much written content.	NA ○	1 ○	2 ○	3 ○	4 ○
3.	The font size was appropriate.	NA ○	1 ○	2 ○	3 ○	4 ○
4.	The design was consistent throughout the unit.	NA ○	1 ○	2 ○	3 ○	4 ○

Navigation

5.	I found navigation within the unit easy.	NA ○	1 ○	2 ○	3 ○	4 ○
6.	It was easy to find the content overview from within the unit.	NA ○	1 ○	2 ○	3 ○	4 ○
7.	I always knew my progress within the unit.	NA ○	1 ○	2 ○	3 ○	4 ○
8.	I could easily find references and additional materials.	NA ○	1 ○	2 ○	3 ○	4 ○
9.	The various parts of the unit were well linked and easy to reach.	NA ○	1 ○	2 ○	3 ○	4 ○

Content

10.	The writing style was easy to understand.	NA ○	1 ○	2 ○	3 ○	4 ○
11.	The text was grammatically correct and free of errors.	NA ○	1 ○	2 ○	3 ○	4 ○
12.	The instructions were clear and sufficient.	NA ○	1 ○	2 ○	3 ○	4 ○
13.	The objectives of the unit were clear to me.	NA ○	1 ○	2 ○	3 ○	4 ○
14.	The activities were well chosen to fulfil the objectives.	NA ○	1 ○	2 ○	3 ○	4 ○
15.	The content was relevant.	NA ○	1 ○	2 ○	3 ○	4 ○
16.	The sequence of activities made sense to me.	NA ○	1 ○	2 ○	3 ○	4 ○
17.	The difficulty level was appropriate for me.	NA ○	1 ○	2 ○	3 ○	4 ○
18.	I found that the unit was too long.	NA ○	1 ○	2 ○	3 ○	4 ○
19.	I found the ratio of reading content to interactive activities good.	NA ○	1 ○	2 ○	3 ○	4 ○
20.	Quizzes helped me assess my level of knowledge.	NA ○	1 ○	2 ○	3 ○	4 ○
21.	Summaries were helpful.	NA ○	1 ○	2 ○	3 ○	4 ○

Overall Satisfaction

22.	I was comfortable using this web-based learning environment.	NA ○	1 ○	2 ○	3 ○	4 ○
23.	I see how it fits with the other available units.	NA ○	1 ○	2 ○	3 ○	4 ○
24.	I will be able to reuse what I learned for my work or studies.	NA ○	1 ○	2 ○	3 ○	4 ○
25.	The approach adopted in this unit is a good way for me to learn this type of content.	NA ○	1 ○	2 ○	3 ○	4 ○
26.	Overall, I am satisfied with this unit.	NA ○	1 ○	2 ○	3 ○	4 ○
27.	I would like to complete other units like this.	NA ○	1 ○	2 ○	3 ○	4 ○

28. Please help us to improve this unit by checking the suggestions below that apply:

- ☐ Provide a better description of the unit
- ☐ Reduce the amount of content
- ☐ Increase the amount of instructions
- ☐ Add more activities
- ☐ Improve unit organisation
- ☐ Clarify the unit objectives
- ☐ Update the content
- ☐ Add more multimedia
- ☐ Add more summaries

Questions for Teachers or Trainers Only

29. Would you incorporate the content of this unit (as implemented here) in your courses? Yes ○ No ○

If yes, would you use it:

- ☐ to support presential (face-to-face) learning
- ☐ in blended learning
- ☐ in autonomous learning

30. What changes (if any) do you think should be made to the content of this unit to be useful for your teaching purposes?

_____
_____
_____
_____

Conclusion for all

31. Do you have other suggestions as to how to use the content of this unit?

_____
_____
_____
_____

32. What was the most enjoyable part of the unit for you?

_____
_____
_____
_____

33. Which part did you like least?

_____
_____
_____
_____

34. Any other suggestions or comments:

_____

Thank you for your patience and your help!

Appendix 2: Instructions on how to use the new MeLLANGE standardwhite stylesheet

Instructions for the new style sheet

You will find in this zip file an eXe file corresponding to the Style Guide for SCORM units which can also be accessed in Moodle at the following address:
http://parles.upf.es/moodlercrc/course/view.php?id=30

You will also find a folder named "style" with new css files and icons.

I have modified the css files in order to adapt the standardwhite style sheet in eXe to MeLLANGE. I have also created a few iDevices, such as Assignments, Conclusion, Duration, Extended Quotes, Instructions, Learning Outcomes, Prerequisites and Summary.

In order to apply the new style sheet, follow the instructions below:

1. Copy the content of the style folder in Program Files\exe\style.
2. Open your eXe application, and open the file called Style_Guide_for_scorm_unit.elp.
3. Be sure to select the standardwhite style.
4. You should have access to the new iDevices.