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Del3.1: Module specifications

University of Deusto

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1 Introduction

Designed discussion document will be a manual for developers of online learning materials such as learning modules or training courses. For this purpose the organized during WP1 e-surveys for different survey target groups was analyzed. Before the creation of questionnaire of e-survey different sources and results of the similar surveys were study.

Based on the analysis and the conceptual design of the education approach (WP1) the specification of the modules will be proposed. In this document the learning materials developers will find the learning/training structure – list of learning modules topics, storyboard or structure of the learning modules and training courses, helpful general description of the structure of the online courses, their learning objectives, and sources; as well as technical specifications and steps that the ICo-op partners have to follow for the development of their E-learning content. The provided design will present:

- possible key scenario of the learning modules;
- the model of training program in order to enhance teachers' skills regarding the e-learning,
- the description of the remote laboratories and ICT collaboration/learning tools; etc.

It will include a description and explanation of each topic.

The MOODLE is LMS that was selected and approved for the development of the Learning Content on the proposal stage.

2 Planning your course: Online Teaching and Learning

The instruction methods of contemporary online teaching are varied. For any online and off-line courses there are limitless combinations of presentation information, explanation, discussion, student practice and assignments, evaluation and assessment. Combining pedagogical approaches with contemporary ICT tools will make teaching and learning an exciting and influencing experience.

Ideally, the design of a course should customize the students' experience to meet their goals and fit their personal learning styles. Leonard and DeLacey provided two observations from an Adult Learning Workshop¹:

- (1) students who already know the power of a classroom experience will not easily abandon that model for something new;
- (2) because humans have "certain, predictable preferences and capabilities in learning," some principles of learning span different academic methods.

Both of these statements should be keep in mind when designing enhanced, blended or fully-online courses.

¹ Leonard, D. and DeLacey, B. Designing Hybrid OnLine/In-Class Learning Programs for Adults. c.2002; <http://www.hbs.edu/research/facpubs/workingpapers/papers2/0203/03-036.pdf> (accessed October 15, 2013)

Based on the existing research and literature analysis, Leonard and DeLacey offered seven main and yet simple ideas of integration of online courses into content design:

- **Learning is a social activity:** group activities and collaboration is effective learning tool because of the basic human nature beings as social creatures.
- **Integrate learning into life:** making connections to a student's work or life outside the classroom is critical because it provides a context in which the acquired knowledge can be used.
- **Enable learning by doing:** practice is the best way to gain mastery of a subject or concept.
- **Encourage learning by discovery:** research indicates that people retain information longer when they are given the opportunity to realize ideas and solutions from their own understanding.
- **Remember that individuals have different “mental receptors for material”:** understanding of new material depends on the student’s knowledge and backgrounds. This can both help and hinder learning, and teacher and content developer need to be aware of this fact when delivering material.
- **Make it fun:** students who are engaged and involved are obviously more open to the learning experience.
- **Build in assessment, but remember that it impossible to measure learning:** quantitative assessment becomes more difficult with increased content complexity. Also, some learning may take time to digest and is not accurately measurable within the temporal course.

2.1 Learning Styles

There is different manner how people learn and get information. The development of online course should be focused on involvement of the "whole brain" into learning, including intuition, sensing, imagination as well as analysis, reason and sequential problem solving. In this case this course will reach a greater portion of students with various learning styles. The main learning Styles are presented in the table1. It is clear that each learner design own learning style that usually is a mix of several learning styles.

Table 1: Learning Styles ²

LEARNING STYLE	CHARACTERISTICS OF STUDENTS	STRATEGIES FOR INSTRUCTORS
Active	"Let's try it"; sitting through lectures is difficult; likes to work in groups	Discussions, problem-solving activities; students retain information better when doing something with it
Reflective	"Let's think about it"; likes to work alone; lectures are difficult if not given time to 'digest' the information	Provide time to think about the material, not just read & memorize; write summaries, devise questions and possible applications of the content

² <http://www4.ncsu.edu/unity/lockers/users/f/felder/public/ILSdir/styles.htm> (accessed October15, 2013)

Sensing	Likes learning facts and using established methods, dislikes surprises; difficulty with abstract, theoretical material; good with details, memorizing fact and hands-on work	Establish connection from material to the real world with examples of concepts and procedures, practical applications
Intuitive	Discovers possibilities and relationships; likes innovation, good at grasping new concepts; works quickly	Interpretations and theories which connect facts will help in learning; provide time to read questions thoroughly and recheck results
Visual	Learns best from what is seen; a large percentage of the population are visual learners	Incorporate meaningful pictures, diagrams, charts, timelines, video, demonstrations whenever possible; concept maps are good for listing key points and demonstrating relationships and can be color-coded
Verbal	Learns best from the use of words	Summarize or outline content verbally so that students can transcribe in their own words; working through ideas in groups can also be effective
Sequential	Learn best in logical steps; linear format	Break material down into smaller logical chunks; give overviews of material before getting into the content specifically
Global	Digests material in leaps and bounds; tends to look at the big picture and tries to make connections to prior knowledge	Provide overviews of material before getting into specifics; show how topics are related to other relevant course material or knowledge students may have from previous experiences

Another way to design instruction is looking, assuming on learning as a physical approach that students may take to learning (Table2).

Table 2: Dominant Learning Styles³

	VISUAL (ABOUT 65% OF THE POPULATION)	AUDITORY (ABOUT 30% OF THE POPULATION)	KINESTHETIC (ABOUT 5% OF THE POPULATION)
Characteristic	Visual learners need to see what they are learning	Auditory learners need to hear when they are learning	Kinesthetic learners need to move around while learning

³ <http://www.ldpride.net/learningstyles.MI.htm> (accessed October 15, 2013)

Learn by	Watching	Listening	Doing
Usually enjoy	Reading	Discussing	Being physically involved
Instructors should use for emphasis	Charts, bold colors and patterns, outlines	Key ideas through voice inflections, tones	Analogies, anecdotes, examples
Instructor should use for reinforcement	Writing notes, concept maps, graphics	Speaking aloud	Writing on flip charts and simulating tasks
Action words	See, look, draw	Hear, say, speak	Feel, do, demonstrate

Traditionally, instructional methods tend to favor verbal-linguistic and logical-mathematical intelligences, and don't focus on the arts, self-awareness, communication and physical education. The Table 3 demonstrates the main learner's types and their methods to learn subjects matter.

Table 3: Dominant Types of Learner

TYPE OF LEARNER	LIKES TO	IS GOOD AT	IS BEST AT
Verbal/Linguistic -- the ability to use words and language <i>Word Player</i>	Read Write Tell Stories	Memorizing Names, places, trivia, dates	Saying, hearing and seeing words
Logical/Mathematical --The capacity for inductive and deductive thinking and reasoning, as well as the use of numbers and the recognition of abstract patterns <i>Questioner</i>	Experiments Works with numbers Explores patterns	Math, logic, reasoning, & problem solving	Categorizing, classifying, & working with abstract patterns
Visual/Spatial --the ability to visualize objects and spatial dimensions and create internal images and pictures <i>Visualizer</i>	Draw, build, design Create Watch Movies Play with machines	Imagination Sensing Changes Mazes & Puzzles Map reading	Visualizing Dreaming Working with pictures
Musical/Rhythmic --The ability to recognize tonal patterns and sounds, as well as a sensitivity to rhythms and beats <i>Music Lover</i>	Sing, hum Play instruments Listen to music Respond to music	Picking up sounds Noticing rhythms Keeping time Melodies	Rhythm Melody Music
Body/Kinesthetic	Move around	Physical activities	Moving

<p>--The wisdom of the body and the ability to control physical motion <i>Mover</i></p>	<p>Touch and talk Use body language</p>		<p>around Interacting with space Touching</p>
<p>Interpersonal --The capacity for person-to-person communications and relationships <i>Socializer</i></p>	<p>Lots of friends Talk to people Join groups</p>	<p>Understanding people Leading others Organizing Communicating</p>	<p>Sharing Comparing Cooperating Interviewing</p>
<p>Intrapersonal --The spiritual, inner states of being, self-reflection, and awareness <i>Individual</i></p>	<p>Work along Pursue own interests</p>	<p>Understanding self Following instincts Originality Pursuing goals</p>	<p>Working alone Self-paced instruction Individual projects Having own space</p>

As shown in Table 3, employing role playing, musical performance, cooperative learning, reflection, visualization, storytelling, etc. as well as assessment methods that account for the diversity of intelligences, the learning experience can be adjustable for all students.

Every student has a preferred learning style. Knowing and understanding their learning style helps teachers to deliver materials to students, and students to learn more effectively. Through identifying the learning style of students, the instruction can be more canalize for the demands of the student's needs at the first. At the second, the students will be able to capitalize on their strengths and improve their self-advocacy skills. The students can check their dominant learning style with questionnaires on <http://www.ldpride.net/learning-style-test.html>

2.2 Motivational Feedback in Online Courses

A friendly personalized "*Welcome!*" the moment you log in to a course helps learners feel like the system knows they are there.

A "*Thank You!*" message in an assignment or other activities provides a polite and motivating response.

"Please check your answer," "please rate the usefulness of this page," "really good comment!," "tell the group your opinion" and "watch this video about ..." are examples of different kinds of feedback.

Such feedback is not related directly to learning or to helping the learners' sense of understanding, remembering or performing the ideas to be learned, but it may help with motivation, engagement, and a sense of presence.

2.3 Learning activities to foster interaction

In order to build trustful connection between student and online instructor, it is necessary that student should fill and know that the instructor is approachable and will regularly interact with them.

Online courses can be built on the three types of interaction between the instructor and the students, student to student, and between the students and the content.

Here is provided examples of learning activities that foster the following types of interaction:

- **Instructor-student** (consider for ALL courses): Self-introduction; discussion postings and responses; feedback on project assignments; evidence of one-to-one e-mail communication, etc.
- **Student-content** (consider for ALL courses): Essays, term papers, group projects, etc. based on readings, videos, and other course content; self-assessment exercises; group work products, etc.
- **Student-student** (if appropriate): Self-introduction exercise; group discussion postings; group projects; peer critiques, etc. The degree and type of student-to-student interaction may vary with the discipline and the level of the course.

There are several techniques⁴ to build the learning /training course.

2.4 Training Course Techniques

2.4.1 Ice breakers

Ice breakers serve many purposes, including creating an open and pleasant environment, fostering group familiarity, and encouraging involvement. Examples of online ice breakers include: posting reasons for enrolling in the course, writing brief bios, responding to other students' posts, to discovering interests about classmates, introducing a partner, finding commonalities, and coming up with self-portraits.

2.4.2 Engagement questions

Engagement questions are used to introduce a topic and/or to stimulate thought and discussion. An engagement question may take the form of a short video clip, an intriguing photograph, a case study scenario, or a class opinion poll.

2.4.3 Treasure hunt

A list of questions for students can start the student's exploration of the site or a topic. A treasure hunt can cover key information in the syllabus, technology requirements, subject matter and can even help enrich the course content if trainer or teachers appeal the students collect external resources.

⁴ <http://vudat.msu.edu/teach/enlivening-techniques-and> (accessed October10, 2013)

2.4.4 Embedded questions

Embedded questions, sometime name motivation, allow keeping the students on track what they have just learned, attempt to answer the question, and then receive immediate feedback. The periodic questions incorporated into course content test students' understanding and remind them of the key points of the learning materials. These can be simple surveys of content points covered so far or practice questions to have students quickly apply what they have just learned.

2.4.5 Case studies

Case studies are most applicable to seminar style courses, where the interaction between students and faculty in and out of groups is essential. Case studies can be as short as 5 minutes (mini case studies) or as long as for example, a 3-4 week unit (larger case study). Mini case studies can be used to better illustrate a concept or model, and a larger case study used as a unit itself.

Research has suggested that using a case study format online may benefit when information sources are more easily accessible online, the flexibility of time helps bring out well articulated thoughts, improved quality of information and comprehension, and facilitate group work. Case studies enforce student involvement in using the Web as a resource for their profession, due to their need to find and investigate information as they look for answers and justifications for their decisions.

2.4.6 Laboratory experiments, Simulations and Games

Laboratory experiment, role play and long-term scenario simulations enable students to formulate hypotheses, vary parameters and observe outcomes. Well formulated games teach facts, skills, behaviors, conceptual ideas and theoretical frameworks while making the learning process fun and challenging for the students. Usually this activity needs more effort for integration into curriculum, because of that it is good to plan it in advance.

2.4.7 Learner /Student contribution

The inclusion of student contribution in the class can be translated to online approaches in various ways. They can gather sites and articles to build an online resource center, share news and current events, discuss the topics and links, talk about how the material applies to their lives, and collaborate in teams to research and present summaries of the subject matter.

In order to generate discussion topics teacher / instructor can use discussion forums, surveys and polls of LMS such as Moodle and /or other available communication and collaborative instruments e.g. Facebook, Twitter, etc. Polls can be used to stimulate discussion, assess student attitudes and reflect the makeup of your class. It is possible to generate statistics from a survey or poll, and then share the results with the class.

2.4.8 Role play or debate

Role play or debate is efficient learning tool in face-to-face setting. It is also possible organize for online instruction as well. For this purpose discussion forums can be used. No doubts that structured exercises are easier to participate in and follow than a free-form debate. For example, give each side a time period in which to construct and post a polished argument. Then give each side a time period in which to construct and post a rebuttal. After one or two rounds of rebuttals you can open up the

forum for more free-form responses. Using forums for role play exercises can be an effective way of getting the students to view a situation or concept from a different perspective.

2.5 Student assessment

Student or learner assessment is one of the key issues in education. There are available multiple forms of assessment to evaluate what students have learned from what we are trying to teach them.

Frequent assessment helps students keep track with content requirements.

Assessment can be based on writing an individual paper, preparing a group presentation, class participation, attendance, homework problem sets, exams (essay, short answer, multiple choice, true/false), and so on. Alternatively, when a student performs a task rather than taking a test, it is called performance assessment. Examples of performance assessment include: debating a topic; demonstrating a skill; conducting an experiment and writing the results; doing a project; or compiling a portfolio of work.

Usually the assessment process informs the teacher and the learner about learner progress and at the same time, contributes to the learning process. In theory, good assessment:

- measures learning outcomes in a fair, reliable, accurate way;
- is easy to administer, score, and interpret;
- informs the teacher about student performance and how they are interpreting course experiences;
- results feedback to the learner
- is itself a learning experience

2.5.1 Feedback on assessment

Feedback shows “reaction or response to a particular process or activity and evaluative information”⁵. Because of this it is a very important part of learning.

Assessment and measurement strategies provide feedback to both the student and instructor. Students learn more effectively if they receive frequent, meaningful, and rapid feedback. Feedback may come from the instructor directly, from assignments and assessments which have feedback built into them, or even from other students, such as:

- a discussion assignment;
- writing assignments that require submission of a draft for teacher/instructor or peer comments and suggestions for improvement;
- self- tests and quizzes that include informative feedback with each answer choice;
- interactive games and simulations that have feedback built in.

⁵ <http://dictionary.reference.com/> (accessed October 5, 2013)

Contemporary ICT technology provides automated assessments which provide instant right or wrong feedback. Interactive media provide feedback when they add a visual change, or a sound to accompany an action. The simple technologies provide a feedback that learner knows his/her input has been received. More sophisticated technologies can offer constructive criticism. Although technology can help by gathering and organizing student performances, human involvement is often a necessary part of feedback.

The types of assessments selected and the methods used for submitting assessments should be appropriate for the online learning environment, such as:

- submission of text or media files by email or 'drop box';
- quizzes with time limitations, printing disabled, and other security measures;
- multiple assessments which enable the instructor to become familiar with individual learners' work and which discourage 'proxy cheating'⁶.

2.5.2 Pre-testing

It can be helpful to find out whether the learners meet the basic knowledge and skill levels required to learn your materials. A pre-test is solid tool for this aim. The pre-test can be offered in form of self-assessment and held on prior to the beginning day of class or during the first week of course. Students should get response on their pre-test. Alternatively, the pre-test can be performed prior to each module or topic.

2.5.3 Practice exams

Practice exams and problem set homework are popular with students and trainers in courses. The practice exams allow preparing to the official exam. Technical problems have been worked out, and the student knows what to expect in terms of types of questions. It's important that practice exam questions will be similar to what they will find on their other exams. Learners are very likely to complete a practice exam which parallels the real exam.

2.5.4 Subjective assessment

In subjective assessments include essay tests. Essay tests take longer to answer and they take longer to grade than objective questions and therefore should include a small number of questions, focusing on complex concepts.

2.5.5 Objective assessment

Objective assessments - usually multiple choice, true false, short answer, etc. have correct answers. These are a good tool for testing recall of facts and can be automated. Objective tests assume that there are true answers and assume that all students should learn the same things.

2.5.6 Self-assessment

Self-assessment types of assignments are provided for quick student feedback. Self-assessments:

- help the learner check if they have mastered a topic;
- measure learning progress;

⁶ "proxy cheating" by definition someone other than the student completing and submitting work

- are usually voluntary and may allow multiple attempts;
- inform the learner, but *not the teacher*;
- link with feedback about a performance.

Self-assessment includes: practice quizzes; games, simulations, and other interactive exercises; practice written assignments; peer reviews; true-false questions.

2.5.7 Interactive assessments

Interactive experiences can be designed as spaces where learner can perform a task. These experiences can be graded or not. Interactive software can administer quizzes and give instant, usually fun, right-wrong feedback and perhaps explanations of right answers.

Examples of interactive assessment:

- a simulator that lets learners virtually drive, facing the full range of driving challenges along the way. Simulators can be used both to teach and to test through performance in the simulation.
- students could conduct a virtual or remote experiment rather than an experiment in a physical laboratory
- creation of an online tool, such as a virtual instrument
- a game where the goal is to earn not points but show what was been learned.

Group projects

Group projects are more challenging in a fully online course because the online tools often must handle all collaboration. Students do not necessarily live in the same time zone or even on the same continent, there is no set class meeting time, and they may have vastly different schedules. Some online students do their classwork during the week, others work only on weekends. Some like the idea of meeting in-person with their group, others prefer asynchronous collaboration. A majority prefer not to do group work at all. Some students start and finish projects early (they always turn things in first) and others wait until the last minute. Invariably there will be complaints about group members who are not participating.

In real life many projects are team efforts. There is a great deal of learning value in discussion and collaboration. Tools which can facilitate group collaboration include asynchronous discussion tools for group communication, file sharing to share and revise documents, and chat tools for real-time discussion.

Smaller groups are more manageable. Teams of two are easier to coordinate than larger teams, although some courses organize groups of 5 or 6. It is important to assign carefully the groups based on when they like to work and how they prefer to collaborate. Define clear roles, and include peer review of group participation as part of the grade. You can ask students to keep a log of their process and procedures. Provide a "panic button" for students whose team members have disappeared, so you can help them either decide to work alone or connect with another group.

Proctored exams

One anti-cheating strategy is to require students to arrange for a proctor at a local community college, university or library. The proctor is typically located by the student and approved by the instructor. The proctor checks photoID and monitors the student while they take the exam. Exams are submitted online, or in some cases, printed and faxed by the proctor to the instructor. This can be inconvenient for distant students to arrange and for the instructor to coordinate

Students as audience and peer review

In the classroom, time constraints prevent students from being able to review their projects in detail. It is easy to post project online where everyone can see and check it. The work is thus a public performance, a potential source of pride or embarrassment. It is helpful for other students to see the scope of work produced by others. They may be motivated for the next assignment by seeing other outstanding projects.

Peer review can be an effective learning technique. Taking on the role of judge is a different mode of understanding the goals of an assignment. Here is a form used peer group work evaluation in Charles W. Davidson College of Engineering, San José State University (<http://www.engr.sjsu.edu/nikos/courses/engr10/teamcard.htm>).

Participation

Class participation can be an alternative method of assessing the student. A good way to encourage class participation is to make it part of the overall course grade. Class participation may include answering reflective questions in a course module, taking part in weekly class discussions, providing peer review critiques of fellow students' assignments, or locating and contributing online resources to a class-created knowledgebase.

The quality and quantity of submissions can be used to determine the grade. Some LMSs can track the number of posts a student makes to a discussion forum or live chat.

Other kinds of assessment

Alternative methods of assessment are limited only by your imagination. Consider assigning reflective journals, one minute papers, contributions to digital archives, or portfolios.

2.6 Benefits and Limitation of online teaching and learning

Instructional Benefits

- lessons and activities are often more structured since they must be completed without an "expert in the room"
- the ability to prepare students for the increasingly digital work environment
- present information in multiple ways, in order to address more learning styles

- opportunities for group or individual work through asynchronous and synchronous communication tools
- ability to pretest and assign remedial work
- learning can be engaging and interactive rather than passive
- sound, music, visuals, movement and talking encourages students to participate in the learning process
- multisensory input (visuals, text, sounds, video, etc.) may provide more opportunities for engagement, interest, motivation, and retention

Administrative

- automated grading and online testing
- easy archiving of course materials
- ability to use online course administration tools
- access to course and content is controllable (password protection, date and time access)
- online course administration tools
- more efficient use of brick-and-mortar classrooms by supplementing "seat time" with technology tools

Access

- allows students who are employed full-time to attend courses
- allows students who do not live close to East Lansing to earn credits and degrees from MSU
- may help facilitate the teaching of large enrollment courses
- easy delivery of course materials to users
- ability to expand student learning opportunities
- multi-platform capabilities (Windows, Mac, UNIX, smart phones and other wireless devices)

Innovation

- technology to enhance learning. (online tools such as simulations, graphing calculators, metric converters, virtual labs, search, etc.)
- reuse materials for multiple courses and semesters
- share and collaborate with colleagues
- media such as video, sound, graphics, animation and text are structured in such a way that the audience has control over their presentation
- ability to create more engaging learning opportunities and present materials in different ways

2.7 Limitations of online teaching

Technology

- a student's bandwidth and/or browser limitations may prevent some content from functioning properly
- web technologies are complicated and may fail at inopportune times

Administrative

- instructors will often need to learn new skills sets (pedagogical, technological)
- not all content can be created by just one individual (e.g. simulations)
- new features and functionalities are slow to be added to course management systems

Instructional

- instructional materials need to be developed well in advance of student consumption
- less physical person-to-person interaction
- some content and skills may be extremely difficult to teach online

3 Suggested structure for ICo-op Learning Module

3.1 General Information

1. Title of the course / learning module: Subtitle
2. Target groups
3. Preliminary requirements if they are applied
4. Required minimum hours for finishing the course

3.2 Statement in the course:

course overview including learning objectives and learning outcomes
course syllabus,
orientation / introduction unit

3.3 Structure of the course

3.3.1 General rules:

- try to not go more than three levels deep;
- using a repetitive structure for each part of the module
- the pages containing the course material should be organized in a way that makes navigation easy, simple and consistent as well reduced the amount of work necessary for site maintenance.
- prepare a flowchart showing how the course progresses from start to finish, Including lessons/units, pre-tests, quizzes, course map, help, discussion forums (if necessary), events calendar and any other components of the course.

3.3.2 Typical Course Components

- Welcome to the course
- Syllabus
- Calendar
- Class roster (If necessary for collaborative class activities)
- Course content
- Evaluation within course
- Gradebook (assignment, test, participation)
- Resources
- Help

3.3.3 Content presentation

Below is an example of how content may be structured. Content for this example is set up using weeks schedule. Each week contains the readings/lectures and assignments with completion expected by the end of the week.

Getting started

it includes setting, reports, utilities, submission, topics for final projects etc.

Here can be welcome video of an educator to future students implemented.

How to use a webcam to record video?
(<http://support.google.com/youtube/bin/answer.py?hl=en&answer=57409>)

Start day: January 21, 2014

Deadline for assignment: January 28, 2014

Unit 1: Introduction to remote laboratory: VISIR

Start day: January 28, 2014

Deadline for assignment: February 4, 2014

Unit 2: Direct current (DC) circuits

Start day: February 4, 2014

Deadline for assignment: February 11, 2014

Unit 3: Alternating current (AC) circuits

Start day: February 4, 2014

Deadline for assignment: February 18, 2014

Unit 5: Final Project

Deadline for final project: March 4, 2014

Each Unit shall consist of:

- (1) Theoretical section
- (2) Practical section, including assignment as self-evaluation test, assess quiz, exercises or remote experiments

4 Presentation Options

Text :

Title (Heading 1 Characteristics): Times New Roman, 24 pt, Bold, Font color: #058CCC;

Subtitles (Heading 2 Characteristics): Times New Roman, 18 pt, Bold, Font color: #305367;

Second level subtitles (Heading 3 Characteristics): Times New Roman, 14pt, Font color: #444444

Text of content (Heading 4 Characteristics): Times New Roman, 12 pt; Font color: black;

Image title: Heading 5 Characteristics: Times New Roman, 10 pt, Font color: #333333

The information can be emphasized with any font styles (bold, italic or underline)

Text should be **Aligned Full** or justify for a better display in Moodle

Can be used **Bullets Points** or **unordered list** and **numbered list** or **ordered list**

Tables and pictures should be centered and have a title.

Image:

Format: gif, jpg, jpeg, tiff, png

Resolution : 300px

Video format: mp3, avi, mpeg4 (get more information in “A Guide to Understanding Video Containers & Codecs” <http://library.rice.edu/services/dmc/guides/video/VideoFormatsGuide.pdf>)

For **references** please use Chicago Style (Citation machine <http://citationmachine.net/index2.php>)

5 Moodle – Learning Management System

5.1 History

Moodle (Modular Object-Oriented Dynamic Learning Environment) is an open source e-learning software platform, also known as a Course Management System (CMS), Learning Management System (LMS), or Virtual Learning Environment (VLE).

The pedagogical approach of Moodle includes a constructivist and social constructionist approach to education, emphasizing that learners can contribute to the educational experience.

The first version of Moodle was released on 20 August 2002. Since there, platform became well known tool for development of e-learning courses in formal education institutions such as university,

colleges, schools, and training organization. Moodle was originally developed by Martin Dougiamas for his PhD to help educators create online courses with a focus on interaction and collaborative content. Moreover, Moodle is in continual development and evolution by open network – Moodle community. For now this community involves over one million registered users who share ideas, code, information and free support.

5.2 Features

Moodle support typical of an e-learning platform features such as:

- ✘ Assignment submission
- ✘ Discussion forum
- ✘ Files download
- ✘ Grading
- ✘ Moodle instant messages
- ✘ Online calendar
- ✘ Online news and announcement (College and course level)
- ✘ Online quiz
- ✘ Wiki
- ✘ SCORM

Additional to these basic features, original innovations like its filtering system present an asset in the characteristic list of the platform. Because of Moodle components the platform can be used in many types of environments such as education, training and development, and business settings.

The functionality of Moodle can be extended by creating new plugins and modules. Moodle's infrastructure supports many types of plugins such as:

- ✘ activities (including word and math games)
- ✘ resource types
- ✘ question types (multiple choice, true and false, fill in the blank, etc)
- ✘ data field types (for the database activity)
- ✘ graphical themes
- ✘ learning environment structure
- ✘ social and communication tools
- ✘ authentication methods (can require username and password accessibility)
- ✘ enrollment methods
- ✘ content filters

Many freely-available third-party Moodle plugins are feasible for usage⁷.

5.3 Interoperability

Moodle runs without modification on Unix, Linux, FreeBSD, Windows, Mac OS X, NetWare and any other systems that support PHP and a database, including most webhost providers.

⁷ <http://moodle.org/plugins/>

Moodle supports MySQL, PostgreSQL and MS SQL 2005 and Oracle *databases*. Other *databases* may also work with Moodle.

PHP 5.3.2 and database MySQL 5.0.25 execute in the *OLAREX project*.

E-learning systems can have many dimensions of interoperability. Moodle interoperability features include:

- ✘ authentication, using LDAP, Shibboleth, or various other standard methods (e.g. IMAP)
- ✘ enrolment, using IMS Enterprise among other standard methods, or by direct interaction with an external database
- ✘ quizzes and quiz questions, allowing import/export in a number of formats: GIFT (Moodle's own format), IMS QTI, XML and XHTML (*NB although export works very well, import is currently not complete*). Moodle provides various types of questions - Calculated, Description, Essay, Matching, Embedded Answers, Multiple Choice, Short Answer, Numerical, Random Short-Answer Matching, True/False.
- ✘ resources, using IMS Content Packaging, SCORM, AICC (CBT), LAMS
- ✘ integration with other Content Management Systems such as Drupal, Joomla, and Postnuke (via third-party extensions)
- ✘ syndication, using RSS or Atom newsfeeds - external newsfeeds can be displayed in a course, and forums, blogs, and other features can be made available to others as newsfeeds.

Moodle also has features for importing quizzes or entire courses from Blackboard and WebCT. Moreover, some utilities, e.g. Reteach, helps convert Blackboard courses to a Moodle-friendly format.

6 Personal Learning Environment

Personal Learning Environment (PLE) puts the individual learner at the center of process of learning and helps learners to control and manage their own learning activity. This environment allows learners to

- ✘ set their own learning goals,
- ✘ manage learning: content and process,
- ✘ communicate with others in the process of learning,

and through developing environment to achieve learning goals.

The PLE concept includes integration of formal and informal learning sets into a single experience, the use of social networks that can cross institutional boundaries, and the use of networking protocols (Peer-to-Peer, web services, and syndication) to connect a range of resources and systems within a personally-managed space.

Technically, the PLE represents the integration of a number of "Web 2.0" technologies like blogs, Wikis, RSS feeds, Twitter, Facebook, etc.— around the independent learner. The PLE may be described: "... one node in a web of content, connected to other nodes and content creation services

used by other students. It becomes, not an institutional or corporate application, but a personal learning center, where content is reused and remixed according to the student's own needs and interests. It becomes, indeed, not a single application, but a collection of interoperating applications—an environment rather than a system"⁸.



Figure 1: Personalised Learning Environment designed by Julie Collareda⁹

⁸ S.Downes, *E-Learning 2.0*, eLearn Magazine, Oct., 2005 (access Oct 2013
<http://elearnmag.acm.org/featured.cfm?aid=1104968>)

⁹ <http://juliecollareda.wikispaces.com/Creating+your+own+personal+learning+environment>