A Review of Teaching Methods for Life-Long Learning

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Abstract. In the paper, there were analyzed six popular teaching methods – case method, enquiry-based learning, spiral learning, problem-based learning, project-organized learning, and b-learning – for the purpose of selecting and providing relevant teaching methods for LLL courses. There were evaluated the usefulness of each teaching method for LLL courses and identified their relevance for life-long learning. The paper provides some recommendation on teaching methods choosing.

Keywords. Teaching method, LLL course, case method, enquiry-based learning, spiral learning, problem-based learning, project-organized learning, b-learning

Key Terms. Academia, Didactics, TeachingMethodology

1 Introduction

When we mention the life-long learning (LLL), we say first the learning of adult students. To base on the experience of students there are recommended to provide an individual trajectory of learning, adaptive learning strategy and design, and so on. However, there are one more means for adaptation, which is important to enhance students' activity and to discover their abilities. They are teaching methods for the course.

The purpose of LLL teaching methods is to provide relevant teaching methods for LLL courses, which will enhance their usefulness to support the development of continuing and further education, meet the demands of the changing labor market and hence contribute to social and economic growth in the country.

The purpose of this paper is an exploration of existing teaching methods on requirements of LLL courses to formulate recommendations concerning teaching methods choice.

The rest of the paper is organized as follows. Section 2 briefly describes the most popular and known teaching methods. Section 3 presents some recommendation for choosing teaching methods and preparing the courses based on them.

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2 Teaching Methods Relevant for LLL

In the life-long learning, there have been exploiting many different teaching methods fitted to the adult students. In this paper, we analyze the methods, which are the most popular now.

2.1 Case Method

A case method is a form of instructor-guided, discussion-based learning. It introduces complex and often ambiguous real-world scenarios (cases) into the classroom, typically through a case study with a protagonist facing an important decision. Since it presents authentic cases and real world problems, case method fully complies with LLL courses and supports the development of some essential skills for life, like communication, social, interpersonal, higher-level reasoning, problem-solving, and decision-making skills. The case method shifts instructor-centred model of education towards a participant-centred one in which students play a lead role in their own and each other's learning.

Teaching with cases is a very suitable method to use when lectures are the primary teaching form in a course. Making the students' work with cases in a structured way contributes to activating them. Thereby they are made to use their knowledge in the field of subject actively and work actively with the present course content. The method was developed at Harvard Business School, and it is very well-known [1].

In this method, the construction and formulation of the cases are crucial. They must cover the topics of the lecture, and they must provide a suitable challenge for the students. It may be a real life problem or a constructed task the students must work with and discuss.

Usually, in the courses practiced case method, the individual oral examination is used as an assessment at the end of the course.

A case method is practiced in onsite teaching as well as in online one. The resources needed to provide the course with encapsulated cases are listed in Table 1.

Table 1. Resources required for case method

Onsite Teaching & Learning	Online Teaching & Learning
Working spaces for group work of students	Online repository to make case descriptions available
Classroom for plenum sessions, preferably with student seats in half-circles	Online communication system to allow for Q&As to/from teacher
Equipment for video recordings of discussions	Virtual forum for students' case discussions
	Virtual forum for class discussions

2.2 Enquiry-Based Learning

The aim of this method is to give the students a life-long insight into research as a method to create new knowledge and learning. Enquiry-based learning is a student-

centred approach, which focuses on the development of students' higher-order thinking skills. This approach implies a complicated process where students formulate questions, investigate to find answers, build new understandings, meanings, and knowledge, and then communicate their learnings to others [2].

Enquiry-based learning can enhance the effectiveness of LLL courses since it emphasizes the importance of developing and fostering enquiring minds and attitudes in students; it enables them to continue the quest for knowledge throughout life.

In enquiry-based learning, the students are responsible for defining the central parts in the curricula the teacher has chosen as a subject for the course. They must find, evaluate, and use the sources of information available for the subject in question. The students start with one fundamental question, and while they are expanding their knowledge, the teacher inspires them to formulate and answer more detailed questions.

A strong emphasis is placed on reporting achieved results and documentation of the progress in the students' learning. The students themselves do this. The students conduct an evaluation of the results through self- and peer-assessment. Active involving students to knowledge mining process is a central part of the method.

To evaluate students work there are often used the learning portfolios, project reports with accurate descriptions of the problem, work process, results and solutions, and traditional examinations.

The resources needed to organize the onsite or online enquiry-based learning are listed in Table 2.

Table 2. Resources required for enquiry-based learning

Onsite Teaching & Learning	Online Teaching & Learning
Working spaces for group work of students	Online databases and search engines for finding and research information on the topic
Classroom for plenum sessions, preferably with student seats in circles or half-circles	Online communication system to allow Q&As to/from teacher
Equipment for presentations	Virtual forum for students' discussions
	Virtual forum for class discussions

2.3 Spiral Learning

The fundamental principle of the spiral learning is to minimize course risk by breaking a course into smaller topics. Students meet the same topics more than once during the course, with each encounter increasing in complexity and reinforcing previous learning. Spiral learning can be considered as one of the important and relevant method for LLL course.

The teaching sequence is divided into several (2-4) sections or "windings" in a spiral. In each winding the course subject is approached both from the top (overview) and bottom (details).

In the first winding, the students work with the course subject in a very basic way. Elements from all of the course topics are included, and a general overview of the course subject is given – i.e. the topics are not dealt with one at a time like the chapters of a typical textbook. The students are given group assignments to solve based on their present knowledge – maybe only in a qualitative way the first time depending on the subject.

In the next windings, the students work with the subject in increasingly advanced ways. It might be the same problem they are given in each winding, but the solution becomes more and more sophisticated and at a higher level of competency. In the last winding, the final level of competence (learning objectives) is reached.

Usually, the progress assessment is based on the assignments with teacher's feedback and a final evaluation.

The resources needed to provide a course on spiral learning method are listed in Table 3.

Table 3. Resources required for spiral learning

Onsite Teaching & Learning	Online Teaching & Learning
Working spaces for group or individual work of students	Online communication system to allow Q&As to/from teacher
Classroom for plenum sessions	Online for searching the relevant information
Libraries for getting the relevant information	Virtual forum for students discussions
Equipment for presentations	Virtual forum for class discussions

2.4 Problem-Based Learning

Problem-based learning is an active learning approach in which individuals gain knowledge and skills through problem-solving. Students learn the content as they try to address the problem. Students learn both thinking strategies and domain knowledge. The aim of problem-based learning is to develop the students' flexible knowledge, effective problem-solving skills, self-directed learning ability, effective collaboration skills and intrinsic motivation [4]. This teaching method fully complies with LLL demands since it provides a model for life-long learning, and supports building skills and abilities that are so valuable for today's world of constant change.

The leading principle of problem-based learning is that the students learn by relating their knowledge to a given problem or case which the teacher prepares. Through dialogue and discussions, the students in the groups try to solve the problem by using their previous knowledge and the new knowledge in the curricula of the course. A course typically starts with an overview of the course and the learning objectives. Then follows an introduction to the first problem the students are going to work with. The students meet in their groups and work with the problem based on a very structured method, repeated every time the teams meet.

Formulating the problems is crucial for course success. The problems should combine elements from all topics of the course, i.e. they do not deal with one topic at a time like the chapters of a typical textbook.

The progress assessment is based on the individual assessment of learning outcome typically using the triple jump evaluation methodology.

The resources needed to provide problem-based learning are listed in Table 4.

Table 4. Resources required for problem-based learning

Onsite Teaching & Learning	Online Teaching & Learning
Working spaces for group work of students	Online databases and search engines for finding and research information on the topic
Classroom for plenum sessions	Online communication system to allow for Q&As to/from teacher
Equipment for presenting the group work	Virtual forum for students to discuss the assigned case/problem, to provide review and feedback
Laboratories for group experiments	Virtual forum for class discussions
Library for researching relevant information to resolve the problem.	Online management system for group negotiation and planning

2.5 Project-Organised Learning

The idea behind project-based learning is that projects have a multidisciplinary character in which groups of students work while developing life-long learning skills. With a project organized curriculum, each course is structured around the big project. The course is planned around a project case covering all core elements in the course [5].

The use of project-organized learning has several benefits for LLL courses. It can be used with students of all ages. It can be flexible: does not necessarily mean working in a traditional classroom setting, and students can meet, interact and work wherever and whenever it is convenient for them. It provides some key (social, communication, interpersonal, decision-making, problem-solving, leadership, trust-building) skills for individuals to meet the demands of today's constantly changing world.

The objective is to solve the problem, i.e. the outcome includes a product. The students groups are working independently, doing their planning and taking charge of their process. Lectures can be given as a supplement to the group work and to support the course theme.

Outcome and process are assessed based on group project reports with oral presentations and some individual assessment for individual grading.

The resources needed to provide project-organizes learning are listed in Table 5.

Table 5. Resources required for project-organized learning

Onsite Teaching & Learning	Online Teaching & Learning
Working spaces for group work of students	Online repository for upload project descriptions, reports, and presentations
Classroom for plenum sessions, preferably with student seats in half-circles	Online communication system to allow for Q&As to/from teacher
Equipment for making PowerPoint presentation about the project	Virtual forum for students projects discussions
Labs for conducting experiments	Virtual forum for class discussions
Libraries for researching relevant information to fulfill the project work	Online management system for planning and negotiating project work

2.6 b- and e-Learning

Blended learning (b-learning) focuses on offering students choices about when, where and how they learn. It provides opportunities to improve the student knowledge and skills through flexibility in time, space, place (physical, virtual, on-campus, off-campus), mode of study (print-based, face-to-face, blended, online), teaching approach (collaborative, independent), forms of assessment and staffing [6]. This way of organizing university teaching goes far beyond the traditional way of thinking about teaching and learning. e-Learning is a tool often used in b-learning because of its independence of time and place.

Due to its flexible nature b-learning meets the demands of LLL courses and especially needs of adult students. Emphasis is on meeting students' needs, recognizing that all students have unique, complex needs, and this method gives students greater influence on what they need to learn, where, when and how. The method provides greater flexibility for students when it comes to where and when to study because of mix on-campus teaching and distant learning (at the workplace or home), and offer more flexible forms of access, entry, and exit.

In b-learning, very often on-line test are used as an assignment, but more traditional assessment methods can be utilized depending on the context in the course.

The resources needed to provide b-learning are listed in Table 6.

3 Recommendation on Teaching Methods Choice

Because of all teaching methods listed above are analyzed in the context of LLL, we should point their focus (except case method) on the learning to learn, and to take responsibility for own learning.

Case method could be recommended for courses which outcome is learning to deal with complex problems and problem-solving in general. The teacher should take the role of expert and facilitator of the class discussions. He/she organizes the work of the individuals or small group with cases – small, well-defined real-world problems.

Table 6. Resources required for b-learning

Onsite Teaching & Learning	Online Teaching & Learning
Working spaces for group work of students	Online repository to make instructional materials available
Classroom for plenum sessions	Online communication system to allow Q&As to/from teacher
Equipment for video conferencing; making presentations; using audio and video study materials	Virtual forum for students discussions Virtual forum for class discussions
Libraries and Labs for conducting research and experiments	Online system for the web-conferencing; web-casting
Alternative format learning resources and specialized equipment for students with disabilities (like, Braille, audio, and e-text for blind and visually impaired students)	Online systems to provide access to instructional materials for students with disabilities

If the outcome of the course is learning to learn, spiral learning and b-learning could be recommended. Spiral learning needs close involving the teacher as an expert and tutor. He/she monitors the work of medium students groups on authentic cases constructed with progression.

In b-learning teacher gets very special duties of student learning facilitator and consultant. We should point that b-learning in the context of LLL is the tool for supporting other teaching methods rather than the separate teaching method. Also, b-learning is the best means to support the individual learning trajectory.

Other three methods are oriented not only on learning to learn and learning to deal with problems but also on getting to know about information resources on the subject. Enquiry-based learning fits the last outcome the most. It requests teacher takes the role of expert, prepares real, ill-defined and open-ended, research-driven case, and supervises the work of small students groups.

Problem-based learning can be recommended as “easier” for teacher alternative of enquire-based learning. The teacher should take the role of facilitator of the group work and guide to the learning process. He/she provides sources of information and structure relevant problems and planning for progression towards the learning objectives. There is no need in one research-driven case for the course. The set of small cases covered the core elements of the course are also suitable. The cases should be realistic and interdisciplinary, ill-defined and open to brainstorms and elaboration with knowledge. Students work on them in large groups.

Project-organized learning can be recommended for courses built around one large, real-life, ill-defined and open case. Students are working on the case in permanent, medium-size groups. This method is the most demanding to the teacher, who works as a tutor (process and group facilitator) and as a consultant (expert).

4 Conclusion

The main point taken into account while developing the LLL course is the elaboration of new students' knowledge and skills based on their previous experience. It requires using of active teaching methods that enhance the students' to work actively on mining new knowledge and training new skills.

On this needs we explored the most known active teaching methods on requirements of LLL courses and formulated recommendations concerning teaching methods choice. Our analysis has a significant restriction: we analyzed the teaching methods separately. While developing the LLL course, each teacher should use different methods to make their course more fruitful.

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