
THE E-LEARNING PLATFORM AS A BASIS FOR DIDACTICAL DIVERSIFICATION OF TRAINING

Ivan Merdzhanov

Medical University – Varna, Bulgaria, merdzhanov@gmail.com

Abstract: The e-learning platform is gradually becoming an integral part of the electronic campus of any modern higher education institution and provides teachers with access to tools that not only complement traditional forms of training but also have the potential to increase efficiency in the overall learning process. Characteristics that distinguish learning platforms from regular exercise collections are user administration, course management, role definition and access and usage rights, availability of platform communication capabilities, learning tools such as a virtual classroom, placement of the learning curriculum content and media used in a network browser and, last but not least, a system for storing data and statistics on the activity and the results achieved by the learners. The main function of the electronic resources is to improve the attendance training and to increase the quality of the learning process, which in turn leads to the enrichment of the traditional forms and the autonomous learning of the students through the access to various information resources, materials, data and media. Each platform offers didactic tools in four main areas - course design, organization of teacher-student communication, access to additional and external resources, and an e-testing system. This infrastructure allows for the diversification of didactic approaches and information channels that take into account the different learning strategies and styles of learners in order to maximize the learning content. The purposeful use of learning strategies makes it possible to optimize learning, and in the event of difficulties, automated cognitive, metacognitive and resource-based strategies are applied and corrected or rejected accordingly. Knowledge and competence acquisition processes are not only dependent on the peculiarities and preferences of individual learners (or learning styles), but also on the learning object, the situations in which the learning process takes place, and external resources such as time, space, social characteristics and other side factors. Therefore, under different conditions, learners will choose different learning strategies, which in turn predetermines the style and success of the learning process. The structure of the learning resources offered by an electronic platform enables taking into account of all these additional factors and delegates to the learner the conscious choice of strategy, approach and media channel for obtaining information and its processing according to their leading learning style.

Keywords: learning platform, style, learning strategy, online courses, diversification

INTRODUCTION: E-CAMPUS AND THE LEARNING PLATFORM

As an organizational form, the e-campus means virtualization of all sectors in higher education institutions, making it a transient stage in the development of e-learning to e-university. While e-learning is limited almost entirely to curricula and learning management, the e-campus also includes administrative activities such as student, room, lecture, and exams management, as well as important information such as addresses, instruction for events, and timetables. The concentration of all forms of e-learning, online activities and services in an electronic campus facilitates and streamlines work with students and enables them to stay connected to the university when they are outside its territory. E-learning and the learning platform are a basic component of the e-campus and are gradually becoming an environment not only for learning activities but also for communication between teachers and students

1. E-LEARNING FUNCTIONS IN THE ACADEMIC SPHERE

Higher education programs include diverse forms of e-learning and opportunities for students to deepen their knowledge, to test acquired skills, and to use information technology to increase the efficiency of the learning process. The main function of the electronic resources is to improve the standard education and enhance the quality of the learning process, which results in the enrichment of the traditional forms and autonomous learning of the students through access to various information resources, materials, data and media, enhancing the up-to-date and the scope of the learning material by including online resources, interactive work with elements of learning content, and the visualization of complex, invisible, abstract or static processes, ensuring access to information of real objects that would otherwise not be available, e.g. as in medicine.

Inclusion of electronic resources and on-line courses in virtual campuses and use of the potential of new information technologies provides better communication and individual learning opportunities and achieves:

- better communication between teachers and learners, as well as between learners themselves;
- better mentoring of students using modern methods of communication outside the lecture courses;

- facilitating student learning by providing edited materials and tests and applying an individual approach;
- Increasing contact and collaboration opportunities with scientists and students from other countries.

Integration of electronic resources into traditional forms of academic learning allows for independent on time and location preparation for seminars, permanent access to teaching material, flexible learning with asynchronous collaboration capabilities and increased learner mobility. In addition, it stimulates the acquisition of strategic and key competencies in the field of information technologies, student autonomy and responsible work with new media and learning models, also teamwork.

2. DIDACTIC DIVERSIFICATION OF THE CURRICULUM

The term diversification is not inherent of didactics or pedagogy, but it seems to us that it best reflects the role of e-learning and its tools in contemporary academic teaching. The word comes from Latin (*diversus* - diverse, different, of a different direction; *facere* - to make). As a term it finds use in linguistics to describe the differentiation of an initial form of the word into various new forms or meanings. In this text we will use the word rather in the meaning used in economic sciences, expanding the choice to achieve greater chances of success or reducing risks (Gabler Wirtschaftslexikon). E-Learning and related learning platforms offer a similar extension of the choice of didactic methods and tools to increase the success and effectiveness of learning. As in the economy, here too we can talk of three types of diversification:

- **Horizontal** - expanding products that are similar to those already exported to the market. In the academic context, we can talk about the interaction of traditional attendance training with its lectures, seminars and exams, and the possibilities of an electronic platform to complement, expand and customize users to allow for autonomous and mobile learning.
- **Vertical** - expanding the range of products offered through elements from previous or subsequent production steps. In terms of the electronic platform, this means including textbooks, additional literature and links to electronic tools, statistics, and media that extend the students' cognitive horizons.
- **Lateral** - expanding the range of products that have not been offered to date by a company. The training is about a wide range of communication and interaction tools between the teacher and the students, and between the students themselves, which bring a whole new dimension to the learning process - blogs, diaries, chats, etc.

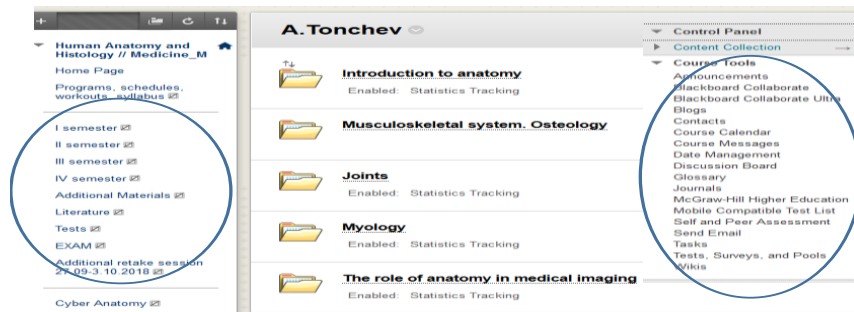


Figure 1: Horizontal, vertical and lateral diversification in education

By diversifying the forms and methods of providing learning resources, the learning platform focuses not on teaching and the teacher, but on the learner and the individual learning process according to preferred learning strategies and styles.

2.1 Organization of the learning platform

A Learning Platform or a Learning Management System (LMS) is a complex software system for creating and organizing learning content that allows communication between a provider (the teacher) and a recipient (the learner) and represents the intersection between teacher and learner goals. From a pedagogical point of view, therefore, the platform repeats the communication situation of traditional learning, but from a technological point of view it integrates specific tools for design, communication and administration of teaching units, coordinates online courses and parts of courses and detailed and permanent evaluation of trainees. Characteristics that distinguish learning platforms from regular collections of exercises or hypertexts on servers are user administration, course management, role definition and access and usage rights, the availability of platform communication capabilities such as chat, blogs and forums, learning tools such as a virtual classroom, placement of learning content and media

used in a network browser, and, last but not least, a system for storing data and statistics on activity and the results achieved by the trainees.

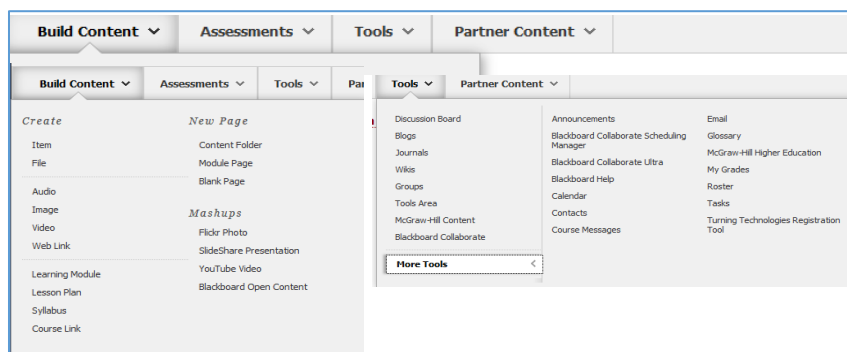


Fig. 2: Training Platform Toolkit

Learning platforms also differ from each other in terms of level of development of specific features. Each learning platform is characterized by a level of multimedia, where content is represented through different media channels such as text, film, sound, etc., adaptability, interactivity, distributivity and collaboration (Figure 2). There are many learning platforms available on the network that can be commercial, free and accessible to all users, Proprietary Projects that are subordinate to a specific topic or feature, and university platforms. The chosen learning platform on which to build a virtual teaching and learning environment can be an open source system, such as MOODLE, or a commercial like .LRN or Blackbord, however it is important for the platform to have all of the above features.

2.2 Learning Strategies and the Electronic Platform

The Learning Platform diversifies the learning process and provides a platform for the deployment of different learning strategies that are difficult to apply to traditional forms of learning. Learning strategies are basic building blocks of overall learning competence, especially when it comes to e-learning. Diversified multimedia content is motivational, versatile, authentic and user-friendly, but when developing such electronic resources, the peculiarities of information processing by learners should be provided to best support the learning process. Autonomous learning has two aspects: **individual learning** of the learning material and **independent** and responsible **management of learning** within the virtual environment. In addition to the psychological prerequisites (motivation, attitudes, etc.), a sufficient set of appropriate learning strategies is needed in the individual work with the learning material, as strategies play a key role in the success of the learning process. Learning strategies are a component of learner-oriented and autonomous learning stimulating education to enable learners to develop the ability to find their own ways of processing information, to cope with problem situations independently, and to choose from the available spectrum of learning strategies the ones they find suitable for them (Tönshoff, (2007).

Learning strategies are plans and modes of action as well as thinking processes that the learner applies to managing learning and achieving the learning objective. Lompscher defines learning strategies as more or less complex, to varying degrees generalized or generalizable, consciously or unconsciously used methods for realizing learning goals and fulfilling learning requirements. (Lompscher, 1996). Weinstein and Mandl understand under study strategies the overall internal and external behavior by which learners attempt to influence different aspects of their own learning, such as motivation, concentration, selection and processing of information, etc. (Friedrich, Mandl, 1992). These differ according to the learning curriculum of the subject, the general situation in which the learning process takes place and the individual learning style of each of the learners.

The on-purpose use of specific learning strategies makes it possible to optimize learning itself, and in the event of difficulties, to consciously resort to the automated strategies which are then either corrected or rejected accordingly. Conversely, conscious strategies can be automated by continuous application and monitoring. These processes and strategies of conscious impact on learning and perception are divided into three main categories (Baumert, 1993): cognitive, metacognitive and resource-based learning strategies.

Cognitive learning strategies affect aspects of the learning process that are directly related to the perception of information, such as specific techniques for memorizing new information. They are the organization's top priority, such as sketching, highlighting or tagging keywords, with the goal of reducing information flow, structuring and summarizing. Elaboration (reworking) aims to link new information to an already existing cognitive structure

(Mandl, Friedrich, 2006), so that the new material can be better understood. Effective learning, however, requires the use of strategies to verify the learning process. These are the so-called **control strategies** that operate so to speak over cognitive processes (Mandl et al. 2006) With their help, learners critically examine arguments and interdependencies and consider alternatives to what has already been learned; plan, observe and regulate their own thinking processes, and compare the received results. **Repetition** helps store facts and information in the long-term memory. This applies not only to word learning (foreign language learning), but also to terms and designations (in other sciences), rules, schemes, formulas, etc. The design and use of a series of different reproductive exercises based on teaching materials in the learning platform is also a form of repetition, eliminating the aspect of annoyance that is always associated with a repetition of the same material.

Metacognitive strategies are less relevant to the learning process itself, they refer to tracking and **being aware of one's own success or failure in the learning process** and to planning the individual steps such as determining the consistency of learning, separating the essential from the nonessential, monitoring and assessment of own results. An important component of metacognitive learner strategies is the explanation, for example, of a learning module to other learners in the form of presentation or group project design; search and presentation of specific information through the offline tools for communication of the learning platform, allowing for more effective mastering of the learning material. It is possible to accept as metacognitive processes the understanding of the assigned task, the formation of own strategies for solving different types of tasks (for example, the rationalization of own actions best suited for use in reading with comprehension), the conscious activation and use of the stored knowledge from external sources, compiling a search strategy in information resources, etc.

Resource-based learning strategies are directly related to the options offered by learning platforms and cover a wide range of factors that play a role in the learning process. They are divided into external and internal resources that are in constant interaction. Internal resources include the mobilization of own efforts, attention, will, and concentration in general, also the motivation to deal with different learning materials. **Motivation** as an activating attitude towards a positively assessed target state (Schiefele, Streblov, 2006) is considered as a central condition for the success of the learning process. In eLearning, internal motivation plays a significant role because learners manage the learning process themselves and motivation depends on whether the learner will perform a task at all. Internally motivated actions are done because they relate to positive experiences and are of interest or present a challenge to the learner, while the externally motivated have an instrumental function and are carried out in order to achieve positive results (e.g. good judgment, praise, etc.) or avoidance of negative consequences. In the learning process, external motivation usually prevails, but e-learning with its rich tools and interactivity enables the interest and the sense of individual direction and choice of learning objects, the confidence in one's own abilities and the role of the internal motivation for dealing with learning material. In the virtual learning environment, students participate directly or indirectly in the selection of learning content, choose their own learning strategy, have a free initiative and self-assessment space.

Management of learning time as a strategy is part of the e-course, as all tasks have a temporal limit and the learner can manage the distribution of working and resting time alone, and the disciplining effect of these limits should not be underestimated. Time independence is a key feature of e-learning and mobile learning, which delegates the learner the right to choose when and how he/she will study. Modern learning platforms offer enough time management options for the resource, and students quickly create strategies to meet these requirements.

The cooperative or group work strategy responds to the understanding that learning is a collective process and is done through social interaction. In this case, it is both an internal and an external resource as far as the attitude and competence for cooperative learning is required by the learner and, accordingly, the conditions and opportunities to do so are provided by the lecturers. For the e-learning platform, this means careful preparation of group work tasks, organizing communication between participants and dividing them into small groups to ensure efficiency in collaborative work. Part of resource-based learning strategies are **the use of tools, literature, dictionaries, reference books, and online resources**. A large number of students prefer to work with electronic resources, which is also the advantage of the online learning platform. Therefore, the eLearning course usually contains a "supplementary literature/application" section of each course that contains useful links, dictionaries, reference books, atlases, etc., which facilitates student access to the required information at any time and everywhere, and at the same time contributes to the development of strategies to use additional sources of information.

2.3 Learning styles and electronic resources

In contrast to the traditional understanding of learning, according to which knowledge is transferred from the teacher to the learner, constructive pedagogy considers learning to be an autonomous process of active construction of knowledge, and is determined by attitudes, experience, and already existing knowledge of learners.

It sees learning as an active, autonomous, constructive, situational and social process (Mandl, Krause, 2001), and not a reflection of the knowledge the teacher possesses. In other words, learning is an individual and socially-driven process of constructing knowledge in a given social context (Maturana, Varela, 1987). Individual differences between people in learning have been the subject of research before the introduction of computer-based and online-based learning. Common for the different theories is the understanding that under the same conditions people achieve different learning outcomes due to different pre-training, motivation and intellectual abilities of individual learners. It is also supposed that different people have different abilities or preferences about the senses and channels of perceiving new information, which leads to the emergence of different needs as to how to teach or present new knowledge. These personality traits and individual preferences are usually summed up with the notion of "learning style".

Typically, incoming information is perceived by learners differently depending on the mode of transmission - reading a text, listening to a lecture or interview, talking, writing an own text, etc. The electronic platform allows to take into consideration both the common (indicative) models for the participation of individual activities and information channels (media) in the effective learning of the teaching material as well as the individual preferences and abilities of the participants, i.e. their preferred learning styles. There are over 80 models of learning styles and the same number of definitions of the concept. The most common model with some variations is based on the sensory perception of incoming information. Wester distinguishes, for example, three main types: auditive (by listening and speaking), optical-visual (viewing and observing), and haptic (by touch and sensation) (Vester, 2001). Such a variant is also used by Kleinschroth (2005), which distinguishes the following three types of learners: **visual, verbal, and kinesthetic**. According to one of Richard Feldher's (1988) oldest models, there are five basic learning styles:

- **Learners** can easily understand and store the information **actively and reflectively** during discussions, practical application of the lesson or its explanation to others. **Reflective** learners prefer to think about things quietly. Group work is preferred by the **active**, while reflexive avoid it. Both subtypes do not like listening to lectures and taking notes, and when taking part in a course, such as an electronic one that does not offer opportunities for discussion and problem solving, one should think of similar online tasks where group participants can exchange information open to them or explain separate questions to each other.
- **Sentient and intuitive learners** prefer facts and details, methodical approach to material and problem solving as they are rather practical and cautious and need a connection with reality and (practical) examples. The sentient are typically patient in the details and are interested in practical work, while the intuitive ones are open to new concepts and are better suited to abstractions and mathematical formulas.
- **Visual and auditory/verbal learners.** Visual learners prefer to perceive and process information through films, images, symbols, tables, data, diagrams, demonstrations and simulations. Auditory/verbal learners prefer words in oral and written form, oral expositions. The best result is obtained when verbalpresentation is combined with a visual presentation, which means that the maximum amount of visual materials - diagrams, schemes, pictures, images, animations, videos, etc. - should be included in the e-course to illustrate the verbally presented topic.
- **Sequential and global learners.** Gradually, learners tend towards a linear and logically coherent consistency and understanding of the curriculum, solving the problems step by step and successively. Global learners teach leaps without a visible connection, accidentally making connections between things, but solving problems faster. E-Courses have a sequential nature, as the course material is given in logical order, but it also provides an opportunity for global learners to link the individual elements of the curriculum using the hypertext structure to construct their own paths to knowledge.
- **Inductive and deductive learners.** Inductive learners assimilate the learning content by summing up the study of the pathway from private to general, and prefer to find regularities through observation, comparison, and generalization. They attach great importance to experience in the field, while deductive learners love the visuals and examples, apply the theoretical formulations in practical solution to a particular problem and adhere to the rules and definitions.

There are a number of other learning styles, but the table below shows as an example the relationship between the learning styles described above and certain forms, tasks and exercises from a virtual course or an electronic learning environment, as the division is conditional and a large part of the tasks and exercises refer to more than one style of learning.

Table 1: Learning styles and their relationship with an e-learning course

Learning styles	Preferred learning activities and elements in an electronic learning environment / e-course
Active and reflexive learners Kinesthetic / haptic	role-playing games, discussions, internet research and projects, online tasks for group work and collaboration, discussions, problem solving, constructing knowledge in context
Sensual and intuitive learners Optical-visual style	pictures, charts and graphs, practical tasks, simulations, case studies, colors to accentuate the important issues
Visual and auditory / verbal Verbal / Audience	instructions, listening exercises, movies, images, symbols, tables, data, charts, simulations, oral presentations of results, combination of verbal and visual presentation
Sequential and global learners	logically structured teaching materials, sequence of theory and tasks, hypertext structure, choice of sequence, access to more sources, argumentation exercises, conducted internet search
Inductive and deductive learners	writing summaries, finding dependencies and common indicators, exercises for generalizing or specifying information,

3. CONCLUSION

The interactions considered relate to the teachers' daily and professional discourse, and at the same time characterize patterns, learning styles, or typical learning and educational processes. The processes of acquiring knowledge and competencies do not depend only on the peculiarities and preferences of the individual learners, but also on the learning object, the situations in which the learning process takes place, as well as external resources such as time, space, social characteristics and others side factors. Therefore, under different conditions, learners will choose different learning strategies, which in turn predetermines the style and success of the learning process. The structure of the learning resources offered by an electronic platform enables taking into account all these additional factors and delegates to the learner the conscious choice of strategy, approach and media channel for obtaining information and its processing according to its leading learning style.

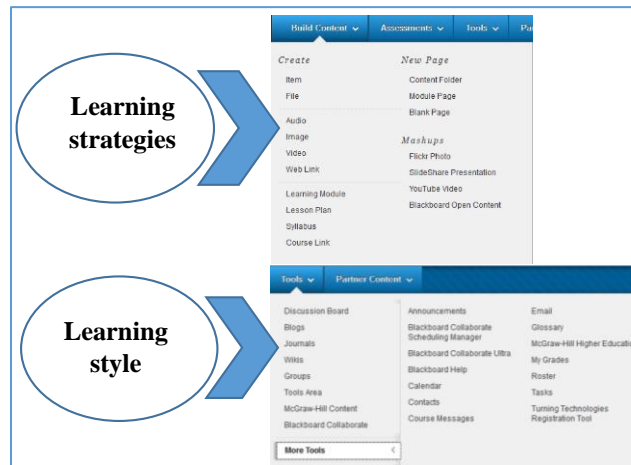


Fig. 3: Choices depending on strategies and learning styles

In conclusion, it is worth mentioning that within the learning platform there is bilateral diversification - the teacher has the tools to use different media channels to provide the necessary learning resources (texts, graphics, images, films, audio and video recordings of lectures etc.), sort them logically or in accordance with defined cognitive learning processes, provide additional materials of any kind. The trainee is not obliged to follow the teacher's logic – under different circumstances students choose their preferred style of learning and organize individually their way to knowledge in accordance with the chosen strategy and method of working with educational materials. Therefore, in the future, beyond the final positive or negative assessments, eLearning will gradually be matched to the traditional pedagogical paradigm for the benefit of learners and the learning process itself.

REFERENCES

- [1] Baumert, J. (1993), Lernstrategien, motivationale Orientierung und Selbstwirksamkeitsüberzeugungen im Kontext schulischen Lernens. Unterrichtswissenschaft, 21, p. 327-354
- [2] Felder R.; Silverman L. (1988), Learning and teaching styles in engineering education. Journal of Engineering Education, 7 (78), p. 674-681
- [3] Friedrich, H.F., Mandl, H. (1992) (Hrsg., Lern- und Denkstrategien. Göttingen: Hogrefe Verlag
- [4] Gabler Wirtschaftslexikon, <https://wirtschaftslexikon.gabler.de/definition/diversifikation-34156>
- [5] Kleinschroth, R. (2005), Sprachen lernen. Der Schlüssel zur richtigen Technik, 4. vollständig überarb. u. erw. Aufl., Reinbeck bei Hamburg: Rowohlt
- [6] Lompscher, J. (1996), Lernstrategien- eine Komponente der Lerntätigkeit. LLF- Berichte 13, Frankfurt
- [7] Mandl, H., Friedrich, H.F. (2006), Lernstil. In: Mandl, H., Friedrich, H.F. (Hrsg.) Handbuch Lernstrategien. Göttingen: Hogrefe Verlag
- [8] Mandl, H., Krause, U.-M. (2001), Lernkompetenz für die Wissensgesellschaft (Forschungsbericht Nr. 145), München: Ludwig-Maximilians-Universität, http://epub.ub.uni-muenchen.de/253/1/FB_145.pdf
- [9] Maturana H. R., Varela F. J. (1987), Der Baum der Erkenntnis. Die biologischen Wurzeln des Erkennens, Goldmann, München
- [10] Schiefele, U., Streblow, L. (2006), Motivation aktivieren. In: Mandl, H., Friedrich, H.F. (Hrsg.) Handbuch Lernstrategien, Göttingen: Hogrefe Verlag
- [11] Tönshoff, W. (2007), Lernerstrategien. In: Handbuch Fremdsprachenunterricht. Herausgeber Bauch, K.-R., Christ, H., Krumm, H.-J. A. Franke Verlag Tübingen, 5. Auflage. p. 331-335
- [12] Vester, F. (2001), Denken, Lernen, Vergessen. Sonderausgabe (28. Aufl.), München, DTV

