Abstract: The paper presents comprehensive study of applicability of Moodle virtual learning environment to the development of practical skills. The quantitative research involved 90 students and 26 lecturers. Data analysis indicated that currently the most beneficial method to develop practical skills is blended method. This result, however, turned out to be more positive for students than for lecturers, the latter being less willing to employ technology alongside traditional classroom. The study also puts forward recommendations for further research.

Keywords: Virtual Learning Environment, Blended Learning, Moodle, Practical skills, Educational Data Mining

1 Introduction
Modern society is extremely dynamic and receptive to innovation. A contemporary person has to develop ability to memorize new knowledge and information faster than it becomes outdated and old. Former definition of a learning process as transmission of experience by the older generation to the younger is being replaced by a relatively new concept of lifelong learning, where knowledge, qualification, information no longer belong to school and university years, and where individuals must demonstrate ability to remain up-to-date.

Concept of lifelong learning also means that in this day and age an active member of society is required never-ending time investments into self-development. Alas, not many students and working people find it possible to spare any time from their usually busy routine to develop new skills or refresh old knowledge. Consequently, modern-day educators are seeking for innovative ways to deliver their services to the wider public.

Memorandum on life-long learning, presented by the European Commission, laid out a request to respond to the demands of the new knowledge-based society and to ensure that everyone can easily access good-quality information and advice about learning. A special emphasis was granted to the use of computer technologies [4]. This way IT serves as the facilitator of distance education, and distance studies are being promoted as the main means to implement life-long learning.

Distance Learning (DL) is an instructional delivery system that connects learners with educational resources. Distance Learning provides educational access to learners not enrolled in educational institutions and can augment the learning opportunities of current students. The implementation of DL is a process that uses available resources and will evolve to incorporate emerging technologies [10]. E-learning allow students to actively participate in their own learning, gives them the opportunity to interact with their peers, provide peer feedback, and reflect on the status of their personal learning goals and outcomes [5], [7], [16]. Information technologies (IT) and e-learning process are indispensable core elements of Distance Learning.

Vilnius College of Technologies and Design offers blended distance studies with both synchronic and asynchronic learning elements. The College opted for innovative teaching methods due to the growing demands of contemporary students, a large number of whom cannot come to the College on
daily basis, as they live and work abroad, study at several institutions at the same time, have a job and do not want to drop out of the working community, etc.. Thus, the object of this study is to find out opinion of students and of lecturers on the use of Moodle environment in the study process at VTDK.

2 Use of Virtual Learning Elements

One of the most important factors influencing lifelong learning is creating and adaptation of learning possibilities for each individual member in a society ensuring curriculum quality and meeting the learners needs [18]. In the context or learning possibility development analysis, distance learning and teaching gains major importance. Teaching/learning curriculum planning, realization and effective teaching and learning organization issues should be decided during distance teaching/learning curriculum designing. E-learning platforms are becoming increasingly sophisticated, showing potential as an effective way for improving the learning process [6].

Definitions and key words:

- **Teaching/learning curriculum** – the consistency and interaction of the main teaching and learning process parameters (objectives, teaching/learning organization methods, teaching means, and assessment strategy) in a constant development process. This conception describes the overall context of teaching/learning, where each element is oriented towards a goal, determined by the interaction with other elements, and has its own particular place and meaning [18].

- **Designing teaching/learning curriculum** – constant improvement of training program parameters oriented towards a perspective: improvement of existing processes with respect to learning needs’ changes, new training programs, etc. [18].

- **Distance teaching/learning curriculum** – teaching/learning curriculum adapted to the organization of teaching/learning in a distance mode [18].

- **Blended learning** is:
  - a combination of various networked technologies in a single learning package;
  - a combination of various lecturing technologies (video cassettes, compact discs, internet material, etc.) together with direct lecturing by an instructor [8].

- **A virtual learning environment (VLE)** is a software system designed to support teaching and learning. A VLE typically provides tools such as those for assessment, communication, uploading of content, return of students’ work, administration of student groups, questionnaires, tracking tools, wikis, blogs, chats, forums, etc. over internet [10].

- **Moodle (Modular Object-Oriented Dynamic Learning Environment)** is a free e-learning software platform, originally developed to enable educators to create online courses to encourage interaction and collaborative construction of learning content [1].

Moodle is called learning management system (LMS) or a Virtual Learning Environment (VLE) which is most popular all over the world. Moodle provides tools that can be turned on and off according to the planning established, allowing the definition of learning modules with activities and tasks in collaborative format [15]. Moodle is a great way for teachers to organize, manage and deliver course materials. From the didactic point of view, the usage of multimedia tools to create attractive activities makes the learning process friendlier for students [10].

Some typical features of the Moodle are:

- Assignment submission;
- Discussion forum;
- Files download / upload (supports many formats);
- Grading / Marks;
- Moodle instant messages / mails;
- Online calendar;
- Online news and announcement (College and course level);
- Online quiz;
- Wiki [2].

Still, single solutions cannot ensure qualitative learning and teaching service provision, as qualitative learning and teaching covers a multifunctional system with different teaching and learning curriculum designing as well as teaching and learning organization aspects included. Teaching/learning curriculum planning, realization and effective teaching and learning organization issues should be decided during distance teaching/learning curriculum designing [18]. The authors of
distance teaching/learning curriculum often do not have necessary competencies to select technological solutions for curriculum realization. They trust (or have to trust) the opinion of ICT specialists and their recommendations. During distance teaching/learning curriculum designing, three components of distance teaching/learning curriculum can be identified: teaching/learning subject (or study subject), teaching/learning situation (internal and external conditions affecting the success of learning and constantly changing), and teaching/learning organization, that should be characterized by the flexibility criterion, as it directly depends upon the changing teaching/learning situation [18]. However, research into technological e-learning elements, their applicability possibilities, impact on the study results is scarce and not specific. Scientific interest is mostly confined to the results of theoretical and visual material presentation as well as examination in distance learning environment.

As a rule, development of practical skills in the distance learning environment requires complicated technologies and technical resources, such as video material, virtual laboratories, virtual lab management, simulators, training games, etc. Majority of the technology require substantial investment, considerable preparation of lecturers and of students. Hence, it has become common to shift to blended learning, where theoretical material is presented using asynchronous tools (texts, slides, video recordings, etc.) while practical skills are developed in a traditional „brick and mortar“ way in established laboratories.

2.1 The Method of the Survey
The study set out to examine opinion of academic community at VTDK about the usefulness of elements of Moodle environment while seeking to improve the quality of studies. To achieve this goal a sample of 116 questionnaires were filled in by 90 full time students and 26 lecturers at Vilnius College of Technologies and Design (VTDK). Majority of the students were in their second year of the studies, and only 14 % of them were in the first or the third study year. The data collection of the students and lecturers was completed in the spring semester of 2015.

Although VTDK has been known for the traditional classroom training where lecture attendance is compulsory, the college seeks to meet the needs of an increasingly technology-oriented society, and has started to opt for blended learning, where features of both, traditional and e-learning are merged to improve study quality. Apart from face-to-face lectures, students are provided with a possibility to deepen their knowledge and skills, to participate in forums, to seek consultations in virtual environment. Lecturers can also place their material; assign tasks, forward tests in an online learning environment.

Libraries, Reading rooms and IT classrooms give both students and academic staff an unlimited access to the computers of the college. Apart from that, majority of the surveyed have their own PCs. The questionnaires consisted of 15 questions, part of which were open format, others of closed. It ensured better grounded and more credible information. Majority of the questions directed at the students and at the lecturers were the same, and only a few slightly differed. For example, a question for the students Have you ever taken an exam or a test in the Moodle system? Coincided with a question directed to the academic staff: Have you ever organised an exam or a test in the Moodle system?

The survey was conducted online. All in all, 120 questionnaires were emailed, and only four of them were not returned.

2.2 The Results
Although the results of the survey obtained from the group of students differed from those of lecturers, responses within each group were similar. Both students and lecturers were asked what type of lectures they would choose given a chance – in the classroom, online or a combination of these both. It appeared that slightly more than half of the respondents in both groups would choose combination of the traditional and virtual learning (54% lecturers, 58% students). Purely virtual lectures did not enjoy popularity - as little as 11% of students expressed desire to study online, and there was not a single lecturer who would like to resort to teaching only via internet. However, face-to-face learning and teaching have lost its appeal with neither lecturers nor students. Almost half of the lecturing respondents are still keen on teaching in a traditional way (46%), and the same answer was indicated by almost one third of the students (31%).
Another question concerned the usefulness of the Moodle system. The answers provided by the two groups of respondents differed significantly. While the majority of the students stated that they found Moodle elements useful (81%), their teachers were less positive. Although not a single teacher defined Moodle as not useful, almost 40% of them indicated having no opinion, and only a bit more than a half of them found elements of Moodle beneficial to the study process.

A question regarding instruction on how to use Moodle, both groups of respondents answered positively – they all have had a course on Moodle use. However, when asked if they found Moodle user-friendly, lecturers and students presented very different answers. A vast majority of students (73.3%) experience no difficulties, whereas lecturers were of an opposite opinion. 76.9% of them stated that they found Moodle complicated to use.

Possibilities that emerge from using Virtual Learning Environment in the study process help to achieve convenience, flexibility, conformity with student’s needs. As a result, the elements of Virtual Learning Environment are highly appreciated by students.

Regarding the usefulness of different elements offered by the Moodle system, the file sharing function seems to be the most frequently used element among both students (66%) and lecturers (75%). The second common choice for both groups was assignment submission, with slightly less than half of the lecturers and almost 40% of the students using this element. Other Moodle elements proved to be less popular among the participants of the survey. As the diagram in Figure 2 presents, calendar is used by only 6% of students and 17% of lecturers, 2% students and 3% lecturers use Moodle for sending personal messages, and neither students nor lecturers participate in the forums offered by Moodle system. Such results imply that elements which are more interactive are less popular than those that are not. Apparently, Moodle is generally used to access information, but to a much smaller extent as an interactive platform, as for interaction with peers and lectures they commonly use other means of communication (e-mail, facebook, etc.).

A vast majority of students (89%) stated to have written a test or taken an exam in the Moodle environment and nearly all of them (93%) described the experience as positive. A large number (84.6%) of lecturers, however, admitted having never organized a test or an exam in Moodle learning environment. Such response of the academic staff implies that lecturers still avoid developing assessment tasks online. Some of the respondents have indicated reasons for such reluctance – time consumption, complicated procedures, lack of computer literacy and skills, difficult interpretation of students’ answers to open format questions.

The research revealed positive opinion of the students about the advantages arising from their use of Moodle system.
Fig. 2 The Use of Moodle Elements in the Study process

As indicated in the diagram, the opinion of respondents on the usefulness of the Moodle is divided more or less evenly. Both samples (13% students, 17.0% lecturers) agree that Moodle is an innovative learning environment which allows to save time (17.9% - students, 6.4% - lecturers), allows flexibility in managing learning and teaching process (13% - students, 10.6% - lecturers), Moodle as a convenient means to receive and to store more theoretical and practical material is seen by 6% students and by one fifth of lecturers. However, as an instrument to improve study planning Moodle is more appreciated by students than by academic staff. Almost 40% students consider flexibility to be the greatest Moodle advantage: nearly twenty percent of them use the environment to read the material of the lectures they have failed to attend, a similar number use Moodle to get more material than in traditional classroom environment, and only less than ten percent consider it a convenience which lets students to skip lectures. Only 12.8% lecturers praised Moodle for allowing more flexibility in the study process. One tenth of the students noted that Moodle allowed them to study while working.

When asked what drawbacks of distance learning they could identify, both students and teachers named a lack of face-to-face communication, internet access necessity, complexity of the system. Lack of “live” communication was mentioned by a fifth of students and almost half of teaching staff. Forty percent of students complained about the constant need for internet access, while lecturing respondents did not see it as a great obstacle. Almost one third of the lecturers described Moodle as a very complicated and difficult to manage learning environment, whereas among students complexity was not the main disadvantage (22.7 %). One fifth of the students also criticized the need to memorize passwords.

Half of the students indicated that the theoretical material their lecturers place for them in the Moodle system was very good, slightly more than forty evaluated it as good, and only less than ten percent claimed to be unsatisfied with it. Very similar results were obtained when students had to comment the accessibility of information.
Lecturers, when asked to assess the material they have placed in the Moodle environment, were significantly more critical. None of the respondents described the methodical material as fully completed; nearly half of them admitted the material to be incomplete. (the material is presented in a chaotic way - 45%, a lack of audio, video material - 25%, shortage of self-control tasks and tests - 30%).

Nearly all of the students (95.7%) were positive when asked about the usefulness of the methodical material prepared by their lecturers. Such students' approach confirms the validity of the elements of virtual learning environment that are used in the blended learning process. Almost forty percent of respondents support an idea that the use of virtual learning environment should become a compulsory part of the study process, about the same number of students and lecturers consider Moodle to be of great benefit for the studies, and nearly one fifth of them have no opinion on the matter.

3 Conclusions and recommendations for future works

Review of scientific research indicates that applicability of Moodle is among the most actively surveyed academic fields, and that Moodle is one of the most popular virtual learning environment exploited to provide distance learning globally. Applicability of Moodle in distance learning is researched in nonspecific manner with emphasis on satisfaction of participants in the study process where different Moodle activities are employed. Yet, research into what particular activities are most appropriate for developing specific skills, is lacking. While analysing scientific literature, most attention was devoted to research into distance learning in the development of practical skills. (disciplines that are not related to IT). As the means to develop these skills require substantial investment of time, money, intellectual resources, a typical answer is blended learning, face-to-face classroom methods are combined with computer-mediated activities, and which still presents academia with a large field for the research.

The overarching aim of this research was to examine opinion of students and lecturers about the applicability of Moodle elements. The results clearly indicate that the overall experience with Moodle is good, and that e-learning is beneficial from the point of educology, but complicated in technological respect. As the scope of the present study was not broad enough to allow generalization of the results, it calls for further research with more participants involved. An experimental research would benefit from collecting students and lecturers' data from the Moodle system. It would allow to develop database with information which could prove highly beneficial for researching distance learning in the development of practical skills, such as participation of students in different e-courses, the time they spend in the system, the results of their progress assessments and examinations, etc. Data Mining technologies, that are commonly applied not only to resolve business issues, but also to forecast study results, could be of great value to achieve this end. Data mining can be a great scientific instrument in identifying factors leading to successful study process and results, improving adaptation and personalization of the learning environment, etc.

References:


