

Learning Management Systems in Academic and Corporate Distance Education

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Abstract—Present-day development of information technologies is making deeper and deeper incursions into all spheres of human activity, both social and economic. It is only natural that they greatly influence the educational industry, changing the approaches, methods and forms of education. Currently e-learning and distance technologies are being actively introduced into both academic and corporate education, as complementary to traditional forms. The efforts of teachers are aimed at finding effective models of blended learning. All this determines the relevance of the present study. The abstracted article is aimed at developing frameworks of a distance learning model based on the use of modern learning management systems. To obtain thorough and reliable results the authors make use of two research approaches: acmeological and competence-based. They review the features, the scope and use of the existing LMS platforms and work out tools for the development of e-learning system. In addition, they assess the compliance of e-learning tools with the preferences of X, Y and Z generation users. The outcome of the research is the development of a universal competency that can be applied to the study of modern methods and approaches with reference to both academic teaching and learning, and to corporate training. It is quite apparent that pros and cons of the learning management system and its possibilities should be carefully studied and thoughtfully used. The effective e-learning requires constant monitoring of equipment, proper work of host servers and considering user-friendliness of the platforms. This is related to the fact that public educational organizations, including schools, col-

leges and universities, especially in low developed countries, prefer traditional teaching methods and are slowly moving to innovative models. The research findings can be viewed as a step forward in creating user-friendly and flexible e-learning platforms, suitable for separate users, institutions and businesses. They can be applied for further assessment of existing learning models, especially for the younger generation, and for research and development of new strategies and methods of using learning management systems and platforms.

Keywords—Educational methods, LMS-models and systems, on-line educational platforms

1 Introduction

Advances in information and cognitive technologies are changing the pace and the face of social and business processes today. Certainly, the flourishing industry of technology is influencing both the general and corporate subsectors of education sector, resulting in a change of teaching approaches, modes and methods. The use of diverse gadgets in e-learning helps speed up the learning process and create a convenient flexible schedule for students and employees. Education in an online environment is famous for its interactivity and opportunities to combine several teachings and learning strategies. In addition, e-learning courses are normally designed for individuals who are both advanced and new to the subject matter [2; 11; 25; 28; 53].

Recently, the Learning Management System (LMS) has been at the forefront in education [71]. It is also known as an e-learning platform that enables the training process both online and offline. The top famous e-learning platforms include Moodle, Blackboard, Canvas, eCollege, Cornerstone, SumTotal, WebCT (now owned by Blackboard), and etc. Overall, the LMSs are classified into international (TalentLMS, LearnUpon, eFront) and local e-learning platforms (iSpring Learn, Mirapolis LMS, ShareKnowledge, Teachbase, and etc.) with the latter category taking into account the national demands for and trends in education [10; 40; 6; 65; 37].

Most scholars interested in the modernization of learning systems pointed out that the use of e-learning platforms enabled institutions to teach hundreds and even thousands of students, employees and clients around the world at once. Surely, this type of technology can be used by diverse educational and business organizations. The software platform offers functionality to manage and track the activity of all parties involved in the learning process, i.e., learners and teachers [17; 32; 12; 43].

Educational institutions use e-learning platforms for multiple reasons. The LMS technology helps enroll students who do not live near or within the campus location. Usage of teaching technologies is not limited to the audience size. In addition, students and remote learners have the opportunity to study at a time and a pace that is most convenient for them. Also, they have additional opportunities to use tactical strategies for integrating various teaching methods into managed modules or smaller lesson units [51; 41; 48].

Business organizations, on the other hand, use LMSs to make sure that new and old employees have the necessary skills and competencies. These organizations can also

use this type of technology to convey company rules and other valuable information (e.g., safety rules) to recruits [70]. Organizations have also perceived that their training platforms can be used as a tool for continuous learning improvement beyond compatibility and adaptability [77; 89; 86]. New technologies such as the e-learning platforms require potential users to create new curricula. Eventually, the mainstream trends in education will demand the improvement of a regulatory framework for this industry.

Hence, the research questions are:

1. What distinguishes LMS platforms applied in educational institutions and private corporations?
2. What are the strengths and weaknesses of LMS platforms?
3. What opportunities do LMS platforms provide?
4. What are the modern concepts of distance learning?
5. What distance learning platforms are used to teach younger generations (X, Y, and Z)?
6. What are the reasons younger generations prefer to use remote learning platforms than traditional teaching methods?
7. What are the conceptual fundamentals of distance learning that may be utilized in Human Resource strategies?

2 Literature Review

In today's dynamically changing world, the latest technology may become obsolete in a few years or decades [56; 79]. The knowledge students acquire in school and university may no longer be of value by the time of employment [13]. This makes the LMS platforms market one of the fastest growing markets in the technology industry [18]. The educational LMS space integrates the breakthrough technologies like artificial intelligence, virtual reality, and mobile communications to attract more platform users [27]. In recent years, there has been an active promotion of LMSs in higher education [26; 21]. The technology market offered new tools for the higher educational institutions to manage their e-learning process. Most teachers and administrators' value LMS benefits such as the ability to better make course content, track, and report student progress [47]. The relevant concerns of LMS designers and providers relate to meeting the needs and preferences of young generations (i.e., X, Y, and Z). The representatives of these generations view mobile training as a necessity and the Gen Z usually encourages organizations to improve their infrastructure by digitalization [58]. In this light, the system of higher education needs to be redefined in terms of mobile communications. The key additions involve:

1. Content library with searchable video materials
2. Collaborative learning solutions
3. Content quality control mechanisms
4. Solutions for self-study and critical thinking [54; 55].

The LMS applications have existed almost for two decades [80]. Recently, they have gained popularity among private colleges and universities due to the rise of the global Internet [9; 15]. The growing number of these institutions not only gave rise for the education quality concerns but also opened new opportunities [16].

Initially, e-learning platforms were used to document and conduct online, asynchronous, and computer-based training via the Internet. Nowadays, a learner can also use these platforms for streaming or synchronous study. The LMS analytical reports help individuals and training organizations perform better [83; 34; 36].

Although the LMS software solutions may be used by any institution, either a private training organization or a business entity [81], particular platforms are designed to meet the needs of specific organizations [41]. This contradiction arises from the fact that teaching strategies used by business companies differ from those typically implemented in higher education. In addition, LMS platforms offer a set of tools to track e-learning performance and get certification [15; 17; 76].

Sources analyzed within the framework of this study stipulate that the diversity of approaches towards the e-learning course design is linked to the contexts of e-learning such as technology infrastructure, limitations of the discipline and curricula, and stakeholders [68]. As many users have pointed out, learning through LMS (e.g., Moodle platform) is fraught with difficulties such as user-unfriendliness, server requirements, and substantial skills requirement. Since user-unfriendliness is the most common complaint relating to Moodle, many measures have been recently taken to simplify its workplace [78; 84].

Hence, when implementing an e-learning solution, it is necessary to monitor hardware health and software performance, to keep the hosting servers in function, and to improve the system's functionality for the convenience of users (students). In addition, the state educational institutions, especially in less developed countries with medium and low incomes, prefer traditional teaching methods and move towards an innovative classroom at a slow pace [72; 73; 6].

3 Materials and Methods

3.1 Research design

The LMS design is intended to create a user-convenient learning experience. In particular, e-learning software solutions allow users (students, teachers, administrators) to generate e-learning content (lessons), organize it into courses, deliver the content, enroll students to said courses, and, finally, to monitor and assess their performance.

Methods used in the study to explore the quantitative and qualitative changes in the LMS market in China and around the world include general research methods and methods of statistical, economic and financial analysis. The design and use of foreign and Russian LMS platforms were analyzed by means of a comparative approach. Through systematization and theoretical generalization, a set of e-learning manage-

ment tools was developed. In addition, the study explored the extent to which e-learning tools meet the preferences of potential multi-generation users.

Findings obtained using the acmeological and competency-based approaches as well as by modeling allowed building an underlying model of e-learning management based on the principles of technocracy [22]. This LMS model illustrated the process of LMS integration in higher education.

At its core, a learning management system is a software application that helps create, manage and deliver e-learning courses. An LMS is an "engine" that powers e-learning. In the most common form, it consists of: (1) a server component that performs the core functionality (creating, managing and delivering courses, authenticating users, serving data and notifications, etc.); and (2) a user interface that runs inside a browser as a web (like Gmail or Facebook) that is used by administrators, instructors and students.

A non-exhaustive list of LMS users includes anybody, who is engaged in e-learning; businesses of all sizes; for-profit and non-profit organizations; government agencies and local governments; and educational institutions, from traditional to online and e-learning-based (e.g., online schools from Khan Academy to Lynda.com).

An LMS can be used as a virtual classroom tool to teach both university students and employees across the globe. Its pros include (1) the availability of learning materials (books, videos, e-courses, tests, and etc.); (2) the ability to study at distance; (3) the ability to create a streamlined onboarding process; (4) detailed statistics for keeping track of the progress of learners or departments. For each course, the said statistics involve the total number of currently open courses, test scores, the relative learning path, and so on [25].

The LMS types are divided in two categories: housed on a computer (on premise or self-hosted) and cloud-based (hosted online). Here are some of the most common use cases for an LMS platform. With LMS, companies can cut down on employee training costs and eliminate business disruptions associated with traditional learning by letting their employees study materials online and at their own pace. It is also a good place to educate new hires on the company's employee conduct code, privacy guidelines, and policies. LMS is a good fit for the needs of online course sellers, educational organizations seeking to supplement their classroom-based courses, businesses, and even government or non-government agencies [57].

3.2 Data analysis

The implementation of e-learning through LMS is governed by the latest information technology trends [44]. Thus, the e-learning content must meet the requirements imposed by a digital society. According to the IDC's "third platform" concept, the LMS platforms must integrate with mobile devices and cloud systems, permit big data analytics, and be a social technology. In 2019, a shift towards cloud computing continued at the accelerating pace. Hence, one may suggest that the present-day society is aware of a growth-driving role of the IT industry [57; 63].

Over the past three years, GfK reports have been acknowledging a mobile internet-user boom. The statistic showed the audience of Internet users in Russia has hit a

high. By the end of 2016, the total number of Internet users did not change significantly, while the number of users accessing the Internet from mobile devices amounted to 8.5 million people by the end of 2018 [70]. In addition, the ICT-based distance learning opportunities are constantly expanding. Thus, according to the 2017-2030 Strategy for the Development of an Information Society in the Russian Federation, e-learning solutions are expected to help expand the availability of high-quality educational services. Many institutions of higher education in Russia apply LMS to streamline the distance learning process [75].

Figures 1-3 show the number of users of the world’s most popular LMS platforms from the 2018 Capterra report. The market analysis embraced two sub-segments, academic and corporate LMS.

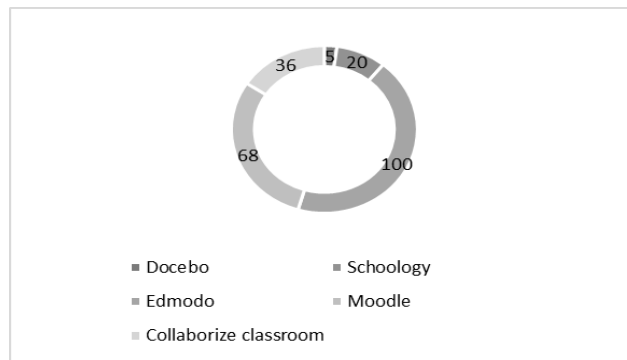


Fig. 1. The top 5 most popular LMS-platforms by total customers (in thousand), 2018

Source: [47]

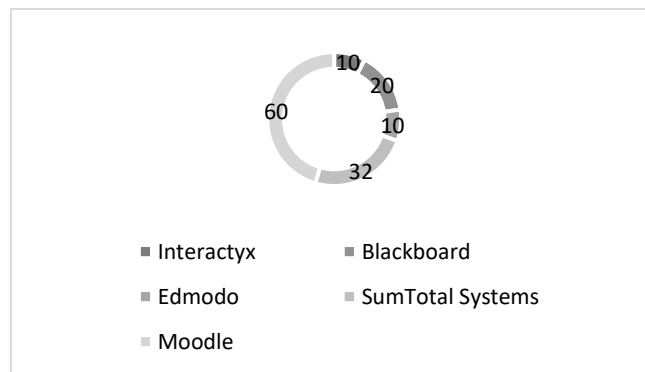


Fig. 2. The top 5 most popular LMS-platforms by total users (in thousand), 2018

Source: [47]

Recent years saw a number of technology advances but the considerable change in the market was linked to customer expectations. Today, it is not enough to offer a piece of software; people want solutions.

At the rate the extent of learning management system research and development initiatives is driving new technological innovations [69; 87], it is probable that many companies will invest more of their L&D dollars into a learning management system, which not only delivers and tracks training but also provides effective results. The same goes for schools worldwide, where administrators are increasingly collaborating with their IT departments in choosing the best LMS for their institutions [8; 62].

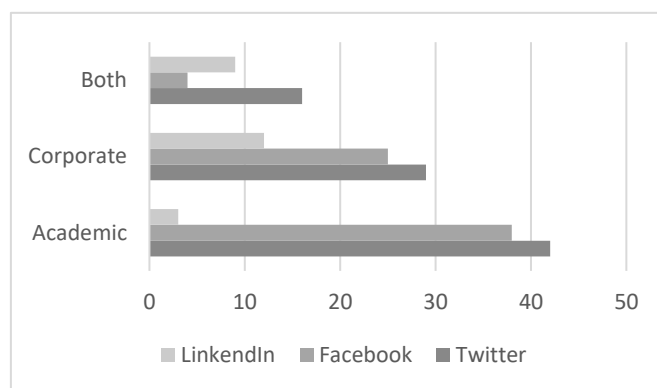


Fig. 3. LMS market by target segments (corporate, academic) (in thousand), 2018

Source: [47]

For the past 16 years, small businesses have increased their use of e-learning by 900%, making online learning as the new normal (SmallBizTrends). Among businesses that use LMS systems, 74% of employees take advantage of the BYOD policy (bring-your-own-device policy that regulates IT department's level of support for employee-owned devices) as this enables learning at the comfort of their own device (Tech Pro Research). As adults spend up to five hours daily watching videos, 98% of organizations worldwide are using video-based training programs in their digital learning approaches (Ambient Insight). Among college students who had the option to choose between online and traditional face-to-face learning, almost 60% selected online learning (Learning House and Aslanian Market Research). By 2020, 98% of small business are planning to use LMS to fulfill their learning requirements (SmallBizTrends). To fill-up their skills gaps and reach their full capacity, numerous companies have invested more money into L&D in 2018 (Forbes). The overwhelming majority of students use mobile devices not only to search for their online program of study (87%) but also to complete online coursework (67%) (Learning House and Aslanian Market Research). Taking advantage of LMS platforms offerings, Google has enrolled 80,000 of its employees in Udacity's HTML5 course [27].

At the end of 2017, the Stanford University and the Stanford Graduate School of Business finished their transitioning to Canvas, a cloud-based learning management system developed by Instructure, Inc. (LMS) [14]. Stanford had used CourseWork (Sakai) LMS since 2005. Over the last ten years, there have been many changes in the LMS technology. Modern learning management systems offered exciting features and

functionalities. Therefore, Stanford selected Canvas as its new LMS after a review of a current LMS landscape and the analysis of feedback from the Canvas pilot [12]. The Canvas team claims that currently 48% of campuses worldwide consider to migrate to another LMS. The Canvas project was launched in 2011. It is a flexible, secure, and adaptable LMS that supports current and evolving teaching and learning needs. Canvas can be implemented to organize a course using content modules as well as to stimulate active learning and critical thinking. Among other benefits, the Canvas LMS features an easy creation of learning content, permits file attachments, and allows the instructor and students to communicate using text and video (via webcam). The Canvas tool enables the creation of group projects. Instructure also offers a mobile app for smartphones [5].

Today, millions of people around the world and over 3,000 educational institutions use Canvas. Among them, the University of Pennsylvania, the Northwestern University, and the Columbia Business School. As of 2018, Stanford made more than 1,780 courses with Canvas [12].

Another example of LMS is the Cambridge Learning Management System (CLMS), a robust platform that holds course content, materials and administration in one user-friendly online system. This platform allows teachers to easily manage classes and track their students' progress by highlighting areas of strength and weakness for ongoing performance improvement [19]. What is more, CLMS creates an environment where students can interact with content, collaborate with other learners, and communicate with their teacher outside the classroom. Through using the CLMS over 37 weeks, Anadolu University in Turkey saw a 1418% increase in student participation by the end of 2018.

Students and instructors may use CLMS to: (1) spend more time teaching/improving one's learning performance outside the classroom; (2) facilitate person-to-person communication and encourage the interaction with tools such as forums and blogs. These helps improve communication skills and create a learning environment that is more engaging; (3) improve course organization and reduce administration; (4) with a range of automatic marking and reporting tools, to quickly and easily track and comment on students' progress. This leaves more time for teachers to concentrate on teaching [10; 25].

The St. Petersburg State University of Economics (UNECON) makes use of the Russian Moodle 3KL. The majority of training courses offered by the Department of Computer Science were created in Moodle and hosted by the university. LMS cannot replace face-to-face learning, but it is able to supplement the teaching and learning process.

As of now, there are 5 e-learning platforms dominating the Russian market:

iSpring Online is a corporate training platform with a powerful easy-to-use authoring tool. This platform differs from other digital solutions in features. It has an unlimited cloud storage. Users can upload webinars and create step-by-step learning pathways. The platform streamlines the assessment process, the instructor just uploads an electronic course (all quizzes in one presentation) and invites students. The platform gathers detailed progress statistics and engages users through gamification. In addition, iSpring publishes courses to various formats [50].

WebTutor is a solution by WebSoft for large companies with many employees such as Rosgosstrakh, Danone, M.Video, Lukoil, Svyaznoy, and Garant. WebTutor allows bringing many departments or branches together in a network; streamlining the certification process; making reports; tracking progress; exchanging information with other users via chats, forums, blogs and more [61].

Mirapolis LMS is a program designed to automate the Human Resource processes by integrating multiple systems. The platform is favored by large companies such as Gazprom, Sberbank, Rosatom, Russian Railways, Mail.ru, and etc. The platform has an unlimited knowledge database and multi-level development programs. The Mirapolis Virtual Room allows webinar recording. Overall, the app offers four learning modes: full-time, part-time, distance and blended [31].

Teachbase is a cloud LMS, which allows companies to teach their employees, partners and clients [1] but only registered users can benefit from its functionality. The platform has an authoring tool and allows users to upload PPT and PDF files, video content, and MS Office files.

Moodle is the world's most widely used LMS. This system is an open-source software application, which means that programmers can produce their own add-ins and useful extensions. Thus, the platform has plugins that enable the storage of information in a multi-level folder structure. Moodle ensures communication and collaboration (via blogs, forums, glossaries, workshops, and chats); allows tracking the learner's frequency of the LMS use and the duration of stay on the LMS; and permits portfolio attachment [66].

To sum up, the above e-learning platforms have pros and cons. The LMS's ease-of-use depends on how well the platform is adapted to the user's needs [57].

4 Results

Figure 4 below is a summary of the underlying concepts, approaches, models and principles associated with e-learning. As it can be seen, only two approaches were selected from among the existing methods, acmeological, and competence-based. The acmeological and competence-based research approach methods contribute to the identification of learners' character traits, values, life principles, abilities, and competencies [49; 42].

The key principles embraced by the model are (1) democracy (this refers to freedom and global-level integration in all spheres of life, including education); (2) technocracy (i.e., the use of technologies by society); and (3) robokratism. There is an opinion that a new class of society will form in the near future such as Robokrats, specialists in the field of information technologies and programmers. Today, these people are involved in technological and economic business management. By analytical forecasts, they may take a leading role in the society of the future.

Distance education implies the use of (1) digital learning tools (e.g., specialized and personalized electronic courses, master-classes, collaboration tools, and etc.); (2) different forms of learning process organization (i.e., education programs, cycles, practice-based learning; more detailed in Figure 2); and (3) LMS platforms [67].

Unlike the existing models of e-learning system management, the LSM model offered here takes into account the contemporary tendencies in the teaching and learning process organization, the projections of future education, and the needs of potential employers.

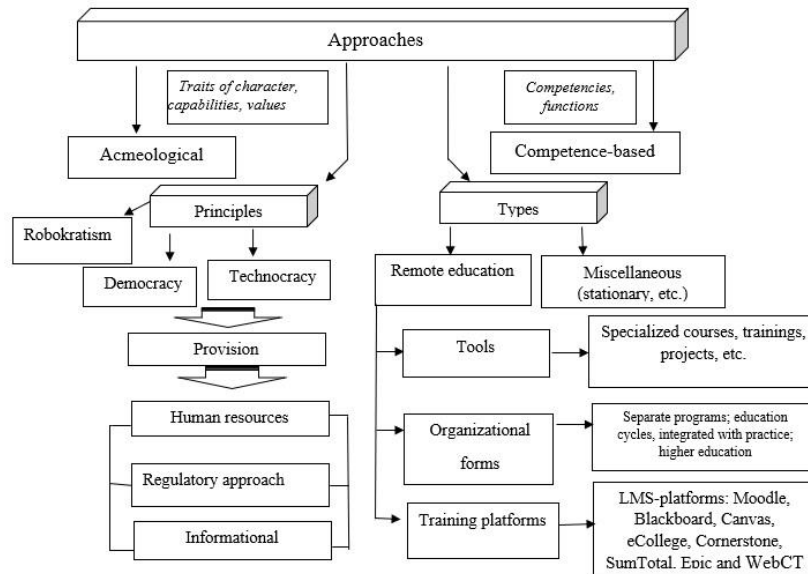


Fig. 4. The underlying model of e-learning management (created by the author)

The present management system is best implemented with respect to young generations (i.e., X, Y and Z), as they are able to adapt and perceive large amounts of information daily.

Figure 5 offers a list of tools for e-learning improvement desired by high-potential candidates of generations X, Y, and Z.

The range of preferred means constitutes teaching methods other than those implemented in a full-time class setting such as the oral presentation of material using lectures and classroom-based courses. Modern-day learners adhere to practice-oriented and engaging approaches like context-based learning, workshops, e-learning, cross-border learning, challenge-based learning, and etc. Through an interactive learning framework, learners with high expectations acquire the opportunity to gather new experience, learn foreign languages, and travel [29]. In addition, the best experience of in-company education suggests the collaborative project-based learning approach to be an effective means of teaching [85].

As mentioned earlier, many organizations focus on increasing their revenue growth rates by recruiting high-potential employees [20]. Thus, according to the Global Leadership Forecast 2018 survey, only 14% of respondent companies work to reach a strong/high-potential leadership bench, while the remaining companies are more like-

ly to have a passive attitude towards the identification of a high-potential talent [32]. Today, the global business community feels the need for identifying high-potential employees, who may have a leadership talent developed before employment, e.g., during the learning period or when participating in a family business and international projects [23].

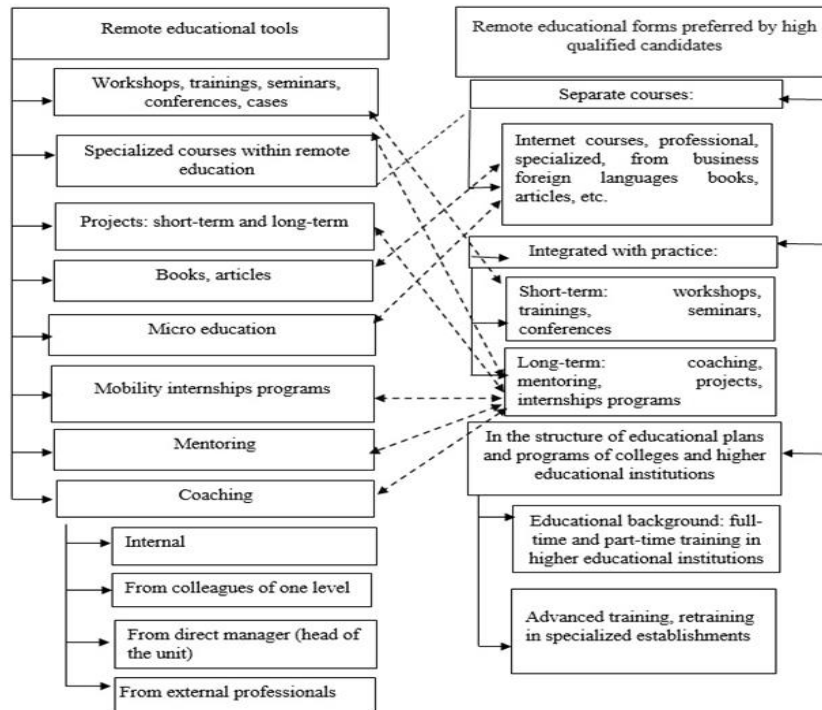


Fig. 5. E-learning development tools desired by young generations, X, Y, and Z (created by the author)

Generally, the education-related issues discussed in this study underlie the current need for maintaining the existing and forming the new HR skills in employees [45]. The overwhelming majority of high-potential specialists prefer to embark on personalized learning paths. However, many companies do not prioritize this learning approach, and therefore, investing in education may not give an expected result.

5 Discussion

With e-learning at the forefront of education, many studies have recently appeared that examine the effectiveness of education in a digital setting [74; 4]. These works offer intriguing conclusions about what makes e-learning effective and may help instructors plan the learning journey of a target audience [3]. For instance, the diversity

of e-learning approaches complicates the education quality assessment, especially in the context of informatization [24]. The solution to this problem involves developing a universal method for the evaluation of technology effectiveness. In the long run, users will be able to make learning more productive by choosing an e-learning solution based on its effectiveness and user-friendliness scores [59; 83; 41]. This is especially relevant given the diversity of LMS functionality [35; 34; 36]. Sometimes applications have a complex interface design, which requires IT skills and up to several months of free time to handle it [30]. Some software applications have a high price label, while others, sold at a lower price or free, lack a good authoring tool and have a limited range of authoring features [7]. Among other cons, authors emphasize occasional bugs and the lack of mobile apps that work without Internet access [64; 88; 89].

In general, the scientific discourse concerned with the LMS-based education focuses on finding the most appealing and effective methods of teaching. One group of scientists is concerned with how the corporate LMS software should be designed to match each generation's preferred style of learning. They recommend modifying the curriculum to make it dynamic given the distinct preferences of millennial and Gen Z users [33; 52]. Scholars also draw attention to the fact that millennials and Gen Z users appreciate the opportunity to update their skills, flexibility and independence. Both generations are accustomed to seeking information and "how-to" videos on Google and YouTube. They have a desire to actively guide their own careers. This necessitates the creation of a completely independent approach to the delivery of education [38; 46]. Another group of scientists recommends to remember that a LMS design thinking process is not linear [60; 82]. Evaluation and testing at any phase can send the process back to a previous step for refinement or to surface new ideas. As the business needs to scale and accommodate new demands, it is also crucial to correctly integrate the LMS-based learning solutions with the common L&D strategy [39].

6 Conclusion

The present findings indicate that today's younger generations learn in a different way, through technology and by using electronic sources of information, rather than paper books and one's own experience. The analytics show that students most often prefer to study remotely and educational institutions satisfy the said preferences by blending full-time and distance learning courses together. Recently, the educational institutions have faced the need for assigning personalized learning plans. Meanwhile, the business organizations require their employees to complete the mandatory training online (e.g., via new hire training programs, safety and health training programs, language learning apps, webinars, and etc).

LMS, cloud-based and self-hosted, allows integrating different objects and services into its ecosystem in order for learners to receive learning experience anytime. According to the present research, the main advantages of LMS are the advanced tracking options, the ability to communicate via a discussion board and chats, and knowledge management tools.

Findings show that the e-learning framework of education is more successful and popular among the representatives of new generations. In higher education, traditional classroom-based teaching supplemented by LMS platforms provides additional benefits and opportunities such as a set of extra courses that a learner may take whenever convenient. As it can be seen, the approach towards teaching is changing. Not only IT and online technologies transform the system of education but they also integrate with the existing learning strategies and become integral to human development.

The study proposed a number of resources desired by high-potential representatives of young generations. These resources will help develop e-learning in higher education given requirements imposed by globalization. With this information, businesses will be able to improve their Human Resource strategies by incorporating e-learning into their corporate training programs.

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