The Use of LMS and TMS in Georgian HEIs - Challenges and Perspectives

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Abstract:- The research discusses the level of advancement of LMS and TMS implementation in Higher Educational Institutions in the County of Georgia. It also shows the potential of both systems in education management, based on the international market research.

Technology integration in the education system simplifies and makes more flexible the processes that traditionally require the major human resources. Implementation of systems results not only in the processes automatization and in the wise use of existing resources, but also in storing the greatest amount of information and proper processing of data.

Having LMS and/or TMS is a prerequisite for authorization for the Universities in Georgia. Therefore, all authorized universities have implemented them. However, their functional capabilities are different, and the article discusses it in details.

In total, 20 universities operating in Georgia participated in the study. With 4 of them in-depth interviews were conducted additionally.

During the research, special attention was paid to the impact of Covid19 on changes in education management, and the paper discusses in detail the challenges faced by universities, and the path they have taken to switch from physical education to distance learning.

This study is of particular importance to universities that are considering implementing or modifying their LMSs and/or TMSs.

Keywords:- LMS, TMS, Education System, Distance Learning, Process Automatization.

I. INTRODUCTION

In modern world, with the development of technology, the need to introduce innovations into the education system is becoming increasingly clear. It is impossible to effectively manage processes in various universities without LMSs and TMSs. Process automation simplifies and makes the entire educational process more efficient. It opens up new opportunities for students, lecturers and administrative staff, as well as for employees and company managers.

During the pandemic (Covid19), it became impossible to conduct virtually educational activities without the LMS system, which once again proved the need of its implementation. To some extent, the potential of LMSs and TMSs has been partially utilized in the Georgian market, however, it is interesting to see how far they can be exploited and what positive results their large-scale implementation might bring.

The study aims on multiple topics:
➢ To investigate the potential of LMS and/or TMS implementation in the Country of Georgia based in the practices of international universities.
➢ To study the extent to which LMS and/or TMS systems have been utilized and implemented by universities in Georgia.
➢ Based on international experience, to develop recommendations on how to implement the mentioned systems in the Georgian market on full scale and get more benefits from all this.

II. LITERATURE REVIEW

According to a study published by the international company GMI (Global Market Insights) in April 2021, the size of the e-learning market in 2021 is 315 billion US dollars, which is forecasted to reach 1 trillion US dollars by 2028.

The need for distance learning urged the requirement for Learning Management System (LMS) implementation - software solution that helps universities to manage e-learning, manage content, deliver subjects to students and track their progress, automate processes and interact with users of various courses delivery in different forms. Its main task is to ensure the high quality of the user experience of students and to adapt to them. Equally significant is the training management system (TMS), which improves administrative (back-office) processes. It ensures the organization and management of lectures, the production of various statistics, and the control of tuition payment processes. Nowadays, due to the hybrid learning process, most LMS systems cover TMS components, which is why it is becoming more and more difficult to separate these two systems. For instance, all participants in the learning process have electronic access to the schedule of lectures or trainings, no matter if the meeting is held on-site or remotely.

The demand for LMS systems continues to grow – "The global learning management system (LMS) market is projected to grow from $16.19 billion in 2022 to $40.95 billion by 2029, at a CAGR of 14.2% during the forecast period." (FORTUNE BUSINESS INSIGHT – Accessed March 2022).

"The learning management system market size is expected to be among the biggest in the entire technology industry in the immediate future. With more than 700 LMS vendors in the market today, the digital learning landscape is likely to become more exciting and intense in terms of competition and upcoming technological breakthroughs." (FINANCES ONLINE - Review for Business - Accessed April 2022).

"Due to the COVID-19 outbreak, some governments have implemented stringent lockdowns, shutdowns, and movement restrictions in order to prevent the virus from spreading. Strict lockdowns, border closures, and supply chain worries functioned as barriers to deploying LMS systems on-site. However, such restrictions triggered an urgent need for remote learning, this is why LMS systems gained a high demand in 2020. Also, the commercialization of LMS is projected to result in significant market growth. The pandemic has caused companies to rethink their strategy and place a greater emphasis on solid network connectivity in order to recover consumers' trust." (ZION Market Research- Learning Management System Market - Global Industry Analysis - Accessed April 2022).

"Businesses and educational institutions are in demand to observe and track their employees' or students' learning progress to improve the overall output. Traditional methods of measuring learners' progress, such as collecting questionnaires manually or using a survey tool, are wasteful and incorrect. Manual surveys have a number of drawbacks, including time consumption, poor response rates, a lack of references or standards, and the chance of wrong responses. Organizations are unable to adequately track the efficacy of their initiatives due to time constraints and a lack of suitable assessment tools. Due to such drawbacks with traditional tracking systems, companies and institutes are adopting cloud-based LMS solutions, besides additional benefits such as low-cost investments with cloud platforms and accessibility of data at any time period at any location making cloud-based LMS a better choice for investors." (ZION Market Research- Learning Management System Market - Global Industry Analysis - Accessed April 2022).

As of 2021, the LMS market is geographically divided into 5 main regions:
➤ North America
➤ Europe
➤ Asia (Pacific)
➤ Middle East and Africa
➤ Latin America

Fig 1:- Exhibit - North America LMS Market Size in Billion USD, 2021 (FORTUNE BUSINESS INSIGHT –Accessed March 2022).

"North America is estimated to hold the largest share in the LMS Market in 2021. The region is well-connected with advanced infrastructure, which helps LMS vendors offer quality services to their clients." (Learning Management System (LMS) Market by Component (Solutions and Services), Delivery Mode (Distance Learning, Instructor -led Training, and Blended Learning), Deployment, User Type (Academic and Corporate), and Region (2022 - 2026) - (Accessed May 2022)).

"The US has a large number of colleges and universities. This factor would create a huge opportunity for the players to expand their businesses in this country. In 2020, as per the EdSurge ed-tech funding database, the U.S education technology startups invested USD 2.2 million in venture and private equity funding in 130 deals. The investment is approximately 30% higher than the previous year, which was USD 1.7 million in 2019. North America is a key contributor to market growth." (FORTUNE BUSINESS INSIGHT – Accessed March 2022).

The size of the North American LMS market is as follows:

North America Learning Management System (LMS) Market Size, 2018-2029 (USD Billion)

5.33   5.99

2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029
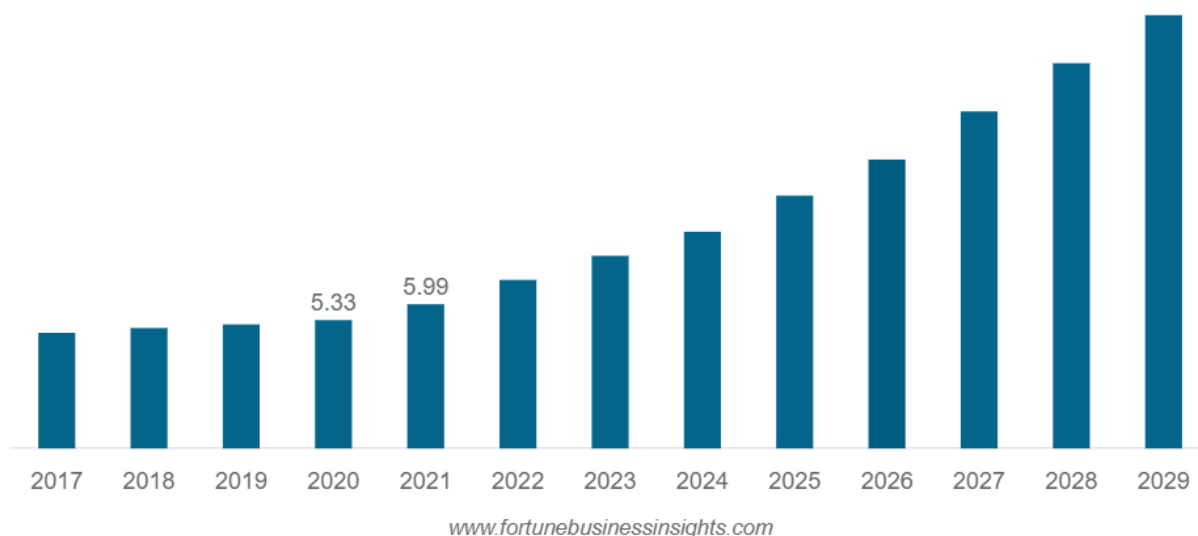
www.fortunebusinessinsights.com

Fig 2:- North America LMS Market Size in Billion USD, 2018-2029 (FORTUNE BUSINESS INSIGHT – Accessed March 2022).

"According to the European Ed-Tech Funding Report, 2021 report published by Brighteye Advisors, eht Ed Tech funding in Europe increased up to USD 711 million in 2020 from USD 652 million in 2019." (FORTUNE BUSINESS INSIGHT - Accessed March 2022).

The main LMS vendors worldwide are the following companies: Cornerstone OnDemand (USA), Blackboard (USA), D2L (Canada), PowerSchool (USA), Instructure (USA), IBM (USA), Infor (USA), Adobe (USA), LTG (Great Britain), Oracle (USA), SAP (Germany), Docebo (Canada), SumTotal (USA), Tovuti (USA), 360Learning (France), Epignosis (USA), LearnUpon (Ireland), SkyPrep (Canada), Absorb (Canada), CrossKnowledge (France), Lessonly (USA), Axonify (Canada), BizLibrary (USA), Thinkific (Canada), iSpring (USA), Blue Sky eLearn (USA), Trakstar Learn (Canada), DigitalChalk (USA), KMI Learning (USA) ௵ Moodle (Australia). (Learning Management System (LMS) Market by Component (Solutions and Services), Delivery Mode (Distance Learning, Instructor-led Training, and Blended Learning), Deployment, User Type (Academic and Corporate), and Region (2022 - 2026) – (Accessed May 2022).

For universities, it is important to have a proper understanding of their own needs and based on that make a decision on which LMS and TMS systems to implement.

It is also necessary to consider the fact, that generally universities and companies face completely different needs, and a system that fully satisfies the needs of the university, in many cases, may not be compatible with the needs of the company. However, as mentioned earlier, LMS vendors strive to have a diverse portfolio and offer different features to universities and companies. Accordingly, there are a number of LMSs that are used by both universities and companies.

Back in 2019, most universities used the LMS systems like Moodle, Blackboard, Canvas, D2L. With the following attributions presented in the table:

Table 1. Comparison of some selected LMSs (adopted from [10])

Attribution	Moodle	Blackboard	Canvas	D2L
Page	Yes	Yes	Yes	Yes
URL	Yes	Yes	Yes	Yes
File	Yes	Yes	Yes	Yes
Folder	Yes	Yes	Yes	Yes
Legend	Yes	Yes	Yes	Yes
Book	Yes	Yes	Yes	Yes
Lecture	Yes	Yes	Yes	Yes
Syllabus	No	Yes	Yes	Yes
Dictionary	Yes	Yes	Yes	Yes
Lesson plan	Yes	Yes	Yes	Yes
Video	Yes	Yes	Yes	Yes
Integration	Yes	Yes	Yes	Yes
Discussion	Yes	Yes	Yes	Yes
Chat	Yes	Yes	Yes	Yes
Reports	Yes	Yes	Yes	Yes
Inquiry	Yes	No	Yes	Yes
Comments	Yes	Yes	Yes	Yes
Blogs	Yes	Yes	Yes	Yes
Survey (question form)	Yes	Yes	Yes	Yes
Quick mail	Yes	Yes	Yes	Yes
Task	Yes	Yes	Yes	Yes
Tests	Yes	Yes	Yes	Yes
Workshop	Yes	Yes	Yes	Yes
Safe Assignment	No	Yes	Yes	Yes
Group mode	Yes	Yes	Yes	Yes
Wiki	Yes	Yes	Yes	Yes
Virtual classroom	No	Yes	Yes	Yes
Internal mail	Yes	Yes	Yes	Yes
Calendar	Yes	Yes	Yes	Yes
Tracking	Yes	Yes	Yes	Yes
Statistics	Yes	Yes	Yes	Yes
Database	Yes	Yes	Yes	Yes
Language adjustment	Yes	Yes	Yes	Yes
Certificates	Yes	Yes	Yes	Yes

Table 1:- 4 comparison of selected LMS (Moodle, Blackboard, Canvas, D2L) functions (Aldiab et al. 2018, "Utilization of Learning Management Systems (LMSs) in Higher education system: A case review for Saudi Arabia"- 2nd International Conference on Energy and Power, ICEP 2018, Sydney, Australia).

"With more than 68 million users worldwide Moodle is hands down the most widely used Learning Management System by organizations of all shapes and sizes. But Moodle is not the world's best LMS just because it's so widely used— Moodle is the world's best LMS because it is user-friendly, highly-configurable (flexible), and feature-rich. Moodle-LMS, open-source learning platform, helps you create effective online teaching and learning experiences in a collaborative and private environment. It is available in over 100 languages and is trusted by organizations and institutions, large and small." (AOSIS - Moodle: Most widely used Learning Management System (LMS) – 11.2021)

The capabilities of LMS and TMS systems around the world are different, but the main and basic functions that they combine are the following:
➢ Systems should provide processes automation - less need for human resources;
➢ the ability to manage teaching remotely;
➢ Individual adaptation to the customer;

- ➢ Variety of content - recorded videos, live videos, interactive videos, reading/presentation files;
- ➢ 24/7 learning opportunity;
- ➢ the possibility of providing information related to learning;
- ➢ Ability to write quizzes and exams in the system itself;
- ➢ Ability to automatically view the results of quizzes and exams;
- ➢ adaptation to the individual learning needs of the student;
- ➢ Automation of drawing up tables;
- ➢ Transcripts, reports, diploma attachments, etc. automatic generation;
- ➢ Production of various types of statistical analysis to improve educational and administrative processes.

Most importantly, the systems should enable companies to convey their message to customers as simply and memorably as possible, and to manage to increase users' knowledge in the most innovative ways (gamification, etc.).

LMS platform provider companies try to keep up with the users' demands and needs, but it is quite difficult to satisfy all of them. For example, in 2019, 52% of Decobo users thought that LMS systems should be integrated with other digital platforms, 51% believed that the platform created poor user experience, and the reason for 44% of the customer dissatisfaction was the cost of the program. (Research.com - 51 LMS Statistics: 2021/2022 Data, Trends & Predictions - 09.2020).

When we are discussing technological platforms, we have to note, the frequency of mobile usage worldwide. It is positively increasing while the frequency of the use of other devices is decreasing. In the American market, even in 2019, according to the data, the number of people accessing websites on mobile devices was higher than the number of people accessing websites on other devices, and the percentage was distributed as follows: 50.38% mobile; 46.11% - laptop; and 3% - tablet. (Research.com - Mobile vs Desktop Usage Statistics for 2021/2022 - 02.2021). The trend is already considered by many LMS and/or TMS providers, and some of them are already "Mobile Friendly" - the user can use the system very comfortably even on a mobile phone.

It is interesting what is happening in Georgian educational market - which LMS and TMS systems are mostly used by the Universities, how well these systems are implemented and, what can be done to improve or/and increase their efficiency.

III. RESEARCH METHODOLOGY

A mixed-method was chosen to conduct the research. More specifically, a quantitative questionnaire was sent to all officially authorized universities in Georgia (54 universities) from which, 20 universities filled out the questionnaire. At the same time, in-depth interviews were conducted with representatives of 4 university administrations.

At the initial stage of the research, after getting to know the relevant literature, the exact research questions were defined and based on it, 2 questionnaires were prepared:

- ➢ Quantitative questionnaire for universities
- ➢ Qualitative research questionnaire for universities (in-depth interview).

The following universities participated in the quantitative research:
- ➢ Business and Technology University
- ➢ Sokhumi State University
- ➢ Free University of Tbilisi
- ➢ Agricultural University of Georgia
- ➢ Batumi Shota Rustaveli State University
- ➢ Georgian Aviation University
- ➢ Tbilisi Free Academy
- ➢ International Black Sea University
- ➢ San Diego State University
- ➢ Caucasus International University
- ➢ Tbilisi medical University
- ➢ Tbilisi State Academy of Art
- ➢ Georgian Institute of Public Affairs
- ➢ Shota Meskhia State Teaching University of Zugdidi
- ➢ Georgian State Teaching University of Physical Education and Sport
- ➢ Tbilisi Medical Academy
- ➢ Alter bridge
- ➢ British Teaching University in Georgia
- ➢ Shulchan Saba Orbeliani University

As for the interviews, universities with different scales and student quotas (Georgian, foreign) were selected in order to evaluate and analyze the implemented LMS and/or TMS platforms from different aspects. In this case, the selection was based on the results of a quantitative study.

All interviews were conducted remotely using the Zoom platform, and were recorded with the consent of the interviewees.

IV. RESULTS

- ➢ *Quantitative research*

Before determining the level of adoption of LMSs and TMSs in universities in Georgia, one of the important factors was the number of years LMSs and/or TMSs had been implemented in universities.
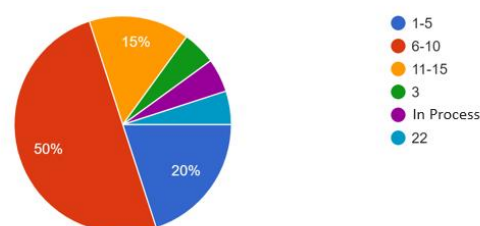

Fig 3:- Duration of implementation of LMSs and/or TMSs in surveyed universities (years)

As can be seen from the graph, 50% of surveyed universities (10 universities) have implemented LMS and/or TMS platforms for 6-10 years, 25% (5 universities) - 1-5 years, 15% (3 universities) - 11-15 years, 5% (1 university) 22 years, and 5% (1 university) - is in the process of implementation.

Most of the Universities use the following systems:

- BTU Classroom
- Ini.ge
- Smart way of learning
- Canvas, Blackboard
- Moodle
- www.portal.bsu.edu.ge
- "Goni"

Ini.ge was the most frequently repeated platform from the above systems. Currently, based on the information provided on their website, they serve 10 universities in Georgia, some of which are not represented in this study. (Ini.ge – accesses May 2022).

In addition to the systems listed above, the majority of universities have their own systems specifically tailored to the needs (developed inhouse or outsourced).

In order to determine the level of adoption of LMSs and TMSs in universities, it was also critical to have accurate information about the functionality of the implemented systems on the student, lecturer and administrative staff side. Based on the information provided by the representatives of the universities, it was determined that the systems implemented in the universities have the following functions:

Functions (Student Side)	% Indicator	Number of Universities
Access to the list of subjects and lecturers	95%	19
Knowing the minimum threshold (if any) and the maximum possible score in each component of the assessment according to a specific subject	90%	18
Access to the syllabus		
Access to information on the amount and dates of tuition paid and payable		
Ability to view the academic calendar	85%	17
Access to materials provided by the lecturer during the learning process (word, pdf, ppt files + Links)		
Ability to monitor academic progress in the learning process based on subjects		
Access to the list of courses taken, their credits and points received		
Possibility of receiving feedback from the lecturer		
Ability to give feedback to the lecturer		
Possibility of internal communication with students (individual)	80%	16
Possibility of internal communication with students (group)		
Possibility of internal communication with lecturers (individual)		
Possibility to write an application electronically		
Ability to choose a subject online	75%	15
Ability to view individual study table		
Possibility of internal communication with lecturers (group)	70%	14
Possibility of internal communication with members of the administration (individual)		
The ability of the student to track his/her own progress (this means the results of the quizzes placed in the platform after each completed chapter, which help the student understand how well he understood the topics covered)	65%	13
The possibility of internal communication between the administration and members (group)		
The possibility of requesting the necessary documentation electronically from the administration		
Access to lecturers' contact details	60%	12
Access to video lectures (pre-recorded videos)	45%	9
Availability of internal communication chats (for both individual and group communication)		
The possibility of writing the exam online in the system	40%	8
Access to lecture records		
Ability to create CV electronically on the platform	35%	7
Existence of internal communication groups (forum)	25%	5

Table 2:- Functions of LMS and/or TMS systems on the students' side in surveyed universities

As shown in the table, the majority of students of the surveyed universities have access to the list of subjects and lecturers in the systems implemented in the universities; access to the syllabus; can see the minimum threshold and maximum score in each component of the assessment according to a specific subject; can view the paid portion of the tuition fee and payment schedule. Only in few of the universities we find the function to create a CV on the electronic platform and the existence of a communication forum - only a few universities have.

Representatives of the universities indicated the additional features:
- "Generating references, employment opportunities, etc."
- "The ability to view, review and print the diploma supplement for graduates from the system."

Both of these functions are important factors for effective communication and automatization of processes.

The set of features on the lecturer's side are summarized in the table below:

Functions (lecturers' side)	% Indicator	Number of Universities
A complete list of students in each group	95%	19
The number of student groups and the schedule of lectures to be held	90%	18
Ability to specify a minimum threshold for students in each subject assessment		
Ability to upload teaching materials for students (word, pdf, ppt files + Links)	85%	17
Ability to track each student's progress		
Ability to give feedback to the student		
Opportunity to receive feedback from the student		
Ability to enter students' evaluations into the system while studying	80%	16
Possibility of internal communication with students (individual)		
Access to student contact details	75%	15
Possibility of internal communication with students (group)		
Possibility of internal communication with other lecturers (individual)		
possibility of internal communication between the administration and members (individua	70%	14
Possibility of internal communication with other lecturers (group)	65%	13
possibility of internal communication between the administration and members (group)	60%	12
Availability of internal communication chats (for both individual and group communication)	50%	10
Ability to create online exam versions in the system		
Ability to record lectures and later share them with students in the system	30%	6
Ability to pre-record a video lecture and upload it to the system for students		
Existence of internal communication groups (forum)		
Access to information on the number of lectures conducted by the lecturer and the amount of paid/payable fees	20%	4

Table 3:- Functions of the LMS and/or TMS systems on the lecturers' side in the surveyed universities

In the systems implemented in the majority of universities, lecturers see the complete list of their students; can access the number and schedule of groups; can specify minimum thresholds in subject components for students. And only a few universities have systems where lecturers can record lectures and share them with students (both live lectures and pre-recorded ones); Communicate through the forum and see information about the number of lectures they have conducted or the salaries received/deducted.

Functions (Administration's side)	% Indicator	Number of Universities
Full list of students and access to their contact details	95%	19
Access to student academic performance		
Full list of lecturers and access to their contact details	90%	18
Uploading/changing the schedule of lectures to be conducted by lecturers	85%	17
Access to subjects chosen by students (individual and in groups)		
An opportunity to share important information with students	80%	16
Ability to send feedback questionnaires to the platform for students to evaluate lecturers	75%	15
Ability to upload required documents to the platform for students	70%	14
Ability to monitor the payment of tuition fees by the student		
Access to conducted, recorded lectures and the ability to edit as needed (add/delete)	65%	13
Ability to create and edit an academic calendar	60%	12
Access to video lectures and the ability to edit as needed (add/delete)	40%	8
Ability to control plagiarism during online exams	35%	7
ability to monitor the students' progress starting with the scores obtained in the national exams before entering the university and ending with the university graduation	0%	0
possibility of monitoring the student's work experience - in parallel with his studies, where he worked in what positions and how he continued his/her career	0%	0

Table 4:- Functions of the LMS and/or TMS systems on the administration side

According to the given table, we can say that in almost the majority of universities, the members of the administration in the systems have such basic functions as: access to a complete list of students and their contacts; access to their academic records; Access to a list of lecturers and their contact information. None of the systems implemented in the surveyed universities includes the means of monitoring the student's progress, starting from the scores obtained on the national exams, till graduation from the university; Nor the possibility of monitoring the student's work experience.

The representative of one of the universities added one more - "SMS service and its statistics functions (semester: current, intermediate, final) etc."

The opinion of the representatives of the surveyed universities about the simplification and automation of processes after the introduction of LMS and/or TMS is as follows, where 1 means "not simplifying / not automating at all" and 5 "very simplifying / automating":
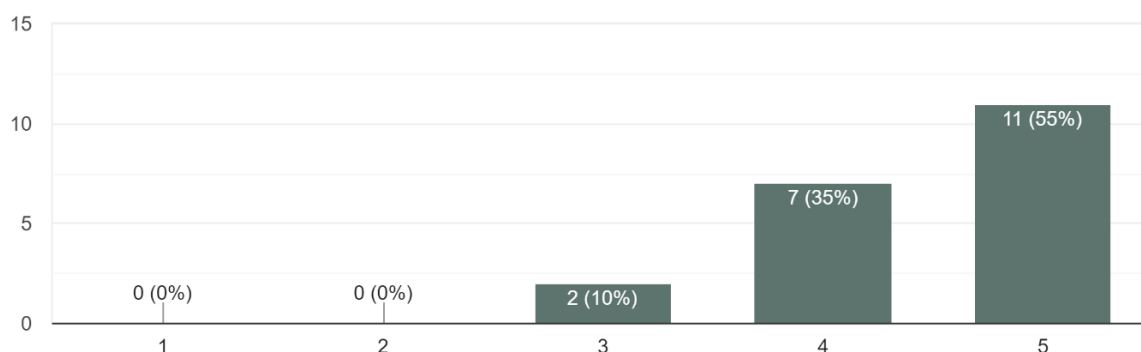
20 responses

Fig 4:- the opinion of the representatives of the surveyed universities on the simplification and automation of the processes after the introduction of LMS and/or TMS)

Out of 20 universities, 11 university representatives believe that the processes have been simplified and automated, 7 representatives think they have been simplified, and 2 university representatives have a neutral assessment of the process of simplifying and automating the processes.

When asked what has changed in universities after the introduction of LMS and/or TMS platforms, university representatives made the following comments:

- "Students' services have become more accessible."
- "Approaches have changed, "relationships" have become more flexible. Very convenient for students and professors"
- "There is a larger database and we store/analyze large volumes of information."
- "We store and process more information."
- "Improving quality management systems, improving information management, etc."
- "All the processes covered by the LMS have become much shorter, the human error factor has been reduced to a minimum, the processes have become more flexible."
- "Involvement of students in the educational process."
- "The implementation of online learning has become much easier."
- "Assessment of processes, economy of paper, speed of finding information has been accelerated."
- "Improving communication, rapid exchange of information."
- "The current system was introduced in 2013, the university has been using this system for 9 years, this system has automated many things in the years when it was introduced, today more challenges have arisen, which is why it was necessary to create and implement a new system, taking into account all the requirements that Today it stands for the university."
- "The system made it easier to communicate with students, lecturers and administration, creating a flexible unified system."
- "Since our university is of a specific nature and students are mostly athletes who are busy with training and games, not only throughout Georgia, but also abroad, due to which they often had to miss lectures/seminars, the possibility of distance learning somehow reduced the number of absences."
- "Effective management/use of time."
- "The process became faster."
- "The satisfaction of students, lecturers and members of the administration has increased."

According to the majority of the respondents, the implementation of the mentioned systems allowed them to make services available to interested parties, the processes became flexible, it was possible to store and process large amounts of information with relative ease, and ultimately, all of this increased overall satisfaction.

It is also important that the universities were able to switch to the online learning mode relatively easily through the LMS system, which was emphasized by one of the respondents. In addition, even in emergency situations, students have the opportunity to attend lectures (remotely).

In a final open-ended question, representatives of some universities shared additional information, that is summarized below:

- "When the number of programs is large, the structure includes different categories of study courses (compulsory, optional, free, minor, etc.), certain problems arise in terms of automatic selection of subjects. In this regard, problems are identified and further improvements are made."
- "VPN synchronization with the students' unified system of Education and Science (EMIS) of Georgia, reports, office, survey, contract, employment (companies offer vacancies), issuing diplomas, e-library, accounting for international mobility, individual academic load of staff, etc."
- "In addition to the learning process management system (LMS), the university has implemented a Google product called "Google Meet" for online lectures and meetings. With the consent of the lecturers, audio and video recordings are made, which are uploaded to the drive and a bank of lectures is created."
- "Our university uses zoom video communication and student base ini.ge to manage e-learning."

Above mentioned comments are quite large and contains interesting information for research.

➢ *Qualitative Research in the Universities*

In-depth interviews, which lasted an average of 1 hour with representatives of the selected universities, made it possible to ask more in-depth questions to the respondents.

The following universities participated in the qualitative research:
- Business and Technology University
- Free University of Tbilisi
- Agricultural University of Georgia
- Caucasus International University

Representatives of 3 out of 4 universities, were directly involved in the process of implementing LMS and TMS, and one, despite not being directly involved in the process, had comprehensive information regarding issues of interest to the research.

The following table provides information about the functioning of surveyed universities and the implementation of LMS and/or TMS systems:

#	University has been functioning for	LMS and/or TMS systems have been implemented for
#1	5 years	5 years
#2	11 years	7 years
#3	15 years	10 years
#4	15 years	9 years (present one)

Table 5:- Duration of operation and implementation of LMS and/or TMS in the universities participating in the in-depth study (years)

To the question why they decided to implement the mentioned systems in the university, the answers of all the respondents were almost identical in content, which can be summarized in a few points:

- Smooth and effective implementation of teaching
- The need to store and process large amounts of information
- Automation of processes
- Convenience, practicality and permanence
- Improvement of student services

In the case of 2 surveyed universities, selected systems were already used by other universities in local market and more or less met the requirements of the mentioned universities. However, later, with the involvement of developers, the systems were further refined and "customized". In the case of the remaining 2 universities, the international market was researched and the systems available in the international market were seen. After which, the company (ini.ge) was found in local market. Ini.ge helped those universities in creating system which would meet their needs. Later, the representatives of these universities gave permission to the mentioned company to allow other universities use already created soft in the future.

Systems used by the Universities are:

- BTU Classroom
- GONI
- emis.agruni
- emis.freeuni

Universities are also using Google Meet and Zoom to provide distance learning, Moodle in some universities to streamline the exam process, and in some cases a combination of Examjet and Turnitin to check written exams for plagiarism. They also actively use almost all Google products, such as Drive, Google Classroom, Calendar.

One of the universities has moved the evaluation system of lecturers completely to Google forms, however, in 2 universities, the evaluation of lecturers and subjects is completely organized in an external system and allow students to fill out the mentioned questionnaires completely anonymously. "We use our Survey Monkey. And it is branded as well. "

It is important that out of the 4 surveyed universities, in 2 of them, students are not given the opportunity to write the exams remotely, so that none of the students are focused on rewriting the exam. The Moodle system in these universities

functions only in the computers which are located in the examination center. Therefore, to write the exam, each student must appear at the mentioned place at the exact time.

The implementation of the above-mentioned LMS systems (and not only) for 2 universities (for those who already implemented the existing system) caused relatively less problems or uncertainties. "It was a normal working process" - this is how the representative of one of the universities characterizes the process. But for the other two universities the process turned out to be time-consuming. The soft was developed from scratch and there existed no previous experience. However, in the end they received software customized specifically to their needs. Due to the dynamic nature of the educational process, in the case of all 4 universities, the mentioned systems are improved and developed daily.

Ease of use of LMS systems implemented in universities was evaluated by universities as follows, where 5 means "very easy" and 4 means "easy".

#	The ease of use of the system		
	For students	For lecturers	For administration
#1	5		5
#2		4	
#3	4		4
#4			

Table 6:- the ease of use of implemented LMSs and/or TMSs in the given universities.

As shown in the table, it is easy or very easy to use the implemented systems, although it is worth noting the fact that this simplicity is determined by pre-written instructions and, in some cases, face-to-face explanation of the platform's functionality (mainly for lecturers).

One of the important aims of the in-depth interview was to determine what Covid19 has changed in terms of educational management in universities, how ready they were to meet the challenges and how quickly they adapted. Although the universities were not ready for distance learning before Covid19, all four universities managed to adapt very quickly to the circumstances through Google Meet and Zoom. Universities have adapted to pandemic environment in following ways:

- One of the universities, was able to organize the entire educational process in a digital space and transfer it to Google Meet. This platform was chosen based on the fact that all students had a corporate Gmail created by the university at the beginning of their studies, and staying with the same system was considered the best decision. Additionally, in the certain subjects, students were evaluated using the Google Classroom platform. The majority of remote exams were written by students using the internally developed platform "Exam Jet", which were checked in the Turnitin program, and in case of a high

percentage of plagiarism, the lecturer was obliged to have individual interview with the student and change the grade accordingly.

- In case of the second university, the Camtasia lecture recording program was used, which was shared with students. The seminars were held live via the Zoom program. At this university, Zoom was soon replaced by Google Meet, as the program provided the automatic possibility of recording lectures and sharing them with students. Currently, the ability to record lectures is limited, but live remote lectures are still available via Google Meet.

- The third and fourth universities, chose a different approach to distance learning and exams. A virtual university space was created, and with the help of the Zoom platform, a corresponding link was created for each "room", which always remained the same. Students were informed in which room, at what time what lecture was conducted, and any of them could "open the door" of any lecture (not only their own lecture, but also other lecture of their interest). In addition, the student's lecture schedule for each subject was automatically generated in Google Calendar. These universities chose the Zoom platform for distance learning because Zoom had additional functions that were important for the quality of teaching - for example, the role function. The study also found that Zoom had better audio support, and other benefits. As for the exams, the mentioned 2 universities showed a completely different approach in this direction as well. None of the exams were conducted remotely. As far as the mentioned situation in the country allowed, exams were held in universities in compliance with all the rules, and due to a certain period of lockdown, the exams were simply postponed for 2 months. As soon as public transport started to work again, both postponed and ongoing exams were held. Universities have chosen this way to assess students' real knowledge. In the mentioned universities, along with their exams, the teaching was immediately transferred to the physical mode, as soon as the possibility of this became real.

Currently, all the mentioned 4 universities are improving the systems implemented on a daily basis, and some of them also plan to introduce a new system. The fact that implemented LMS and/or TMS systems are not mobile friendly should be taken into account. Students can log into the systems via mobile, but it is not an app, and therefore is not convenient.

When asked how effective it would be to implement systems with similar interfaces in universities across the country, the representative of each university stated that it depends on the specific needs of the universities, and some cases it might not be effective. The implementation of the system depends not only on the desire, but also on the financial capabilities, the number of students and the structure of organizing the faculties within the university. Besides, according to representatives of universities, in today's digital generation, it is not a problem to understand new, different systems, on the contrary, it is even necessary to have similar skills for each student.

A representative of one of the universities expressed his desire to have one system at university where would be combined all other systems, which are currently used (different ones for different purposes). That would be more convenient and functional, also compatible with the systems that official bodies use (MOE, EMIS, NAEC, EQE). On the other hand, he notes that, at this stage, the implemented functionality fully meets the needs.

One of the representatives of the universities thinks that maybe the university can offer some courses to the companies to increase and clarify the knowledge of the companies' employees in LMS and/or TMS systems.

➢ *Interpretation of results*
Compared to the LMS and TMS available on the international market, systems implemented in Georgian universities have a long way to go to automate processes, and use their full potential. Nowadays, in the majority of the universities participating in the research, processing of important statistical information is done by human resources. The systems store a large amount of data; however, systems do not allow them to be used properly in decision making.

Universities in Georgia mostly use platforms which are already tested by other universities and try to adapt to them to their own needs as much as possible. In such cases the majority of them either have their own team of developers working on it, or outsource, which causes the process to take too long.

Most of the systems implemented in local universities are not mobile friendly. In a world where mobile usage far exceeds the usage of other devices and is increasing day by day.

One of the research findings was that none of the 20 surveyed universities have the possibility to track student's progress - starting from the scores obtained in the national exams before entering the university till the graduation. Also, none of the universities monitor students' career advancement systematically. The mentioned factors are very important due to the fact that, to some extent, with access to such statistics and information, the university can evaluate how well educates students with the knowledge they need to work in different companies. It should be noted that some universities have a separate career development department. Employment forums are organized to help students in job finding, but statistics of the results are not produced automatically. It is important to monitor the level of employment of students, as this is one important metric for the university to measure its success.

The systems implemented in local universities does not fully meet the needs of the learning process (especially while distance learning), which is why universities have to implement different systems to manage different processes. Because of this, the processes are split and difficult to manage.

The teaching process in Georgian universities fully conducted in live mode (both - face-to-face and remote). There are almost no pre-recorded lectures, according to which students will be able to pass any subject. Although this is explained by the fact that, according to university representatives, the content of the course is often so variable that the recorded videos lose their relevance very soon. In addition, in this case, the student cannot interact with the lecturer or students, which is one of the most important parts of the learning process.

V. CONCLUSION AND RECOMMENDATIONS

The conducted research is of a great importance, due to the fact that the demand for LMS and/or TMS platforms is growing throughout Georgia. However, universities looking to implement or replace systems face the dilemma of which platform to choose - which one best suit their needs. Many of them have not enough understanding of what systems exist in the local or international market and in most cases invest a lot of resources in the research process. The study fully responds to the goals set at the beginning of the research and will help universities or company representatives wishing to implement LMS and/or TMS to find the proper system because:

➢ The literature review section of the study discussed in detail where the learning management system market is going worldwide and how fast it is growing. The rapid growth indicates high demand for LMS and/or TMS software from universities. Demand is also increasing in terms of features, which is why vendors have to constantly improve and develop their products. Also, the literature review section clearly shows the most developed regions and countries in terms of the mentioned systems, where an interested person can start looking for LMS and/or TMS platforms for implementation in a university.

➢ As part of the research, the functionality of LMSs and/or TMSs implemented in 20 universities operating in Georgia was interviewed. Through in-depth interviews conducted with representatives of these universities, it was determined that universities use not one, but several systems at the same time to improve the educational process, which, in the main case are not integrated with each other. In addition, the vast majority of universities have a team of developers, with the help of which they develop the platform according to their own needs, and most importantly, the systems implemented in the universities are necessarily Georgian (and English, if necessary).

➢ In the course of the research, completely different needs were identified among universities due to their different structures and approaches. However, it must be mentioned, that the soft which was created by one University, later became support for other universities to implement LMSs and/or TMSs.

➢ Based on the research finding some recommendations for the Universities are:

➢ First of all, it is necessary for the universities or companies themselves Representatives are experienced in LMS and/or TMS in the platforms and their capabilities to get as many of them as possible want to introduce them.

➢ It is necessary for the universities representatives to be fully aware of capabilities of LMSs and/or TMSs which will lead them to implement more functional systems for their universities.

➢ In order to be able to use functionally diverse LMS and/or TMS platforms in Georgian language in Georgia, there is high demand needed from Georgian Universities for this service. Therefore, it is critically important many universities to be interested in international platforms that will give them the opportunity to turn their processes into one space instead of using several, independent systems to fully meet their needs.

➢ In order to popularize LMS and/or TMS platforms, the willingness of universities to participate in various researches and to openly talk about their problems.

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