Environment. Technology. Resources. Rezekne, Latvia
Proceedings of the 16th International Scientific and Practical Conference. 2025. Volume II, 189-195

National Strategies for Digitization of Higher Education: a Comparison Between Latvia and Lithuania

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***Abstract*— Digitization has impacted both countries and shown extensive potential. However, there are differences in both countries in contexts like culture, cognition, tradition, and economic performance among the two countries. The present research has thus developed a comparative scenario of the efforts taken by Latvia and Lithuania to promote and upgrade their higher education sector. This research has covered peer-reviewed data and comparative scenario of the strategic focus of the strategic focus of national strategies implemented for the digitization of Higher Education, the E-learning structure, the rate of digital and other such aspects in Latvia and Lithuania. The research found that in comparing national strategies for the digitization of higher education between Latvia and Lithuania, both countries demonstrate a commitment to advancing digital education but through distinct approaches. While Lithuania has adopted a more centralized, policy-driven strategy with clearly defined goals for digital transformation; Latvia has taken a more decentralized path, allowing individual institutions more autonomy in their digital initiatives. The research highlights that while both Latvia and Lithuania are devoted to digitizing higher education, their strategies differ in focus and execution. Latvia's all-inclusive and well-funded method may lead to instant and broad-based digital incorporation. On the other hand, Lithuania's directed approaches could cause in more comprehensive and need-specific results.**

Keywords*— *Digitization, Higher Education, Latvia, Lithuania, Higher Education Strategies

I. Introduction

Lithuania and Latvia are neighbouring countries and strong allies who have cooperation in all the bilateral contracts. Digitization has impacted both countries and shown extensive potential [1]. However, there are differences in both countries in contexts like culture, cognition, tradition, and economic performance among the two countries [2].

The study intends to develop a comparative scenario of the efforts taken by the two case countries, namely Latvia and Lithuania to promote and upgrade their higher education sector and the corresponding national strategies implemented for the purpose. Therefore, the study will cover peer-reviewed data and a comparative scenario of the strategic focus of the strategic focus of national strategies implemented for the digitization of Higher Education, the E-learning structure, the rate of digital and other such aspects in each of these countries. The specific contents of this comparative study have been discussed in the present research.

Strategic Focus is the main component of the strategic framework of a country or organization which indicates that there is clarity in the mission and vision. Moreover, the clarity in mission and vision is well-articulated in the strategy taken by the country or the organization [8], [9]. A strategic focus is very important in the process of digitization of higher education because it gives the organizations, countries or stakeholders direction a roadmap on how the goal can be achieved and the barriers that come along in the path can be overcome [10], [11]. Thus, the application of this understanding of the importance of strategic focus in higher education shows that the Baltic States comprising of countries such as Estonia, Latvia, and Lithuania have considered it as their goal to enable digitization in their higher education sector. The small size, demography and flexibility of each of these countries present a conducive environment for innovation [12]. A comparative study on the strategic focus of digitization initiatives in Latvia indicates that the country prioritizes regular assessment of the digital competencies of its students so that the loopholes can be identified and holistic education can be provided to them. The country also gives the first priority to safety parameters of digital competency development of the students so that students can learn how to use the digital

Online ISSN 2256-070X
https://doi.org/10.17770/etr2025vol2.8597

resources and platforms safely [13], [14]. Then the development of their communication and collaboration skills is prioritized. Latvia also gives importance to the deployment of hybrid teaching-learning as part of the curriculum of digital competence so that it benefits the hybrid audience [13]. The distinctive aspect of the digitization initiative of Lithuania is that its focus is on the development of digital competency among students right from the primary and secondary school levels. Simultaneously, the country makes an effort to promote adult digital competency.

TABLE 1 STATUS OF DIGITALIZATION OF HIGHER EDUCATION IN LATVIA AND LITHUANIA

Latvia		
Latvia has implemented extensive strategies to advance the digitization of higher education, emphasizing digital skills development and infrastructure improvements as part of the "Digital Transformation Guidelines for 2021-2027."		
Digital Skills Goals	• 70% of citizens with at least basic digital skills by 2027. • 45% of citizens achieving above-basic digital skills. • 3% of employed individuals working as ICT specialists	[3]
Funding and Investment	• €203 million allocated for digital skills activities, supported by national and European funding sources	[3]
COVID-19 Remote Learning Transition	• During the pandemic, approximately 23% of students in the fall semester of 2020 believed they achieved all study results via remote learning. • This increased to 34.8% in the spring semester of 2021,	[4]
LITHUANIA		
Index of Readiness for Digital Lifelong Learning	Lithuania ranks 11th among EU-27 countries with an index score of 0.623 stating its moderate readiness for digital education, institutions and policies, and the availability of digital learning	[5]
ICT Infrastructure and Training	It developed EdTech solutions in schools, the development of teacher competencies in digital education, and the training of 21,600 individuals by 2026 to acquire digital skills.	[6]
European Horizon Projects	As of 2024, Lithuania has secured €13 million in funding for 29 projects under the Horizon program (focusing on research and innovation in digitalization)	[7]

Through a unified model of Lifelong Learning System, Lithuania also promotes digitization initiatives for all learners, irrespective of their ages [15]. These focal areas are grossly missing in the digitization drive of Latvia. Nonetheless, to that of Latvia, and Lithuania also have a platform for regular assessment of the digital competencies of the students [13], [15] Another commonality between the strategic focus of the digitization initiative of both Latvia and Lithuania. The latter considers it as a core principle to teach the safe use of digital technologies as part of its digital competency development drive [15].

The major flaw in the strategic focus is Latvia is that it lacks a clear explanation of the allocation of sufficient funds for investment in digitalization. Similarly, there is dearth of availability of simultaneous training and development of academic and administrative staff. The country also fails to mention clear objectives of the digital competency development of the students in light of global education standards [14]. Unlike Latvia, Lithuania also has detailed strategies and roadmaps for promoting digitization. Along with these, the country also gets financial support from European Union Structural Funds for Lithuania for developing three major components of its digitization framework, namely, digital public services, digital access and skills, and digital infrastructure [16].

There are certain similarities in the strategic focus of both Latvia and Lithuania in terms if the development of the digital competency framework of their respective countries as well. For instance, there is a gross lack of any effort to develop a micro-credentials ecosystem where efforts will be made towards upskilling the digital competencies of the staff with proper training. There is least attention towards the development of strategies for retaining high-level digitally competent professionals [15].

II. MATERIAL AND METHODS

A. Comparison of E-Learning Infrastructure

The E-Learning Infrastructure can be understood as the total of all the components that are necessary for achieving success in digitization initiatives. Even though there are no definite ways to define the components of E-Learning Infrastructure, e-learning systems, communication applications, internet services, and electronic devices are roughly some of its vital components [17]. E-learning infrastructure is an important component of digitization in education because it plays a crucial role in improving both the quality of education and cognitive competence of the learners through the use of technologies like Learning Management Systems (LMS), electronic devices, communication applications, and internet accessibility [18]. Based on this understanding, the assessment of the E-learning infrastructure of Latvia shows that Latvia has to follow a formal framework in the sector of higher education for being a part of the European Union. One of these is the Strategic Framework for European cooperation in education and training. The purpose of this framework is to allow the exchange of best

practices in education policy, gather and disseminate knowledge and advance educational policies for initiating educational policy and reforms, both at the national and regional levels [19]. Therefore, being a part of the country European Union, Latvia also follows objectives like 'Lifelong learning' and 'Mobility a reality' as part of its E-learning initiative. Additionally, Latvia also uses digital tools for establishing social ties between teachers and students [20]. In complying with the guidelines of the EU, Latvia has widened the scope of its E-learning framework. Now, in addition to the acquisition of ICT basic skills, the framework aims to develop interactive e-resources for facilitating effective E-learning for learners of different ages. The framework also intends to develop a holistic information and knowledge society. Therefore, it integrates ICT applications in learning, teaching and dispersal of education at different levels of education (formal, non-formal and informal) [21]. However, among the bottleneck areas in the E-Learning Framework of Latvia are regional disparities in accessing and using e-Learning resources and a lack of adequate support for promoting E-Learning among adults so that they can manage their daily chores and work simultaneously [22], [23]. Thus, a distinctive feature of the E-Learning framework of Latvia is that it mainly intends to spread digital competency among adults who have not been exposed to digital skill development yet.

When compared with the E-Learning framework of Lithuania, it will be seen that the focus of this framework is mostly to encourage distance learning [24]. Secondly, both the framework of higher studies E-Learning of Lithuania is guided by the Law on Higher Education and Research of the country itself [25]. The framework does not have any connection with the guidelines of the EU which is the case for the E-Learning framework of Latvia. Another important aspect of the E-learning framework of Lithuania is that the country is making several endeavours consistently to spread its access to all the interested learners irrespective of their regional differences. This shows that the regional disparity regarding access to upgraded and digitized higher education is not a problem for Lithuania as the country promotes distance education [26]. Moreover, Lithuanian scholars constantly monitor the quality of distance education and conduct research to upgrade its frameworks [27]. On the contrary, the E-Learning framework of Latvia lacks these supportive facilities which make it difficult for adult learners to balance their education with work, life responsibilities and daily chores [22].

Even though there are differences in the E-Learning frameworks of Latvia and Lithuania, a common feature could be found in the frameworks of these case countries. Both countries integrate lots of ICT tools for knowledge gathering and dispersal and the creation of effective virtual learning environments. For instance, while the E-Learning framework of Lithuania comprises tools such as WebCT virtual learning environment, ViPS video lecturing system, the E-Learning framework of Latvia integrates tools like interactive whiteboards, computers, multimedia projectors and digital gauges [26], [28].

B. Comparison of Digital Literacy

Digital literacy is the ability of average individuals of a country to understand and use digital technology effectively in their daily life activities. It is the amalgam of specific knowledge, skills and dispositions that are integral to using digital media effectively [29]. Digital literacy is important because it develops the acumen of individuals to learn, change and adapt to the fast evolving digital world so that they become capable of mining and processing meaningful information in such a way that the knowledge can be used for solving practical problems [30]. Lithuania and Latvia are among the countries that are trying to spread the reach of digital literacy throughout the country too. The scenario of Latvia in particular suggests that in 2022, the basic digital literacy rate of the country was 50.8%. Since Latvia follows the EU guidelines of digitization competency, the statistics were 4.8% below the EU average of digital skills expected from the people of a country. In 2023, the basic digital competency in Latvia decreased further and exhibited only 45.3% of the total population of the country. The basic digital skills of the Latvian population fell further and demonstrated 32.5% of the total population [31]. The majority of the Latvian population is moderate level internet users [32]. Moreover, their average internet use and digital skills are not similar to that of the neighbouring countries of Latvia with similar GDPs like Estonia and Lithuania [33].

A focused comparison of the digital literacy of the case country Lithuania suggests that this neighbouring country of Lithuania has 93% digital competency [33]. This shows that a quarter of the population of Latvia lacks basic digital skills like reading, counting and interpreting digital data [33]. A statistical database by the Ministry of the Economy and Innovation of the Republic of Lithuania, [34] from 2023 further shows that in Lithuania basic digital literacy is highest among people of age groups 16 to 24 years old. 81.28% of this group has digital literacy. This is followed by the age group of 25-34 years with 78.41% digital literacy. The digital literacy is lowest in the Lithuanian population belonging to the age group of 65 to 74 years whose competency represents only 15.15% of the population [34]. Thus, a comparative study of the digital literacy of Latvia and Lithuania shows that the average population of Lithuania has higher digital literacy as compared to that of Latvia.

Following table presents a comparison between Latvia, Lithuania and EU average on basic digital literacy-

TABLE 2 BASIC DIGITAL LITERACY- LATVIA VS LITHUANIA VS EU AVERAGE

Category	Latvia	Lithuania	EU Average
People with Basic Digital Skills (Age 16–74)	45%	52.90%	55.60%
ICT Specialists in Workforce	2.80%	4.90%	4.80%

Sources: [35][36]

Following table presents a comparison between Latvia, Lithuania and EU average on digital skill development-

TABLE 3 DIGITAL SKILL DEVELOPMENT- LATVIA VS LITHUANIA VS EU AVERAGE

Matric	Latvia	Lithuania	EU Average
Basic Digital Skills (% of population)	48%	50%	54%
Above Basic Digital Skills (% of population)	24%	28%	26%
ICT Specialists (% of total employment)	2.80%	3.70%	4.60%
ICT Graduates (% of all graduates)	3.20%	5.10%	3.90%
Adults in ICT Training (% of population 25–64)	8%	9%	11%
Use of Internet for Online Learning (% of internet users)	22%	24%	27%
Participation in Digital Up skilling (Last 3 months)	17%	21%	23%

Source: [35], [37]

It can be inferred from the above table that Lithuania slightly outperforms Latvia. But EU average outperforms both the countries.

Further, the table below presents the availability of online courses- Latvia vs Lithuania-

TABLE 4 AVAILABILITY OF ONLINE COURSES-- LATVIA VS LITHUANIA

Metric	Latvia	Lithuania
Share of internet users engaging in online learning activities (2022)	27.78%	32.17%
Adult participation in lifelong learning (2022)	9.70%	27.40%

Sources: [38], [39]

It can be inferred from the above table that Lithuania outperforms Latvia when it comes to online course users. Also, the adult population participation in using online courses is also higher than Latvia.

III. RESULTS AND DISCUSSIONS

A. Distance Learning

Distance learning is a form of teaching-learning session in which there is no physical classroom. There is no need for the learners to be physically present in any traditional form of classroom to undergo any course [40]. Technology plays a crucial role in facilitating distance learning because educators and learners are spatially separated from each other in this format of learning. So, they depend upon digital technology and multimedia for setting up distance learning classrooms [41]-. Distance learning has been chosen as a factor for comparison between the case countries because it breaks the formal barriers of higher education and gives greater scopes to the learners for pursuing further education [42]. In Latvia, only 10% of all off-site students were undergoing distance education courses in 2010-2011. Again, the Latvia's Sustainable Development Strategy 2030 was taken around 2012 to include universities for training programs fully based on distance education. During that time, five universities, ten institutions of higher education and three colleges were already running courses through distance education. In addition, a private institution was offering studies exclusively through the mode of distance education [43]. According to the report of the Ministry of Education and Science, there had been a drastic rise in distance education in 2020 with an average growth of 20% of such institutions. Distance education has been taken up at the secondary level has been taken up by many schools in Latvia over the past few years post COVID situation. The number of showing interest in distance education has also increased by 30% in the post COVID years [44]. In the case of adult education, Education Development Strategy of Latvia considers distance learning mode as ideal [45]. However, the country is a strong supporter of the importance of physical institutions specifically in the case of school level education [44]. A comparative scenario of distance education in Lithuania shows that Lithuania also has a long history of distance education. The top universities in the country such as Kaunas University of Technology, Lithuanian University of Health Sciences, LCC International University, Kazimieras Simonavicius University, Vilnius University and Mykolas Romeris University have at least one distance learning program for their students. These institutions have around 700 to 1500 student enrolment [46]. Mykolas Romeris University (MRU), which is the leading institution of Lithuania has around 7500 students enrolled in their distance learning courses [47]. A major inference drawn from the data presented so far is that even though distance learning is encouraged in both countries is encouraged, Lithuania has a stronger foundation with a much higher percentage of student enrolment in various distance learning technical courses than Latvia.

B. Research And Innovation

While research is the systematic process of generating new knowledge, innovation is improvising this new knowledge and making it appropriate for solving practical problems [48]. Research and innovation are important for measuring the level of progress of any educational institute or any education system and assessing their compatibility with global standards [49], [50]. Assessment of the level of research and innovation in the educational sector of Latvia shows that the country has developed the STDI policy for the year 2021-2027 to develop a new base and generate new knowledge for the development of high-quality research based educational system that would lead to creative and skilful society. The policy also aimed to develop sustainable human capital for the country [51]. Since 2011, there has been 221% increase in invesment in Research and Development. The majority of R&D projects in the country take place in

higher educational institutions and research institutes. Currently, there are 62 registered research institutions in the country. 22 of these institutes are publicly owned and funded by the Latvian government. The niche areas of R&D in Latvia are Biomedicine and pharmaceuticals, Smart materials and photonics, Information and communication technologies and Agriculture and life sciences [52]. Nonetheless, even though there are earnest efforts of Latvia to promote research and development, R&D in the higher education system in particular remains connected with the EU funding cycles. Hence, longer-term R&D planning becomes difficult. Therefore, the role of the Latvian government becomes vital here in boosting overall investment in R&D in the higher education sector to enable the innovation capacity of the private institutions [53]. On the contrary, in Lithuania, the investment in R&D activities for fostering technological development is very low. Contrary to Latvia where the effort of Latvian government is seen, the growth of investments in R&D in private sector of Lithuania is also very low [54]. The reason is, 54.9% of the investment in R&D is EU funded and meant for the business sector. Moreover, as the EU funding is mostly aimed at fostering income scopes, the least attention is given to innovation. Therefore, the technological development policies taken in Lithuania fail to ensure a breakthrough in innovation [54]. The Lithuanian government also makes up only 1% of their GDP in R&D in the sectors of education and technology [55]. These aspects make the pace of R&D very slow in Lithuania as compared to Latvia.

C. International Collaboration

International Collaboration must be understood as a form of strategic cross-border partnership between countries so that both parties mutually benefit [56]. In the educational sector, international collaboration brings innovation through the flow of new knowledge. This enhances the academic quality of the educational institutes and gives them global recognition [57]. Lithuania actively collaborates with international organizations like NATO and the EU to promote human rights and democracy. The country also collaborated with Latvia and Estonia to secure their positions in the face of the risks presented by Russia [58]. The country also encourages international collaborations with other countries and welcomes students from abroad to study in Lithuanian academic institutions. This strengthens the health of the Lithuanian tertiary education sector [59]. While Latvia already maintains international collaboration with Lithuania to maintain its safety against Russia [58]The country's universities also actively engage in international collaboration to facilitate international identification, enable information and knowledge exchanges, and strengthen their good reputation. It has active bilateral partnership agreements with 233 universities located in 53 countries and regions of the world. Latvia has recently signed 1020 international agreements with 447 institutions under 33 European programmes. Additionally, Latvia has signed and 38 Inter-institutional agreements with 17 partner countries to improve its educational sector [60]. Thus, while efforts to establish international collaboration can be noticed in the case of both countries, Latvia has a more proactive approach whereby it consistently enters into regular bilateral partnership agreements. In the case of Lithuania, there is more interest for internationalization to promote qualitative improvement of the educational sector.

Overall, both countries are facing many challenges when it comes to digitalization of higher education. Following table summarizes these challenges-

TABLE 5 CHALLENGES OF DIGITALIZATION OF HIGHER EDUCATION- LATVIA VS LITHUANIA VS EU AVERAGE

Metric	Latvia	Lithuania	EU Average
Basic Digital Skills (% of population aged 16–74)	45.30%	52.90%	55.60%
Above Basic Digital Skills (% of population aged 16–74)	24%	23%	26%
ICT Specialists (% of total employment)	4.40%	4.90%	4.80%
Enterprises Providing ICT Training to Employees	15%	Data not specified	22%
5G Coverage in Populated Areas	53.10%	98.90%	89.30%
Adoption of Cloud Computing by Enterprises	Increased by 14.3% in 2023	33.6% of enterprises use cloud services, below EU average of 38.9%	38.90%
Adoption of Artificial Intelligence (AI) by Enterprises	Data not specified	4.9% of enterprises use AI, below EU average of 8%	8%

Sources: [61]–[63]

IV. CONCLUSION

A comparative scenario of the higher education sector of Lithuania and Latvia was provided to understand the need and significance of digitization in them. The research conducted a comparative study and found distinctive differences between Latvia and Lithuania in the infrastructure, funding, focus and other aspects. It was found that fund allocation in higher education is not clearly mentioned in Latvia whereas Lithuania has a clear guideline in this aspect. In Latvia, fund allocation in higher education often lacks clear and transparent guidelines, making it challenging to track how resources are dispersed across institutions and programs. By contrast, Lithuania has developed a more structured

approach to funding higher education. Lithuania's funding model includes clear distribution guidelines and often includes a mix of state funding, competitive grants, and performance-based financing. This structure is intended to support funding with strategic intentions like quality developments, research results, and institutional effectiveness.

In Latvia, the lack of consistent guidelines can lead to discrepancies in how organizations receive and exploit their funds, possibly affecting the quality and attractiveness of their higher education system. The Lithuanian model might offer Latvia a outline for generating a more transparent and performance-oriented funding system, helping stakeholders through clear standards and answerability

Again, Lithuania promotes digital competency from the school level, but the focus of Latvia is on adult digital competency development. However, Latvia is proactive in terms of international collaborations to boost the educational sector. Further, Latvia makes considerable investment in R&D in the higher education sector.

In comparing national strategies for the digitization of higher education between Latvia and Lithuania, both countries demonstrate a commitment to advancing digital education but through distinct approaches.

The present research will serve as a comprehensive literature on understanding different digital education models of Latvia and Lithuania. This research will facilitate the stakeholders in understanding government policies impact higher education digitization in both the countries. Finally, it can help both countries to get insights on the scope to improve their higher education systems.

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