“Assessment of implementation of smart university management system: The case of Kazakh Ablai Khan University of International Relations and World Languages”

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ARTICLE INFO	Aliya Seitbatkalova, Saltanat Tamenova, Bulent Tarman, Saken Mukan and Elmira Yeralina (2023). Assessment of implementation of smart university management system: The case of Kazakh Ablai Khan University of International Relations and World Languages. *Problems and Perspectives in Management*, *21*(1), 504-514. doi:10.21511/ppm.21(1).2023.43
DOI	http://dx.doi.org/10.21511/ppm.21(1).2023.43
RELEASED ON	Tuesday, 04 April 2023
RECEIVED ON	Saturday, 26 November 2022
ACCEPTED ON	Tuesday, 28 March 2023
LICENSE	This work is licensed under a Creative Commons Attribution 4.0 International License
JOURNAL	"Problems and Perspectives in Management"
ISSN PRINT	1727-7051
ISSN ONLINE	1810-5467
PUBLISHER	LLC “Consulting Publishing Company “Business Perspectives”
FOUNDER	LLC “Consulting Publishing Company “Business Perspectives”

NUMBER OF REFERENCES	NUMBER OF FIGURES	NUMBER OF TABLES
50	0	7

BUSINESS PERSPECTIVES

LLC "CPC "Business Perspectives"
Hryhorii Skovoroda lane, 10,
Sumy, 40022, Ukraine

www.businessperspectives.org

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ASSESSMENT OF IMPLEMENTATION OF SMART UNIVERSITY MANAGEMENT SYSTEM: THE CASE OF KAZAKH ABLAI KHAN UNIVERSITY OF INTERNATIONAL RELATIONS AND WORLD LANGUAGES

Abstract

The effective functioning of a smart university management system significantly improves higher education institutions' competitiveness. This study aims to assess the implementation of a smart university management system on the example of Kazakh Ablai khan International Relations and World Languages University. The paper considers elements of a smart university system (smart learning technology infrastructure, smart faculty staff, and smart students) from the university managers' and students' viewpoints using the stepwise algorithm to raise the university's competitiveness. During the study, 2700 students were surveyed to assess the implementation and operation of smart systems at the university, and ten experts (the expert team consists of deans and head of departments) were interviewed to identify the weights of each element. The survey results showed that the technology infrastructure for smart learning at the university is at a lower level (50%) than the competence of the teaching staff (60%) and students (89%). Furthermore, based on standardized factor scores and the weighted average, the implementation level of a smart university management system is low – C (0.498), where the weighted assessment of smart learning technology infrastructure is 0.2, smart teaching faculty – 0.19, and smart students – 0.108. According to the results, the university management needs to develop the smart learning technology infrastructure (free Wi-Fi, smart education environment, and smart classrooms) and improve the qualifications of its teaching staff (knowledge and skills, content of the courses, and educational process).

Keywords smart learning, technology infrastructure, smart teaching faculty, smart students, Kazakhstan

JEL Classification M12, M15, O31

Received on: 26th of November, 2022
Accepted on: 28th of March, 2023
Published on: 4th of April, 2023

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Conflict of interest statement:
Author(s) reported no conflict of interest

INTRODUCTION

The strategic objective of a modern university is to increase its competitiveness in the educational services market, which is a challenging task for university management. Different tools may be used in achieving competitiveness, such as increasing the quality of educational programs, motivating faculty staff, pricing policy, location of the university, and introduction of the smart university concept. The implementation of the smart university concept requires new research technologies. The smart university management system (SUMS) is an effective tool for assessing the assimilation of smart university elements. The increase in university competitiveness is influenced not only by the SUMS elements but by their healthy functioning, which leads to continuous improvement of staff qualifications; students' demand for specific knowledge and educational services; and high rank-

http://dx.doi.org/10.21511/ppm.21(1).2023.43

ing of the university among competitive universities. Effective functioning of its elements, namely smart learning technology infrastructure (SLTI), smart faculty staff (SFF), and smart students (SS), has a vital role in improving competitiveness in higher education institutions and formation of a smart learning environments (Mutizwa et al., 2023).

The unique pattern is that the very design of the smart control system has already attracted much attention from students and teachers, who note that the education system has changed dramatically during the COVID-19 pandemic. It should be noted that the topic of smart university management is relatively new, which, in turn, requires even more detailed qualitative investigations to improve smart learning. There is limited research on the successful implementation and operation of SUMS and its impact on the ability of universities to compete, especially in Kazakhstan.

The principle of progression of KazUIR&WL is looking back at the old and current teaching traditions, using all the best and innovative methods of teaching. The university teaches 14 different world languages using innovative technologies and the basic postulates of smart education; this scientific and educational institution is a multidisciplinary recognized place of learning, one of the top five universities of the Republic of Kazakhstan, graduating leaders in their field. The strategic course for university development is based on the concept of a smart university (KazUIR&WL, 2023). In this regard, there is a need for a tool for assessing the implementation level of a smart university management system to identify bottlenecks and develop management decisions for creating a smart university.

1. LITERATURE REVIEW

Considering technology development and the implementation of its results in the higher education sphere, innovative educational technologies contribute to strengthening the position of universities not only in the local but also in the global markets. In addition, applying the smart university concept in the context of a pandemic has become necessary (Pu et al., 2022), forcing universities to quickly switch to a new system and adapt to market requirements and conditions.

The COVID-19 pandemic has triggered the rapid development and use of smart devices and innovative technologies in the educational field globally (Czerniewicz, 2020; Tarman, 2020). However, the rapid transition from offline to online mode revealed the incompatibilities and shortcomings of distance learning, caused by equipment and human factors (teachers' lack of experience in online teaching or disorganization of the workspace in a home environment) (Evans-Amalu & Claravall, 2021; Hoe et al., 2021; M. Mahlomaholo & S. Mahlomaholo, 2022; Marongwe & Garidzirai, 2021). Despite the initial problems, the most crucial task was ensuring that education's quality and efficiency stayed the same (Murgatrotd, 2020). The above problem is relevant, the solution of which should be directed to the funds and forces of not only educational institutions but also the state; only in this case it will be possible to create a safe space for students where all standardized protocols are collected for both the student and teacher (Du & Lin, 2012). For the successful functioning of this smart space, teachers and university administration must continuously improve their skills not only in their profession but in innovative educational technologies to navigate online education and help students who find these changes difficult (Lubinga et al., 2023; Okwara & Pretorius, 2023).

Smart education is a concept that integrates the effective functioning of technologies responsible for communication and information dissemination/retrieval, the purpose of which is to achieve the best effect in the learning process, the asset of which is the teacher and his orientation (Keykha, 2022). Coccoli et al. (2014) add that smart education directly depends on the smart learning environment, which includes various smart devices. It should be noted that universities are equipped with new innovative educational technologies that successfully operate through cloud services in updated and modernized interactive smart environments. Smart education components include sociability, interaction between administrator-teacher-student, data exchange, management

of the educational process, smart environment security, and IT innovation. A smart learning system is an effective and engaging learning process using smart devices and information technology to improve online learning quality, including motivation and interest (Saleem et al., 2022). It is impossible without an e-learning-supportive system and experience (Vesin et al., 2018). The main task of smart learning is to create conditions for the sustainable development of higher educational (Dube et al., 2023; Pu et al., 2022).

A university is smart if it uses technology innovation (IoT, big data, Green-ICT, AI, cyber security, e-learning, smart device, cloud computing, etc.) to achieve its mission (Rico-Bautista, 2019; Mbombo & Cavus, 2021). A university 4.0 model is characterized by virtual learning, global competencies, and intuitive technologies to gain knowledge anywhere and anytime on any platform. SMART university system consists of 5 elements: SMART goals, SMART environment, SMART processes, SMART support, and SMART abilities (Kazieva et al., 2021). According to Keykha (2022), a smart university includes ten components: smart academic entrepreneurship (consulting and interaction with industry), smart campus (smart classes and smart environment); smart capacity building (hard and technology infrastructure); smart finance (smart financial management), smart governance (intelligent leadership), smart human resources (smart employees, smart faculty stuff, and smart students), smart modern management (smart management in universities), smart pedagogy (smart learning, smart teaching, and smart assessment), smart research (intelligence of research), and smart technologies (technical-statistical and smart rules).

Today, a smart university system is vital (Nguyen et al., 2022). Developing a smart university system is possible by creating a smart campus (Valks et al., 2021) or forming separate components of a smart university with their further integration. Within the smart university system, there are such management systems as the smart university library management system (Muhamad & Darwesh, 2020), smart university student information management system (Jain et al., 2017), and smart university learning management system. Converting a traditional university into a smart one requires planning its transformation strategy and the interaction of physical, technology, and human resources (Rico-Bautista et al., 2021). When moving to the concept of a smart university, university management should initially pay attention to building such components as smart learning technology infrastructure, smart faculty staff, and smart students. This process also requires the development of tools to evaluate the implementation level of a smart university management system.

This empirical study aims to assess the implementation level of a smart university management system on the example of Kazakh Ablai khan International Relations and World Languages University (Almaty, Kazakhstan). This study seeks to answer the following research questions: What is the implementation level of the smart university management system in KazUIR&WL? What are the features of university development within the smart university concept? What measures to develop smart university management system are needed?

The aim of this empirical study is to assess the implementation level of smart university management system on the example of Kazakh Ablai khan University of International Relations and World Languages (Almaty, Kazakhstan).

2. METHODOLOGY

The implementation level of the smart university management system can be assessed through its elements (smart learning technology infrastructure, smart faculty staff, and smart students). This can be evaluated from the university managers' and students' viewpoints. The research methodology involves the use of primary data. This study interviewed ten experts who have experience teaching at the university (for more than five years) to identify the weight of each element to remove all possible inconsistencies in the analysis of the values of the extreme proportion, to regress the factor of the uncertainty value. The expert team consists of deans and head of departments.

The main participants of the study were students receiving knowledge and services in an educational institution. According to the KazUIR&WL

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(2023), in 2021–2022 academic year, there were 6,000 students enrolled for the first semester. In this regard, at least 362 respondents should be randomly observed (calculated based on the sample size calculator, confidence probability – 95%, confidence interval ± 5 %). Therefore, the study sampled 2700 students (Table 1).

Table 1. Demographic data

Item	Option	Number	Percent
Age	16-21	1,890	70
	22-35	567	21
	36-55	243	9
Gender	Female	2,214	82
	Male	486	18
Level of study	1st-year student	810	33
	2nd-year student	594	22
	3rd-year student	648	24
	4th-year student	324	12
	master student	216	8
	doctoral student	27	1

A survey is a primary method used to collect students' opinions on the implementation and operation of smart systems at the university. The survey was conducted online. The questionnaire was created on Google Forms and distributed through corporate mailings. It consists of two parts. The first part collected general information about students as participants in the survey. The second part consisted of three sectors, which included 19 questions about smart learning technology infrastructure, smart faculty staff, and smart students in KazUIR&WL.

A Likert scale questionnaire (Armstrong & Kotler, 2017) was used in the study. It helped to group the opinion of participants where 1 is "completely disagree" and 5 is "completely agree." The survey results were used to verify the validity of the conclusions.

The stepwise algorithm for raising the university's competitiveness was used to analyze the current implementation level of elements of the smart university system (Mynzhanova et al., 2018). This algorithm consists of five steps:

1. Assessment of the implementation of each element.

To assess the implementation of each element of smart university management, obtain standardized factor loadings, and calculate the weighted mean of the three elements, the following equation was used:

$$D_i^k = \frac{d_{i3}^k + d_{i4}^k + d_{i5}^k}{\sum_{j=1}^{5} d_{ij}^k} \quad (1)$$

where, D_i^k weighted mean; d_{ij}^k the number of students who rated each unit of study; i question number of smart university elements k-th block, where $k = 1$ smart learning technology infrastructure, $k = 2$ smart faculty staff, $k = 3$ smart students.

2. Calculation of volume of the unit under study and, accordingly, all the characteristics of the matching element.

After analyzing and estimating the students' opinion by using the formula 1 about the implementation of three elements of SUMS, the experts were asked to rank the importance of each group of elements to identify the weight according to their preferences.

3. Analysis of the totality of the implementation of each unit and its volume.

To analyze the volume of each factor, the study used the formula:

$$\mu_i^k = \frac{\mu^k}{\varphi^k}, \quad (2)$$

where μ_i^k – the weight of the i-factor of the k element, ϕ^k – number of questions in the k-element.

In analyzing and considering the volume of the factor of each study unit (block), it was proposed that these units would have an identical volume among the study elements. However, if different volumes are registered within each block of the unit, a method should be used that considers the concepts of expert analysis.

4. Evaluation of the implementation of each element of the smart university management system.

5. The assessment of the implementation of indicators for the i-th factor of the k-th element of elements of SUM by taking into account its weight (K_i^k) is determined by:

$$K_i^k = \mu_i^k \cdot D_i^k. \quad (3)$$

6. General assessment of the rating university according to the element implementation level of the smart university management system.

A general assessment of university competitiveness based on the implementation of elements of SuM system is calculated based on:

$$R = K^1 + K^2 + K^3. \quad (4)$$

The ranking-rating assessment based on the effective functioning of different systems SuM is determined using formula 4. In this assessment, not only the assessment threshold in the traditional format is involved, but also the introduction of the volume of the studied values. The threshold is 0.51 points. In the interval between 0 and 1 is the level of performance on the implementation and successful operation of SUM in the university participating in the study. The rating is distributed according to the success of the SUM implementation in the difference from 0 to 1 according to the proposed results (Table 2).

Table 2. Distribution of university rankings according to the effectiveness of the implementation and operation of the SUM system

Grade		Position	Rating	Rating value
A	A+	High	0.81-1.0	0.95-1.0
	A			0.91-0.95
	A–			0.81-0.9
B	B+	Medium	0.51-0.80	0.71-0.80
	B			0.61-0.70
	B–			0.51-0.60
C	C	Low	0-0.50	0-0.50

The results of expert ranking and questionnaires were processed using the Excel program. The main characteristic of the proposed method is an integrated approach to analyzing the degree of SUMS implementation and functioning. A primary way of collecting data to implement this algorithm using the quantitative research method helps to explain the meaning of variables, which in particular facilitated complex phenomena. According to the obtained data, the rating scores were comparative; a flexible algorithm is used to classify the university according to the rating system in terms of its SUMS effectiveness.

3. RESULTS

According to the 5-stepwise algorithm for raising the university's competitiveness (Mynzhanova et al., 2018), Table 3 shows the assessments of the implementation of each SUMS element: smart learning technology infrasructure (element 1), smart faculty staff (element 2), and smart student (element 3). The study results are generally positive, especially the availability of smart classrooms equipped with advanced technologies in teaching (Table 3).

Table 3 shows that the students estimated the level of smart learning technology infrastructure at this university to be around 50% (factors 1, 2, 4, 5) but most participants were not satisfied with the created smart environment and access to free Wi-Fi that support smart learning process (0.37 and 0.29).

The results of the second element of the study – smart faculty staff – are presented in Table 4.

Table 3. Effectiveness of smart learning technology infrastructure (SLTI)

No.	Factor	Number of surveyed participants					Total number of participants	Analysis results D_i^1
		Completely disagree	Partly disagree	Partly agree	Agree	Completely agree		
1	2	3	4	5	6	7	8	9
1	SLTI1	872	400	518	413	497	2,700	0.52
2	SLTI2	1,012	496	482	310	400	2,700	0.44
3	SLTI3	1,264	424	394	205	413	2,700	0.37
4	SLTI4	1,042	488	427	335	408	2,700	0.43
5	SLTI5	1,031	445	467	332	425	2,700	0.45
6	SLTI6	1,568	336	305	194	297	2,700	0.29

Note: SLTI1 – The university has smart classrooms (specialized for the study of the subject, equipped with advanced technologies in teaching); SLTI2 – The university has a smart campus (equipped with innovative technologies that facilitate students' learning); SLTI3 – Smart campus, which is equipped with digital technologies; SLTI4 – Classrooms are equipped with smart tools (smart boards, smart computers, smart workbench, or special software); SLTI5 – Classrooms or rooms are equipped with innovative digital technologies; SLTI6 – The university provides free Wi-Fi that supports smart learning.

http://dx.doi.org/10.21511/ppm.21(1).2023.43

Table 4. Effectiveness of smart faculty staff (SFS)

No.	Factor	Number of surveyed participants					Total number of participants	Analysis results D_i^2
		Completely disagree	Partly disagree	Partly agree	Agree	Completely agree		
1	2	3	4	5	6	7	8	9
1	SFS1	621	437	464	503	675	2,700	0.60
2	SFS2	675	370	587	445	623	2,700	0.61
3	SFS3	800	456	446	464	534	2,700	0.53
4	SFS4	642	413	540	405	700	2,700	0.61
5	SFS5	791	437	437	497	538	2,700	0.54
6	SFS6	691	467	492	464	586	2,700	0.57

Note: SFS1 – Teaching staff is smart (teachers know how to use innovative technologies in smart classrooms); SFS2 – Teaching staff actively uses innovative technologies in the learning process; SFS3 – Teaching staff uses a smart classroom or other smart components in the learning process; SFS 4 – Teaching staff uses smart technologies during theoretical classes (lectures); SFS5 – Teaching staff effectively uses the study time in the classroom with the help of smart technology; SFS6 – Teachers use special software in the online/offline classroom.

According to Table 4, a large number (60%) of students agree that teaching staff can be considered smart (factors 1, 2, and 4), while the results of factors 5 and 6 estimate them slightly less than above. On the other hand, only 53% of students were satisfied with the use of smart classroom by faculty staff. Next, Table 5 shows the factors devoted to evaluating the level of self-assessment by students.

Table 5 presents the highest result obtained among all three groups of elements except factors 5 and 6. 89% of students that participated in this survey use smartphones to support their learning during classroom classes at the university and outside the university and 76% of them use laptops. On the other hand, only 58% of students indicated that teachers use innovative smart technologies that allow them to improve their knowledge and skills. Slightly lowest results were observed in factor 6 (53%), which showed that not many students attend major and minor programs to become smart students.

Experts ranked the importance of each group of elements using:

$$\grave{A_1} > \grave{A_2} > \grave{A_3}, \tag{5}$$

where, A_1 – Smart learning technology infrastructure, A_2 – Smart faculty staff, A_3 – Smart students, > – sign of preference.

According to experts, the weight of smart learning technology infrastructure is 50% proving the

Table 5. Effectiveness of smart student (SS)

No.	Factor	Number of surveyed participants					Total number of participants	Assessment results D_i^3
		Completely disagree	Partly disagree	Partly Agree	Agree	Completely agree		
1	2	3	4	5	6	7	8	9
1	SS1	435	332	504	497	932	2,700	0.71
2	SS2	146	147	286	451	1670	2,700	0.89
3	SS3	392	253	376	416	1263	2,700	0.76
4	SS4	454	405	467	515	859	2,700	0.68
5	SS5	742	383	466	415	694	2,700	0.58
6	SS6	918	348	540	370	524	2,700	0.53
7	SS7	548	348	515	600	689	2,700	0.66

Note: SS1 – I actively and successfully use innovative technologies in my studies; SS2 – I use a smartphone to support my learning during classroom classes at the university and outside the university; SS3 – I use a laptop to support my learning during classroom classes at the university and outside the university; SS4 – I use special software to support my studies during classroom classes at the university; SS5 – I attend classes where teachers use innovative smart technologies that allow me to improve my knowledge and skills; SS6 – I attend major and minor programs that allow me to deepen my knowledge and practical skills; SS7 – Teachers use collective learning and project-oriented training, which allow me to master the educational material in depth.

Table 6. Comparison of elements

The element of the SUMS (B)	A_1	A_2	A_3	Total	Volume of each element, μ^k
1	2	3	4	5	6
A_1	1	1	1	3	0.5
A_2	0	1	1	2	0.3333
A_3	0	0	1	1	0.1667
Total				6	1

importance of technology infrastructure in implementing SUMS. The second place (33.33%) belongs to smart faculty staff because the teachers actively use innovative technologies. According to the experts' opinion, the university's goal is to train students. Also, the students are the final users of educational services; the weight of this element is 16.67% (Table 6).

According to formula 2, the scope of the analysis of the k-th block and its i-th factor:

$$\mu_i^1 = \frac{0.5}{6} = 0.08, \quad (6)$$

$$\mu_i^2 = \frac{0.333}{6} = 0.055, \quad (7)$$

$$\mu_i^3 = \frac{0.1667}{7} = 0.023. \quad (8)$$

The next step is an analysis of the calculation results of each element of SUMS by taking its weight (Table 7).

These results are summed to have a general rating of the studied university, which is equal to:

$$R = 0.2 + 0.19 + 0.108 = 0.498. \quad (9)$$

Thus, the studied university obtains the grade C that is between intervals of 0-0.50 according to the university rating. This is a low result. According to the results in KazUIR&WL's smart university management system, smart learning technology infrastructure and smart teaching faculty elements are implemented at the same level; the element of smart students is less successful than the first two elements.

4. DISCUSSION

There is limited evidence on the assessment of the implementation level of smart university management system based on the example of a specific university, in particular, and the higher education system of Kazakhstan, as a whole. There are no studies evaluating the level of technology development and digital readiness of universities, except for scientific-research institutes (Alzhanova et al., 2020), which can also be separate divisions of universities and affect the quantity and quality of knowledge transferred. There are only several studies on the digitalization of the educational process (Saparkhojayev & Akkozieva, 2016; Akhmed-Zaki et al., 2019; Kozhabekova et al., 2020). In this regard, it is impossible to compare the results obtained with early studies in Kazakhstan.

Table 7. Assessment of the level of SLTI, SFS, and SS through weighted means

SLTI				SFS				SS			
Element 1	i^1	D_i^1	K_i^1	Element 2	m	D_i^2	K_i^2	Element 3	i^3	D_i^3	K_i^3
1	2	3	4	5	6	7	8	9	10	11	12
SLTI1	0.08	0.52	0.0416	SFS1	0.055	0.60	0.033	SS1	0.023	0.71	0.016
SLTI2	0.08	0.44	0.0352	SFS2	0.055	0.61	0.0335	SS2	0.023	0.89	0.020
SLTI3	0.08	0.37	0.0296	SFS3	0.055	0.53	0.029	SS3	0.023	0.76	0.017
SLTI4	0.08	0.43	0.0344	SFS4	0.055	0.61	0.0335	SS4	0.023	0.68	0.015
SLTI5	0.08	0.45	0.036	SFS5	0.055	0.54	0.0297	SS5	0.023	0.58	0.013
SLTI6	0.08	0.29	0.0232	SFS6	0.055	0.57	0.031	SS6	0.023	0.53	0.012
								SS7	0.023	0.66	0.015
Total results for element 1			0.2	Total results for element 2			0.19	Total results for element 3			0.108

http://dx.doi.org/10.21511/ppm.21(1).2023.43

However, even though there were some areas where the level of technology infrastructure did not provide enough possibility to improve students' practical skills, the findings of this study showed significant roles of tangible part of the university infrastructure to reach a beneficial and leading position on the education service market. It confirms the conclusions of Coccoli et al. (2014).

The findings specifically revealed the following features of the university development within the framework of the smart university concept:

- access to free Wi-Fi that supports the university (0.29),
- smart environment necessary for smart learning (0.37),
- classrooms with smart tools for smart learning (0.43),
- smart classes organized by the teaching staff at the university (0.53),
- access to major and minor programs that allow the students to deepen their knowledge and practical skills (0.53).

Those results are characterized as comparatively low because the total results of the university rating are low compared to the threshold values of evaluation. Therefore, this study suggests university management support students with free Wi-Fi, create smart education environment and smart classroom that can be an effective means of transferring knowledge and skills, improve the content of the courses (major and minor), provide quick share of information, and ensure feedback exchange between students and teachers. Furthermore, besides the availability of resources that help to organize smart learning process, the qualification of teaching staff is essential, as it should have the competence to conduct classes using smart technologies. Moreover, a potential teacher grows proportionally in the exponent according to the level of professional development. Thus, the higher the teacher's professionalism, the higher the quality of the education itself at the university.

The competitiveness of educational institutions has constantly been growing according to this factor, which in turn, leads to missed gaps in both the educational environment and the labor market (Chládková et al., 2021). According to the online survey, the study identified the problems in the successful implementation of SUMS in modern realities. The quick solution to these gaps, such as equipping smart classrooms, using innovative teaching technologies, increasing the teaching staff qualification, offerring free Wi-Fi for all participants of the learning process (teaching staff and students), allows the university to raise its level of competitiveness.

This study is the first to conduct an online survey to highlight the issues of assessing the degree of implementation and effective functioning of SUMS in modern realities. An essential part of any online survey is not only the survey itself (with questions and multiple response options) but also the means through which these questionnaires are distributed to students. Most students prefer social media platforms such as Facebook, WhatsApp, Telegram, and Instagram instead of email. Therefore, having quick feedback from students using these platforms also facilitates the university management to increase the competitiveness of the university.

Further investigation should be devoted to a broader estimation of the current conditions of the smart university management system from the teaching staff's viewpoints using qualitative research methods. Developing a ranking of smart universities based on SUMS implementation level among Kazakhstani universities would be interesting.

CONCLUSION

The study aimed to assess the implementation level of a smart university management system on the example of Kazakh Ablai khan International Relations and World Languages University (Almaty, Kazakhstan). Three elements of SUMS of KazUIR&WL were evaluated: smart learning technology infrastructure, smart faculty staff, and smart students. Based on the study, the following conclusions were obtained.

First, the smart university management system is an effective tool for assessing the implementation of smart university elements. The use of smart devices and information technologies is a priority for enhancing the effectiveness of learning and the competitiveness of educational institutions. Notably, in the learning process, a teacher, a student, and their focus on smart learning are observed.

Second, despite the ranking of student smart technology at the level of 50%, the majority of respondents are not satisfied with the smart environment at the university, in particular with digital technologies and Wi-Fi access (0.37 and 0.29). The experts evaluated the smart teaching staff element with 33.33%. However, only 53% of the students surveyed are satisfied with the use of smart classrooms by their teachers. As the end consumer of educational services is a student, the experts carefully evaluated the weight of smart students' elements – 16.67%. Interviewed students said they actively use smartphones (90%), and laptops (76%). However, only 58% of students noted that teachers use smart technologies to improve their knowledge and skills.

Third, the weighted assessment of the level of use of each element showed the following results: smart learning technology infrastructure – 0.2, smart faculty staff – 0.19, smart students – 0.108. These results show a low implementation level of smart university management system – C (0.498).

The results obtained during this study may be subjective. However, given the lack of a methodological and statistical basis for qualitative monitoring, analysis, and evaluation of the performance and development of the smart university management system, they can be taken into account to determine the state and priority areas for the development of the smart university concept. The university management should improve smart learning technology infrastructure (free Wi-Fi, smart education environment, and smart classrooms) and enhance the qualifications of teaching staff (their knowledge and skills, the content of the courses, and other educational aspects) to create smart faculty staff. These measures will contribute to increasing the degree of student satisfaction and the development of the smart students' element.

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