

Zarubina, Venera; Zarubin, Mikhail; Yessenkulova, Zhaukhar; Salimbayeva, Rassima; Satbaeva, Gulbarshyn

## Article

# Digital transformation of the promotion of educational services of Kazakhstani universities

Journal of Innovation and Entrepreneurship

## Provided in Cooperation with:

Springer Nature

*Suggested Citation:* Zarubina, Venera; Zarubin, Mikhail; Yessenkulova, Zhaukhar; Salimbayeva, Rassima; Satbaeva, Gulbarshyn (2024) : Digital transformation of the promotion of educational services of Kazakhstani universities, Journal of Innovation and Entrepreneurship, ISSN 2192-5372, Springer, Heidelberg, Vol. 13, Iss. 1, pp. 1-20, <https://doi.org/10.1186/s13731-023-00355-3>

This Version is available at:

<https://hdl.handle.net/10419/290337>

### Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

### Terms of use:

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*



<https://creativecommons.org/licenses/by/4.0/>

RESEARCH

Open Access



# Digital transformation of the promotion of educational services of Kazakhstani universities

Venera Zarubina<sup>1\*</sup> , Mikhail Zarubin<sup>1</sup> , Zhaukhar Yessenkulova<sup>2</sup> , Rassima Salimbayeva<sup>2</sup> and Gulbarshyn Satbaeva<sup>2</sup>

\*Correspondence:  
zarubina\_v@mail.ru

<sup>1</sup> Kostanay Engineering and Economic University Named After M. Dulatov, Chernyshevsky Street 59, Kostanay 111000, Republic of Kazakhstan

<sup>2</sup> Non-Profit Joint Stock Company "Narxoz University", Zhandosov Street 55, Almaty 050035, Republic of Kazakhstan

## Abstract

Digital channels have become the modern priority channels for promoting educational services. Integration into the international educational space, changes in the priority of communication channels, and digital transformation have led to the need to rethink existing approaches to the digital promotion of educational services of Kazakhstani universities. Particular interest in modernizing the promotion of educational services is caused by the fact that representatives of the new generation, Generation Z, are now becoming consumers of educational services. The basis of this study was the analysis of digital promotion channels as the main source of information and value, the needs of generation Z, who are now becoming the main consumers of the services of universities, including those in Kazakhstan. The purpose of the study is to determine the priorities for the digital promotion of educational services, to build a model for the digital promotion of university educational services, taking into account the needs of key consumers—generation Z, digital channels, and educational programs of the university. Hypothesis: priorities for digital promotion of educational services of universities should be differentiated depending on the popularity and technical parameters of the sites. The web resources similarweb.com, pagespeed.web.dev, wordstat.yandex.ru, sitechecker.pro were used as analysis tools. A correlation analysis of queries on university websites and the core values of generation Z was carried out. The closeness of the pairwise correlation between the total number of visits and website performance, search engine optimization, recommendations, and special features was determined. Based on the research, a model for promoting the university's educational services has been structured, highlighting key components: educational programs, digital technologies, and the values of generation Z.

**Keywords:** Promotion of educational services, Kazakhstan, Digital marketing, Generation Z, Promotion channels, Model for promoting educational services of the university

## Introduction

According to the Wittgenstein Center for Demography and Global Human Capital, there will be 2 billion more graduates from schools, colleges, universities and alternative higher education institutions in the world by 2050 than in 2020.

The main reason for the increase in the number of students will be the general increase in the world population, including due to an increase in the average life span. The increase in the working-age population and the global trend towards continuous education throughout the entire life cycle will greatly increase the influence of demographic factors on the existing and potential demand for educational services and the workload of the education system. The share of the online learning segment in the current situation will also naturally increase.

With increasing access to the Internet and new technologies, the way we think about education will change dramatically.

Economic factors are the main determinants of online education growth and partnerships. Growing online education offers opportunities to further the institutional mission of universities. The growth of online learning, especially through full online degrees, is seen as a potential new source of revenue (Morris et al. 2020).

Distance education already plays a critical role in providing access to education for many millions of people in developing countries. More than 7 million students are currently enrolled in open distance learning universities in Bangladesh, India, Iran, Pakistan, South Africa and Turkey alone.

But the vector of e-learning is still set by developed countries. The United States has the largest number of international students in the world. The USA and Europe are leaders in digital learning; 70% of online universities are located in these countries (Zahier, 2023). By 2025, the massive open online courses (MOOCs) market could be valued at \$25.33 billion. According to research (Emerson, 2022), the MOOC industry is currently valued at \$5.16 billion and is expected to grow at a rate of 32.09 percent per year.

According to forecasts (Zahier, 2023), by 2026 the leader should change and China will become the largest participant in the e-learning market. The projected growth is associated with Chinese policies aimed at accelerating the transition to new teaching methods based on Internet technologies.

But despite all these actions, surprisingly, education is lagging in the digital sphere: digital technologies in education now account for less than 4% of total spending, which, in our opinion, represents a serious problem.

In 2020, education spent \$227 billion on digital technology. Total spending in the global education and training market is projected to reach \$7.3 trillion (all products and services, including digital) by 2025 (HolonIQ, 2021). By 2025, the amount for digital technologies could rise to \$404 billion, but the share would still be barely 5% of total spending and considered by many to be quite conservative.

Although the long-term impact of COVID-19 on education models has not yet emerged, spending on digital infrastructure in education is still expected to increase over the next few years and spending on new digital models is still expected to increase in the long term (HolonIQ, 2021).

Universities around the world must increase their distance learning capabilities regardless of any reason, such as the COVID-19 pandemic or other emergency, and educators must improve their digital competencies (Karadag et al., 2021).

Research (Bond et al., 2018) found that students have access to a range of tools and are willing to use digital media for academic learning. However, this depends on whether teachers will implement digital media and the university will implement policies in this direction.

The challenge for higher education is significant. Now we need to prepare educational trajectories for the next generation, for whom “smart” technologies become not just a tool for communication and learning, but ordinary social practices.

The innovative path of socio-economic development of the country is becoming an urgent problem for Kazakhstan. It is necessary to ensure the modernization of the economy through the introduction of modern technologies and maximum use of the country's intellectual potential (Sadyrova et al., 2021).

16 Kazakh universities participated in the QS World University Rankings 2023, which includes about one and a half thousand universities from around the world. Of these, five universities made it into the top 500: Kazakh National University, al-Farabi, Eurasian National University named after L.N. Gumilyov, Satbayev University, South Kazakhstan University named after Auezov and Kazakh National Agrarian University.

Another 8 universities made it into the top 1000: Kazakh National Pedagogical University named after Abai, Almaty Technological University, Karaganda State Technical University, Kazakh National Medical University named after S.D. Asfendiyarov, International Kazakh-Turkish University named after Khoja Ahmed Yasawi, Karaganda University named after Buketov, Kazakh-British Technical University and NAC KIMEP University.

The dynamics of the number of higher educational institutions and the number of students in Kazakhstan (Bureau of National Statistics, 2021) are presented in Table 1.

The number of students in these Kazakhstani universities has increased significantly over the period under review. In the 2020/2021 academic year, compared to 2015/2016, it increased by 25.5%. The impact of COVID-19 has expanded the horizons of distance learning both in the world and in Kazakhstan. Distance education in Kazakhstan is now in its infancy (course programs, teaching methods, consultations and control, etc., are being developed). But already today, many universities offer Kazakhstanis to improve

**Table 1** Dynamics of the number of universities of the Republic of Kazakhstan

Indicators	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021
Number of higher education institutions, units	127	125	122	124	125	125
Including						
State property	50	47	47	45	41	33
Private property	77	78	75	79	84	92
Foreign property	—	—	—	—	—	—
Number of students in them, people	459 369	477 074	496 209	542 458	604 345	576 557

their qualifications or get a completely new specialty remotely. Changing the format of education allows you to expand the geography and provide educational services not only within the country, but also abroad. Entering the international market of educational services requires work to promote universities in the digital space.

### **Materials and methods**

To achieve this goal, based on a literature review, the authors analyzed the needs of generation Z, analyzed key information about the search queries of website visitors and the values of generation Z. The assessment of digital marketing in promoting university educational services was based on a comparative analysis of the websites of leading national universities of the Republic of Kazakhstan, as well as the leading world leader—US university.

The hypothesis testing was based on the use of an integral index approach to assessing the effectiveness of promoting educational services through the website. The use of an integral index approach allows web developers to assess the degree of effectiveness of their work in comparison with other educational institutions and develop promotional measures.

To achieve this goal, the authors analyzed university websites based on technical parameters, popularity of visits, and correlation dependence.

The theoretical part examines the relevance of digital transformation, methods of promoting educational services, modern views, and the values of generation Z, who are becoming consumers of educational services of higher educational institutions.

In the practical part, a matrix “Popularity—Technical promotion of the site” is proposed. The matrix segments and promotion priorities were characterized.

When writing the article, the authors used methods of analysis and synthesis, the method of system analysis, retrospective analysis of literature, web analytics, comparative analysis, correlation analysis, statistical data analysis, informal document analysis.

The assessment of digital marketing in promoting university educational services was based on a comparative analysis of the websites of the leading national universities of the Republic of Kazakhstan, as well as the world’s leading university—the US university. The resources used for analysis were similarweb.com, pagespeed.web.dev, wordstat.yandex.ru, sitechecker.pro. A comparative analysis of the channels directing to the website of national universities, the distribution of traffic to the websites of universities by country, and the main competitors of the websites was carried out. A correlation analysis of queries on university websites and the core values of generation Z was carried out. The closeness of the pairwise correlation between the total number of visits and website performance, search engine optimization, recommendations, and special features was determined. A model for promoting the university’s educational services is structured, highlighting key components—educational programs, digital technologies, and the values of generation Z.

### **Literature review**

The digital transformation of education leads to the need to combine research and practical work in the field of educational innovation with solutions in the field of informatization of education (Liu, 2020; Moreno-Guerrero et al., 2020). The digital transformation

of education creates conditions for the development and dissemination of new models of work of educational organizations, which are based on the synthesis of: new digital tools, information sources and services; organizational and infrastructural conditions for their implementation.

Research (Rodríguez-Abitia et al., 2020) notes that the digital transformation of higher education must take into account three main axes: technological, pedagogical and organizational. Each of them is associated with a view of how technologies are conceived: technological with information and communication technologies, pedagogical with learning, digital competencies, educational with innovation and knowledge technologies, and organizational with technologies of organizational and participatory management.

Improper development of technological infrastructure, limitations in the number of devices or Internet access, and financial barriers can disrupt the harmony of online learning (Shahriar et al., 2021).

Investment in quality IT infrastructure in education is the foundation of digital transformation for stakeholders (Kaputa et al., 2022).

Digital marketing is now an important tool for the internationalization of education. The education industry has introduced tools to effectively adapt business to the needs of students (Fierro et al., 2017).

Researchers (Arnold & Sangrà, 2018) caution that the adoption of digital learning is not simply a move to online formats, but requires strategy and leadership specifically focused on the adoption of technology-enabled learning and the digital transformation of higher education institutions.

According to Rampelt and et al., (2019), digital technologies affect all activities of universities. They permeate all processes, places, formats and purposes of teaching, learning, research and work in higher education.

Thanks to modern educational technologies, US educational institutions provide learning opportunities through the World Wide Web. If in 1998 48% of educational institutions offered online training (Rapatsevich, 2013), then in 2000 it was already 70%, and today many universities in the USA provide only online training.

Today, promoting educational services via the Internet is the most effective way to convey information to potential consumers (Soboleva, 2014).

Research (Nurmalasari & Masitoh, 2020) notes that the more intense the promotion, the more effective and efficient the marketing of educational institutions will be.

In Kazakhstan, there is significant potential for the development of Internet marketing associated with the growth of users of mobile applications and networks, the Internet (Nasakaeva, 2021). The website is a tool for promoting educational services.

The advantages of a website as a tool for advertising universities are obvious: relative cheapness, a huge target audience, information mobility, and general accessibility (Zarubina & Zarubin, 2014).

Particular interest in the promotion of educational services is caused by the fact that now mainly representatives of generation Z are becoming consumers of educational services.

Higher education can either adopt philosophies and practices that teach to mobilize, empower and prepare Generation Z to solve the problems of our world, or miss

the opportunity to significantly influence the great minds of our next great generation (Seemiller & Grace, 2017).

According to research results (Crowe, 2017), Generation Z made up more than 25% of the total information audience for US history. The term “Generation Z” was first coined in 2012 by USA Today magazine, and became widespread after the publication of the first large-scale study of this generation, carried out by an advertising project by Sparks and Honey in 2014: “Meet Generation Z: Forget Everything.” “What have you learned about millennials” (Schawbel, 2014). Generation Z has become the first generation of true “digital natives” (Maletín, 2017), born and raised in the world of computers, cell phones and smartphones. Widespread use of the Internet among representatives of this generation has been observed from a very early age (Amato, 2017), searching for information on Google, in additional social networks, chats, forums, and communities. It is new technologies that take into account all the consequences, generation Z.

Gen Zers are more open to diversity, more individualistic, and more technology-oriented than other generations (Shaun Pichler et al., 2021).

The use of digital media coupled with personal interaction is considered an effective method of marketing to Generation Z students. Students who fall into Generation Z are identified as technologically savvy and well-adapted to the variety of digital platforms available for sharing, collecting and exchanging information. They expect to receive information through digital media (Spears et al., 2015).

The share of Internet users among generation Z is 85–90%. They spend more than 3 h online. As a result, 24% of teenagers go online almost constantly. Advertising and information for young people needs to shift to the Internet (Milos, 2017). The increased use of mobile technology means that social media use has become part of the daily lives of most Generation Z teenagers.

The study (Nauman, 2021) analyzed the marketing strategies used for generation Z in comparison with generations X and Y. The results of the study show that the 4P marketing mix remains the most important component in attracting this audience. A focus on using data to develop marketing strategies along with a collaborative culture is effective. Institutions can apply the learnings by implementing data sharing across campus, cultivating a culture of collaboration, using data to develop specific target markets, creating a clear brand, and investing in digital marketing strategies such as websites and social media.

In the context of the fourth industrial revolution, the strategic model for promoting the benefits of the 7Ps of educational institutions should be carried out through social networks (Maisah et al., 2020; Rukaeni et al., 2022).

Over the past decade, the audience of social networks has grown faster than the audience of the Internet, by an average of 12% per year. According to the results of the study, 96% of experts noted that the priority tactics at the moment for organizations is to engage and retain consumers of services using, first of all, the email channel and social networks (Indiani & Fahik, 2020).

Integration into the international educational space, changes in the priority of communication channels, digital transformation lead to the need to rethink the digital promotion of educational services of Kazakhstan universities.



## Main part

In modern conditions of constant competition, Kazakh universities use various channels to promote educational services. These are both offline and online marketing promotion channels. The Internet is the main source of information for young people. Internet promotion of educational services is becoming a leading area of marketing at any level and consumer segment. The transformation of the use of information transmission channels requires a change in approaches to the promotion of educational services. In order to develop in unusual new conditions, educational organizations must use all possible promotion tools. Traditional and Internet marketing technologies are aimed at positioning educational institutions, distinguishing them from competitors and attracting students. Digitalization efforts are creating a new society, increasing efficiency and speed of work through automation and other new technologies (Zarubin et al., 2021; Zarubina et al., 2021). We have analyzed the promotion of the websites of the leading universities of the Republic of Kazakhstan, included in the TOP 500 of the QS World University Rankings 2023. The top of the ranking of the world's leading universities is the Massachusetts Institute of Technology, whose website was taken for comparative analysis with Kazakhstani websites of universities. Analysis of competitor sites allows you to improve the existing tactics used to promote the resource. An analysis of the number of visits to university websites is presented in Table 2.

An analysis of the number of visits indicates a significant spread and interest in the websites of Kazakhstani universities. In addition, in some cases, the number of visits is less than 5000 hits per month, which does not allow further assessment of the site using the resource.

The site speed was also assessed when using login from a computer and mobile devices (Tables 3, 4).

Site speed evaluation parameters include performance, accessibility, recommendations, search engine optimization. Reducing the time until the first byte is received from the server allows you to maintain interest in the site. The server response time for the main document should be fast, because all other requests depend on this indicator.

**Table 2** Analysis of the number of visits. Source: <https://www.similarweb.com/ru/website>

Indicators	<a href="http://www.kaznu.kz">www.kaznu.kz</a>	<a href="http://www.enu.kz">www.enu.kz</a>	<a href="http://www.satbayev.university.ru">www.satbayev.university.ru</a>	<a href="http://www.auezov.edu.kz/rus">www.auezov.edu.kz/rus</a>	<a href="http://www.kaznaru.edu.kz">www.kaznaru.edu.kz</a>	<a href="http://www.mit.edu">www.mit.edu</a>
Total number of visits in the last month	504.3 K	746.6 K	149.5 K	Less than 5 K	59.3 K	45.6 M
Bounce rate	47.18	27.25	36.15	–	78.18	39.59
Average number of pages per visit	7.45	5.89	3.33	–	2.19	8.53



**Table 3** Evaluation of site speed, login from a computer. Source: <https://pagespeed.web.dev>

Indicators	Website					
	<a href="http://www.kaznu.kz">www.kaznu.kz</a>	<a href="http://www.enu.kz">www.enu.kz</a>	<a href="http://www.satbayev.university.ru">www.satbayev.university.ru</a>	<a href="http://www.auezov.edu.kz/rus">www.auezov.edu.kz/rus</a>	<a href="http://www.kaznaru.edu.kz">www.kaznaru.edu.kz</a>	<a href="http://www.mit.edu">www.mit.edu</a>
Performance	68	68	56	47	68	75
Special abilities	78	74	80	80	78	96
Recommendations	58	83	83	83	58	100
Search engine optimization	82	82	91	73	82	91

**Table 4** Evaluation of site speed, login from mobile devices. Source: <https://pagespeed.web.dev>

Indicators	Website					
	<a href="http://www.kaznu.kz">www.kaznu.kz</a>	<a href="http://www.enu.kz">www.enu.kz</a>	<a href="http://www.satbayev.university.ru">www.satbayev.university.ru</a>	<a href="http://www.auezov.edu.kz/rus">www.auezov.edu.kz/rus</a>	<a href="http://www.kaznaru.edu.kz">www.kaznaru.edu.kz</a>	<a href="http://www.mit.edu">www.mit.edu</a>
Performance	38	57	21	24	38	59
Special abilities	83	74	80	80	83	97
Recommendations	58	75	83	83	58	100
Search engine optimization	83	83	90	73	83	92

The use of an integral index approach to assessing the effectiveness of promoting educational services through a website allows web developers to assess the degree of effectiveness of their work in comparison with other educational institutions.

To assess the effectiveness of the technical parameters of the site, we suggest using the technical assessment index:

$$I_T = I_1 * I_2, \quad (1)$$

where  $I_1$  is the site performance index, input from a computer; and  $I_2$ —site performance index, login from mobile devices.

The performance index is proposed to be calculated from an assessment of the site's speed according to the resource <https://pagespeed.web.dev> (Parameters: performance, accessibility, recommendations, search engine optimization. The range of parameters can vary from 0 to 100%.) depending on:

$$I_1 = P_1 * SA_1 * R_1 * SO_1,$$

$$I_2 = P_2 * SA_2 * R_2 * SO_2, \quad (2)$$

where  $P_1/P_2$ —site performance level, input from computer/mobile devices;  $SA_1/SA_2$ —level of use of accessibility features, input from computer/mobile devices; and  $R_1/R_2$ —level of use of recommendations, input from computer/mobile devices; and  $SO_1/SO_2$ —level of search engine optimization use, input from computer/mobile devices.

The calculation of the technical assessment index of the selected sites is presented in Table 6.

In the context of integration into the global educational space, assessing the popularity of the site will make it possible to assess the current situation of its popularity and develop measures to promote it.

The popularity index of a website for a particular university can be considered as the proportion of website visitors over a certain period of time in comparison with the number of visitors to the leading university website.

Such an index can be calculated using data from the resource [www.similarweb.com](http://www.similarweb.com) both globally and separately within a country:

$$I_3 = V_i/V_1,$$

(3)

where  $I_3$  is the site popularity index;  $V_i$ —the number of visits to the university website over a certain period of time; and  $V_1$ —the number of visits to the website of the leading university over a certain period of time.

The calculation of the popularity index of the selected sites is presented in Table 6.

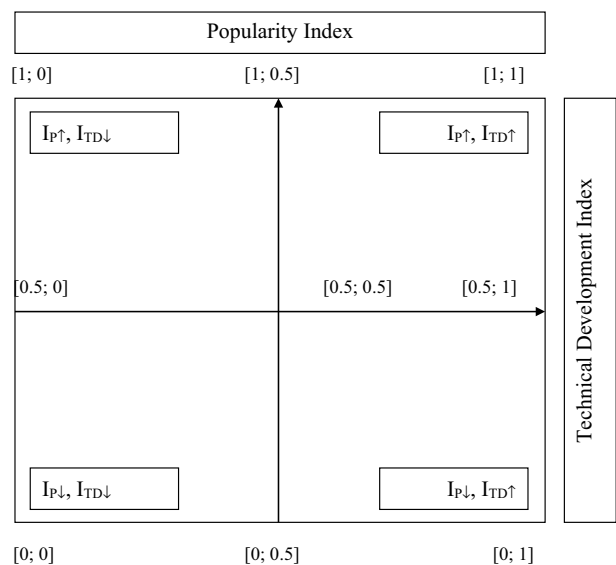
Based on the technical assessment index data, as well as the site popularity index, we propose constructing a matrix for selecting promotion priorities. The matrix is a square, with an index varying from zero to one. The matrix square is divided into four segments with an interval of 0.5. The maximum value at the point (1;1), minimum (0;0). As a result, four segments were obtained (Fig. 1).

$$I = I_T * I_3$$

(4)

We propose to determine the integral website promotion index, which takes into account both technical assessment and popularity assessment, using the formula:

A selection of recommended actions to improve university websites as digital promotion tools for various sectors of the matrix is presented in Table 5 (see Tables 6, Table 7).



**Fig. 1** Matrix “Popularity—technical promotion of the site”

**Table 5** Characteristics of matrix segments and promotion priorities

Segment popularity(p)/ technical performance(tp)	Recommended actions/promotion priorities
$I_{PT}, I_{TD} \uparrow$	<i>High popularity/high technical performance</i> (leaders in the educational services market) The tasks of universities in this segment are to strengthen their existing positions: search for innovative technical solutions, update information, search for new “tricks”
$I_{PT}, I_{TD} \downarrow$	<i>High popularity/low technical productivity</i> The tasks of universities in this segment are to improve the technical characteristics of the site in terms of performance, accessibility, search engine optimization, optimization of versions for logging in from a computer and mobile devices
$I_{PW}, I_{TD} \uparrow$	<i>Low popularity/high technical performance</i> The tasks of universities with low popularity of the university website are: <ul style="list-style-type: none"> <li>- Analysis and modernization of site content, design, usability, interactivity;</li> <li>- Use of media and contextual advertising for the target audience;</li> <li>- Conducting a comparative analysis of existing educational programs with the programs of leading universities in order to improve them;</li> <li>- Ensuring an increase in the conversion level</li> </ul>
$I_{PW}, I_{TD} \downarrow$	<i>Low popularity/low technical performance</i> The tasks of universities in this segment are comprehensive work to optimize the technical parameters of the site, as well as the development of measures to improve the promotion of university educational programs for the target audience. (analysis of site content, design, usability, interactivity, advertising)

We have carried out a statistical evaluation of the pair dependence of the number of visits to university sites and site speed in terms of performance, search engine optimization, accessibility, and recommendations (Table 8).

Pair correlation analysis shows an average relationship between the total number of visits in the last month and site performance, as well as the total number of visits and search engine optimization, the coefficient of determination is 0.66 and 0.61, respectively. Users do not like to wait for a page to load. According to site page performance analysis data (Arshinov, 2020), 47% of e-commerce site visitors expect a page to load within 2 s. If this does not happen, there is a high probability that people will leave the site. Google uses this indicator to rank sites: the faster they load, the higher in the search results (Arshinov, 2020). Site performance components include two main areas: back-end and front-end performance. Site performance varies from 56 to 75%, which corresponds to the average performance value. Universities belonging to groups with low connection speed and below average speed may experience serious difficulties in providing mass access of students to the resources hosted in the university, as well as to external resources from within the university.

Search engine optimization improvements should focus on using modern image formats, using appropriate image sizes, and eliminating display-blocking resources. There is a high relationship between the total number of visits in the last month and accessibility, as well as the total number of visits and recommendations. Accessibility features do not fully utilize background/foreground color contrast, image tags do not always contain alt text, and there are comments on how navigation is organized. General recommendations are related to improving the reliability and security of sites, debugging on existing resources.

**Table 6** Calculation of the integral website promotion index

University	Domain site name	Computer login evaluation options			Mobile login evaluation options			Search engine optimization			Technical assessment index	Site popularity index	Integral index promotion
		Performance	Special abilities	Recommendations	Search engine optimization	Efficiency Index	Performance	Special abilities	Recommendations	Search engine optimization	Efficiency Index		
Kazakh National University named after al-Farabi	<a href="http://www.kaznu.kz">www.kaznu.kz</a>	0.68	0.78	0.58	0.82	0.715	0.38	0.83	0.58	0.83	0.655	0.011059	0.005179
Eurasian National Uni- versity named after L.N. Gumilyov	<a href="http://www.enu.kz">www.enu.kz</a>	0.68	0.74	0.82	0.83	0.768	0.57	0.74	0.75	0.83	0.723	0.016373	0.009079
Satbayev University	<a href="http://www.satbaev.unive.rsity.ru">www.satbaev.unive.rsity.ru</a>	0.56	0.8	0.83	0.91	0.775	0.21	0.8	0.83	0.9	0.685	0.5308750.003279	0.001740
South Kazakh- stan University named after Auezov	<a href="http://www.auezov.edu.kz">www.auezov.edu.kz</a>	0.47	0.8	0.83	0.73	0.708	0.24	0.8	0.83	0.73	0.650	0.459875	0.000050
Kazakh National Agrarian University	<a href="http://www.kazna.ru.edu.kz">www.kazna.ru.edu.kz</a>	0.68	0.78	0.58	0.82	0.715	0.38	0.83	0.58	0.83	0.655	0.468325	0.000609
Massachusetts Institute of Technology	<a href="http://www.mit.edu">www.mit.edu</a>	0.75	0.96	1	0.91	0.905	0.59	0.97	1	0.92	0.870	0.78735	1 0.787350

**Table 7** Priorities for promoting leading Kazakh university websites according to the parameters “popularity—technical performance”

University	Technical assessment index for entering the site	Website popularity index in the world	Range	Characteristics of tasks
Kazakh National University named after. al-Farabi	0.4683	0.0111	( $0 < I_t < 0.5$ ; $0 < I_p < 0.5$ )	<p><i>Technical parameters are low</i> Work is required on the technical parameters of the site—performance, special features, search engine optimization when entering both from a computer and from mobile devices</p> <p><i>Popularity parameters are low</i> It is required to identify activities to promote the university's educational programs to the target audience; conducting content analysis of website content, design, usability, interactivity, advertising</p>
Eurasian National University named after L.N. Gumilyov	0.5545	0.0164	( $0.5 < I_t < 1$ ; $0 < I_p < 0.5$ )	<p><i>Technical parameters are above average</i> The technical component is satisfactory; it is necessary to ensure an increase in the performance of the site when entering from a computer and mobile devices</p> <p><i>Popularity parameters are low</i> Concentration of efforts on marketing promotion for the target audience is required</p>
Satbayev University	0.5309	0.0033	( $0.5 < I_t < 1$ ; $0 < I_p < 0.5$ )	<p><i>Technical parameters are above average</i> The technical component is satisfactory. It is required to ensure an increase in site performance when logging in from a computer and mobile devices</p> <p><i>Popularity parameters are low</i> Requires concentration of efforts on marketing promotion</p>

**Table 7** (continued)

University	Technical assessment index for entering the site	Website popularity index in the world	Range	Characteristics of tasks
South Kazakhstan University named after Auezov	0.4599	0.0001	$(0 < I_t < 0.5;$ $0 < I_p < 0.5)$	<i>Technical parameters are low</i> Unsatisfactory site performance when logging in from mobile devices and computers <i>Popularity parameters are low</i> Requires concentration of efforts on marketing promotion
Kazakh National Agrarian University	0.4683	0.0013	$(0 < I_t < 0.5;$ $0 < I_p < 0.5)$	<i>Technical parameters are low</i> Unsatisfactory site performance when logging in from mobile devices. It is necessary to carry out work to improve the reliability and security of sites, and perform debugging on existing resources <i>Popularity parameters are low</i> Concentration of efforts is required on the marketing promotion of educational services for end consumers
Massachusetts Institute of Technology	0.7874	1.0000	$(0.5 > I_t < 1; I_p = 1)$	<i>High technical parameters</i> Urgent investments in technical re-equipment of the site are not required. It is possible to improve the version of the site for mobile devices <i>High popularity</i> No urgent investment in promotion is required. It is possible to search for new "chips"

Targeting results by regions and countries are presented in Table 9.

Analysis of targeting by region and country shows requests to the websites of Kazakhstani universities within the territory of Kazakhstan (on average by 83%), while the request to the website of the Massachusetts Institute of Technology is more than 60% formed by foreign requests. This confirms the high interest in the educational programs of the Massachusetts Institute of Technology, not only in the United States, but throughout the world. Kazakhstan borders on Russia, China, Kyrgyzstan, Uzbekistan,

**Table 8** Calculation of correlation coefficients

Website	Total number of visits in the last month	Productivity, %	Search engine optimization of the site, %	Special abilities, %	Recommendations, %
<a href="http://www.kaznu.kz">www.kaznu.kz</a>	504,300	68	82	78	58
<a href="http://www.enu.kz">www.enu.kz</a>	746,600	68	82	74	83
<a href="http://www.satbayev.university.ru">www.satbayev.university.ru</a>	149,500	56	91	80	83
<a href="http://www.kaznar.ru.edu.kz">www.kaznar.ru.edu.kz</a>	59,300	68	82	78	58
<a href="http://www.mit.edu">www.mit.edu</a>	45,600,000	75	91	96	100
Pair correlation coefficient	–	0.6569	0.6075	0.9641	0.7287

**Table 9** Targeting by regions and countries

Indicators	<a href="http://www.kaznu.kz">www.kaznu.kz</a>	<a href="http://www.enu.kz">www.enu.kz</a>	<a href="http://www.satbayev.university.ru">www.satbayev.university.ru</a>	<a href="http://www.kaznar.ru.edu.kz">www.kaznar.ru.edu.kz</a>	<a href="http://www.mit.edu">www.mit.edu</a>
Kazakhstan	78.36	95.86	82.15	77.65	–
Russian Federation	10.66	1.69	6.01	3.38	–
Burkina Faso	1.48	–	–	–	–
Uzbekistan	1.16	–	–	–	–
Netherlands	1.14	–	–	–	–
Turkey	–	0.52	–	–	–
Japan	–	0.28	–	–	–
Belarus	–	–	2.04	5.34	–
Ukraine	–	–	1.55	–	–
Germany	–	–	1.13	–	–
Great Britain	–	–	–	1.29	3.17
Azerbaijan	–	–	–	12.34	–
USA	–	–	–	–	40.35
India	–	–	–	–	3.36
Canada	–	–	–	–	3.09
Philippines	–	–	–	–	2.51
Other	7.21	1.32	7.11	–	47.53

**Table 10** Audience demographics. Source: <https://www.similarweb.com/ru/website>

Indicators	<a href="http://www.kaznu.kz">www.kaznu.kz</a>	<a href="http://www.enu.kz">www.enu.kz</a>	<a href="http://www.satbayev.university.ru">www.satbayev.university.ru</a>	<a href="http://www.kaznar.ru.edu.kz">www.kaznar.ru.edu.kz</a>	<a href="http://www.mit.edu">www.mit.edu</a>
18–24	24.14	25.58	24.36	24.87	28.73
25–34	34.81	34.42	35.16	35.06	32.17
35–44	16.22	15.63	16.74	16.42	17.71
45–54	11.98	12.12	11.33	11.37	10.68
55–64	9.46	9.21	8.98	9.02	6.57
65 and more	3.39	3.04	3.43	3.25	4.15

Turkmenistan. At the same time, interest in the websites of Kazakh universities is observed from the Russian Federation, to individual universities from Uzbekistan.



Education at the universities of Kazakhstan is conducted in Kazakh, Russian, English. Promotion of Kazakhstani websites to the market of educational services of neighboring countries will make it possible to popularize Kazakhstani higher education.

Audience demographic monitoring is presented in Table 10.

Monitoring the demographic audience allows us to draw conclusions about the parity in the structure of the target audience of Kazakhstani universities, while it should be noted that there is a larger proportion of visitors to the MIT website in the age category of 18–24 years.

In the near future, generation Z will begin to receive education, having grown up in an environment of accessible digital technologies, intensive but superficial communication in social networks, and the widespread use of Internet technologies that allow expanding the boundaries of the world. Psychologists identify the following characteristic features of generation Z (Anfimova, 2018): high speed of obtaining information, the ability to quickly analyze large volumes of it, form new original solutions, and cope with several tasks simultaneously without loss of quality. The main motivation in learning and performing any tasks of generation Z is an interest in the subject and understanding the goals of the work performed. According to Microsoft research, teenagers spend only 8 s learning new information, as the speed of the information flow in which they live is very high. The digital transformation of the industry leads to the formation of a model of customer–consumer relationships through technologies aimed at customer needs. The following are called as some characteristics of generation Z (Mohr, 2017; Stillman & Stillman, 2018). They are tech-savvy and are in constant contact with people 24/7 using social networks and instant messengers. They want technology that is easy to use and that will solve their problems, help coordinate their activities, or provide them with the right people or information. They search Google and YouTube for answers, but they don't always have the critical thinking skills to evaluate sources. Instead of reading an article, they want to watch a video (YouTube) that sums it up. High degree of personalization. Generation Z is working hard to find and create their own image (Bogacheva & Sivak, 2019), they are looking for personalization in all spheres of life. High degree of pragmatism. “Do it yourself” (DIY—do-it-yourself). Generation Z is do-it-yourself.

We also studied key information about the search queries of visitors using the analytical tool [www.similarweb.com](http://www.similarweb.com). Audience interests reveal key information about the search queries of kaznu.kz visitors. The audience of kaznu.kz is interested in “Science and education > Education and google”. The enu.kz audience is interested in “Computers, electronics and technologies > Search engines and google”. The audience of satbayev.university is interested in “Computers, electronics and technologies > Programming and software for developers and google”. The audience of kaznaru.edu.kz is interested in «Arts and entertainment > Films and streaming and internet video». The mit.edu audience is interested in “Science and education > Universities and colleges and university”.

Researchers (Shamis & Nikonov, 2020) identified the following generation Z values: priority of science, investing in art and creativity, taking care of health all your life, safety, home and comfort in it, family is the basis of everything, culture of food and taste, variety in everything, a favorite thing.

Analysis of key information about the search queries of site visitors and the values of generation Z shows a correlation between queries and values. The priority is science, art

**Table 11** Overview of marketing channels

Promotion channel	<a href="http://www.kaznu.kz">www.kaznu.kz</a>	<a href="http://www.enu.kz">www.enu.kz</a>	<a href="http://www.satbayev.university.ru">www.satbayev.university.ru</a>	<a href="http://www.kazna.ru.edu.kz">www.kazna.ru.edu.kz</a>	<a href="http://www.mit.edu">www.mit.edu</a>
Straight	39.4	67.62	31.73	15.24	50.11
Referral	2.25	1.06	2.14	0.01	3.43
Search	56.05	25.3	52.1	80.1	41.91
Social media	1.76	3.63	12.5	4.66	3.51
Email	0.54	2.39	1.52	0.01	0.99
Media	0.01	0.01	0.01	0.01	0.06

**Table 12** Popularity of queries. Source: <https://wordstat.yandex.ru>

Query by words	Impressions per month		Regional popularity	
	Total	Including Kazakhstan	Region	%
Kazakh National University	3157	1845	Eurasia	100
Eurasian National University	1339	639	Eurasia	100
Satbayev University	1275	1195	Eurasia	100
South Kazakhstan University	539	280	Eurasia	100
Kazakh National Agrarian University	377	252	Eurasia	100
Massachusetts Institute of Technology	2458	104	Eurasia	100

and creativity, a favorite thing. The communicative behavior of generation Z also has a number of features. They pay attention to feedback and demand connection from others.

Analysis of marketing channels for obtaining information is presented in Table 11.

The use of the direct marketing channel of the Massachusetts Institute of Technology indicates the high popularity of the educational institution in the global educational services market. Direct marketing for websites of Kazakh universities is used within the regional market to a lesser extent. Significant differences are observed in the use of search marketing, which is engaged in the redistribution of traffic on the Internet from places that are less relevant to a query to places that are more relevant to them. Search marketing methods include all methods that solve this problem, ranging from direct attraction of targeted traffic with links from places less relevant to the site, ending with work within the site that increases the relevance of the site to its target audience (thereby increasing the visibility of the site in search engines due to re-ranking search results in favor of this site for key queries).

Analysis of the features of all requests from users of Kazakhstani sites using the site-checker.pro tool allows us to draw conclusions about the insufficient indexing of sites, the relevance of content, and duplication of content.

Audience interests reveal key information about visitors' search queries. We have studied the statistics of requests for the name of universities in the search engine wordstat.yandex.ru in the Eurasian space. Statistics in Wordstat are displayed by default for all regions where Yandex search is used (Table 12).

Analysis of requests indicates a high interest in the Kazakh National University both in Kazakhstan and in Eurasia. On the territory of the Eurasian space, high interest remains in the Massachusetts Institute of Technology. Interest in the leading technical

university Satbayev University is formed by Kazakhstani requests. The lack of popularity of requests can be noted for the South Kazakhstan University, the Kazakh National Agrarian University.

## Discussion

The high position of national universities in the ranking enhances the image of the country as a whole and attracts foreign students. To do this, universities should become more transparent, as well as introduce world-accepted standards for scientific research and training. The modern promotion of educational services focuses on digital technologies, on the one hand, and the values and needs of generation Z, who become consumers of university services, including those in Kazakhstan. Generation Z is very demanding on the quality of the services offered, which forces them to constantly monitor and improve educational programs. The analysis carried out allows us to draw conclusions about the need to popularize the websites of educational institutions, paying attention to usability. Being connected is a must for Generation Z. For Generation Z, communication is convenient through image, visual language. In the past few years, the current trend in the IT industry has been the creation of chatbots.

Artificial intelligence, together with natural language processing, can improve the productivity of customer interactions by taking on low-value tasks and multiplying customer-customization opportunities for frontline workers. Chatbots can handle a huge number of simple requests, answering questions instantly.

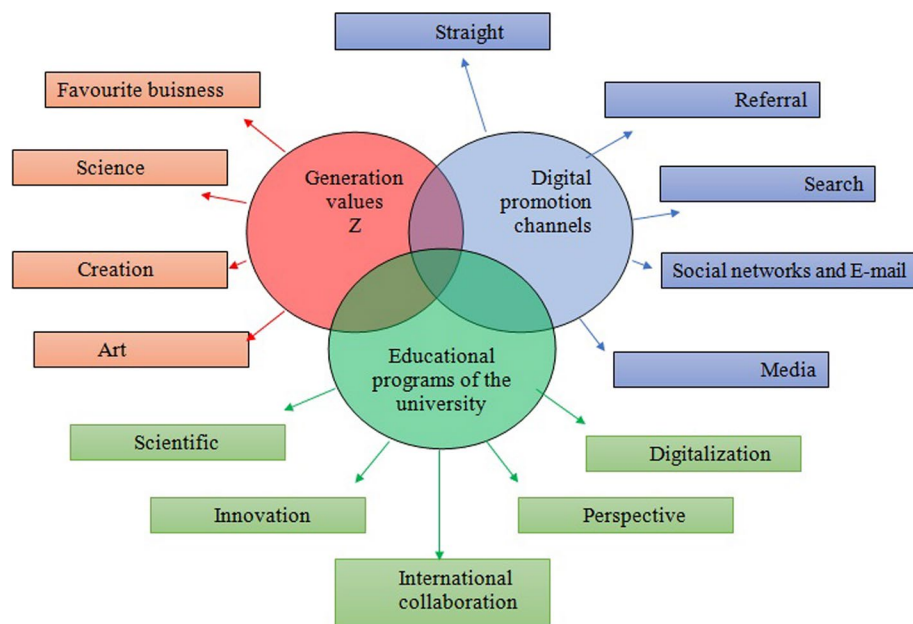
The content of sites must meet the requirements of relevance, scientific character. The values of generation Z are science, art, creativity, a favorite thing. The content of educational programs should correspond to the values of the generation of young people.

Analysis of targeting by regions and countries demonstrates requests to the websites of Kazakhstani universities within the territory of Kazakhstan. Kazakhstan borders on Russia, China, Kyrgyzstan, Uzbekistan, Turkmenistan. Promotion to the market of educational services requires work on the innovative transformation of the promotion of educational services, the active involvement of the teaching staff in digital transformation, reducing the polarization of the digital divide between generation Z—consumers of educational services and the teaching staff.

Modern promotion of educational services should be carried out taking into account the approaches of F. Kotler set out in Marketing 5.0, the values of generation Z (Evgeny Shamis, Evgeny Nikonov, Amat Sasha; Irina Milos; Dan Schaubel), digital transformation supported by legislation at the level of European states (program “Digital Europe”), the countries of the Eurasian community (“Digital Economy of the Russian Federation”, “Digital Uzbekistan – 2030”, “Digital Kyrgyzstan 2019–2023”), including in Kazakhstan (program “Digital Kazakhstan”).

The promotion model can be represented as follows (Fig. 2).

University educational programs must meet the following requirements: innovativeness, scientific character, prospects, international collaboration, digitalization, academic and scientific reputation, dissemination of knowledge and innovation. The digital transformation of the university focuses on creating a “learning university”;



**Fig. 2** Model of promoting the educational services of the university

when managers and employees perceive changes as the daily, ongoing work of the organization. An ecosystem is being formed at the university that identifies changing market trends and responds to them both at the level of pilot decisions and on a university-wide scale.

## Conclusions

The authors of the article studied the digital transformation of the promotion of educational services of Kazakhstani universities. The consideration of digital channels as the main ones requires an increase in the efficiency and effectiveness of their use. This becomes especially relevant, since generation Z becomes consumers of services. As a result of the study, a direct correlation was revealed between requests for university websites and the values of generation Z. Conclusions were drawn about the need to update educational sites, usability, and the use of relevant content that meets the requirements of scientific character. The proposed model for promoting the educational services of the university, based on the values of generation Z, educational programs of universities, digital technologies will increase the competitiveness of Kazakhstani universities in the international market of educational services.

## Abbreviations

USA	United States of America
MOOC	Massive Open Online Courses
QS	Quacquarelli Symonds
NJSC	National joint-stock company

## Acknowledgements

Not applicable.

## Author contributions

VZ, MZ: research concept development, data interpretation; ZY: material analysis, work preparation; RS, GS: collection and analysis of material, preparation of work. All authors read and approved the final version of the manuscript.

### Funding

The study on the topic “Digital transformation of the promotion of educational services of Kazakhstani universities” was carried out on an initiative scientific topic without grant or sponsorship funding.

### Availability of data and materials

For the preparation of the article, data from the resources similarweb.com, pagespeed.web.dev, wordstat.yandex.ru, sitechecker.pro were used. Statistical data of the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan were also used. The assessment of digital marketing in promoting the educational services of the university was based on a comparative analysis of the websites of the leading national universities of the Republic of Kazakhstan, as well as the leading world leader—the US University. In preparing the article, domestic and foreign literature sources were used.

### Declarations

#### Competing interests

The authors declare no competing interests.

Received: 15 February 2023 Accepted: 11 December 2023

Published online: 05 January 2024

### References

- Amato, S. (2017). What you need to know about generation Z. About the worldview, behavior and hobbies of postmillennials. *Buro247*. Retrieved January 25, 2023 from <https://www.buro247.ru/lifestyle/oebshcstvo/24-jul-2017-all-about-generation-z.html>
- Anfimova, E. (2018). Generation Z: problems, opportunities, prospects in the labor market. *Innovative Economy: Prospects for Development and Improvement*, 7(33), 256–261.
- Arnold, D., & Sangrà, A. (2018). Dawn or dusk of the 5th age of research in educational technology? A literature review on (e-)leadership for technology-enhanced learning in higher education (2013–2017). *International Journal of Educational Technology in Higher Education*, 15, 24. <https://doi.org/10.1186/s41239-018-0104-3>
- Arshinov, A. (2020). Page performance: what is it, why is it important and how to improve it? Retrieved January 28, 2023 from <https://weblina.blog/proizvoditelnost-stranic/>
- Bogacheva, N., & Sivak E. (2019). Myths about Generation Z. M.: NRU HSE, 64 p. Retrieved January 25, 2023 from [https://ioe.hse.ru/data/2019/05/25/1494557373/SAO%20\(1\)22%20electronic.pdf?fbclid=IwAR0dfR1os\\_SdUaa73E6rdAFcwWUP\\_95xLmMnIOZ7IR9HI-U2ZFpIWxb0vM](https://ioe.hse.ru/data/2019/05/25/1494557373/SAO%20(1)22%20electronic.pdf?fbclid=IwAR0dfR1os_SdUaa73E6rdAFcwWUP_95xLmMnIOZ7IR9HI-U2ZFpIWxb0vM)
- Bond, M., Marín, V. I., Dolch, C., et al. (2018). Digital transformation in German higher education: Student and teacher perceptions and usage of digital media. *International Journal of Educational Technology in Higher Education*, 15, 48. <https://doi.org/10.1186/s41239-018-0130-1>
- Bureau for National Statistics. (2021). Education statistics. Retrieved December 22, 2022 from <https://stat.gov.kz/official/industry/23/statistic/8>
- Crowe J. (2017). Meet Generation Z. The gospel coalition. Retrieved January 25, 2023 from <https://www.thegospelcoalition.org/reviews/meet-generation-z/>
- Emerson, A. (2022). Latest online learning statistics 2023: Facts and Figures Needed. Retrieved January 10, 2023 from <https://www.bloggersideas.com/en/online-learning-statistics>
- HoloniQ. (2021). Education Technology in 10 Charts. Retrieved January 15, 2023 from <https://www.holoniq.com/edtech-in-10charts#:~:text=2.,greater%20participation%20and%20population%20growth>
- Indiani, N. L., & Fahik, G. A. (2020). Conversion of online purchase intention into actual purchase: the moderating role of transaction security and convenience. *Business: Theory and Practice*, 21(1), 18–29. <https://doi.org/10.3846/btp.2020.11346>
- Fierro, I., Cardona Arbelaez, D. A., & Gavilanez, J. (2017). Digital marketing: a new tool for international education. *Pensamiento & Gestión*, 43, 241–260. <https://doi.org/10.14482/pege.43.10594>
- Kaputa, V., Loučanová, E., & Tejerina-Gaite, F. A. (2022). Digital transformation in higher education institutions as a driver of social oriented innovations. In C. Păunescu, K. L. Lepik, & N. Spencer (Eds.), *Social innovation in higher education innovation, technology, and knowledge management*. Springer.
- Karadag, E., Su, A., & Ergin-Kocaturk, H. (2021). Multi-level analyses of distance education capacity, faculty members' adaptation, and indicators of student satisfaction in higher education during COVID-19 pandemic. *International Journal of Educational Technology in Higher Education*. <https://doi.org/10.1186/s41239-021-00291-w>
- Liu, Q. (2020). Analyze the relationship between education informatization and informatization education under the education information system based on big data. *Journal of Physics: Conference Series*, 1648(2020), 032009. <https://doi.org/10.1088/1742-6596/1648/3/032009>
- Maisah, M., Mahdayeni, M., Maryam, M., & Alhaddad, M. R. (2020). Penerapan 7p sebagai strategi pemasaran pendidikan tinggi. *Jurnal Ekonomi Manajemen Sistem Informasi*, 1(4), 2020. <https://doi.org/10.31933/jemsi.v1i4.116>
- Maletin, S. (2017). Peculiarities of consumer behavior of Generation Z. *Russian Journal of Entrepreneurship*, 18(21), 3347. <https://doi.org/10.18334/rp.18.21.38560>
- Milos, I. (2017). Research: Sberbank has studied generation Z. The report of the bank is dedicated to centennials. Comptinggi. *Jurnal Ekonomi Manajemen Sistem Informasi*, 1(4), 2020. <http://www.sostav.ru/publication/issledovanie-sberbank-izuchil-pokolenie-z-25885.html>
- Mohr, K. A. J., et al. (2017). Understanding Generation Z students to promote a contemporary learning environment. *Journal on Empowering Teaching Excellence*, 1(1), 9.

- Moreno-Guerrero, A. J., Rodríguez-Jiménez, C., Gómez-García, G., & Ramos Navas-Parejo, M. (2020). Educational innovation in higher education: use of role playing and educational video in future teachers' training. *Sustainability*, 12(6), 2558. <https://doi.org/10.3390/su12062558>
- Morris, N. P., Ivancheva, M., Coop, T., et al. (2020). Negotiating growth of online education in higher education. *International Journal of Educational Technology in Higher Education*, 17, 48. <https://doi.org/10.1186/s41239-020-00227-w>
- Nasakaeva, B. E. (2021). Opportunities for the development of Internet marketing in the Republic of Kazakhstan. *Practical Marketing*, 5, 22–29. <https://doi.org/10.24412/2071-3762-2021-5291-22-29>
- Nauman, M. (2021). Attracting Generation Z Students to Higher Education Institutions (2021). *Doctoral Dissertations and Projects*. 2900. <https://digitalcommons.liberty.edu/doctoral/2900>. Accessed 23 Nov 2023
- Nurmalasari, N., & Masitoh, I. (2020). Manajemen strategi pemasaran pendidikan berbasis media sosial. *Journal of Management Review*, 4(3), 543–552. <https://doi.org/10.25157/mr.v4i3.4524>
- Rampelt, F., Orr, D., & Knoth, A. (2019). Bologna digital 2020 white paper on digitalisation in the European higher education area. Research Document. Hochschulforum. Retrieved February 25, 2021 from <https://hochschulforumdigitalisierung.de/de/news/white-paper-bologna-digital-2020>
- Rapatsevich, E. (2013). Innovations in education: the role of the information technology environment. *Successes of Modern Natural Science*, 10, 86–88.
- Rodríguez-Abitia, G., Martínez-Pérez, S., Ramírez-Montoya, M. S., & Lopez-Caudana, E. (2020). Digital gap in universities and challenges for quality education: A diagnostic study in Mexico and Spain. *Sustainability*, 12, 9069. <https://doi.org/10.3390/su12219069>
- Rukaeni, R., Fahyuni, E. F., & Rindaningsih, I. (2022). Marketing strategy for educational institutions during the COVID-19 pandemic based on social media. *KnE Social Sciences*, 7(10), 234–242. <https://doi.org/10.18502/kss.v7i10.11225>
- Sadyrova, M., Yusupov, K., & Imanbekova, B. (2021). Innovation processes in Kazakhstan: Development factors. *J Innov Entrep*, 10, 36. <https://doi.org/10.1186/s13731-021-00183-3>
- Schawbel, D. (2014). 66 of the most interesting facts about Generation Z. Danshawbel. Retrieved January 25, 2023 from <http://danschawbel.com>
- Seemiller, C., & Grace, M. (2017). Generation Z: Educating and engaging the next generation of students. *About Campus*, 22(3), 21–26. <https://doi.org/10.1002/abc.21293>
- Shahriar, S. H. B., Arafat, S., Sultana, N., Akter, S., Khan, M. M. R., Nur, J. M. E. H., & Khan, S. I. (2021). The transformation of education during the corona pandemic: Exploring the perspective of the private university students in Bangladesh. *Asian Association of Open Universities Journal*, 16(2), 161–176. <https://doi.org/10.1108/AAOUJ-02-2021-0025>
- Shamis, E., & Nikonov, E. (2020). Generational values in Russia for 2020. Retrieved January 28, 2023 from <https://rugenerations.ru/2020/06/17/https://weblines.blog/proizvoditelnost-stranicy/>
- Pichler, S., Kohli, C., & Granitz, N. (2021). DITTO for Gen Z: A framework for leveraging the uniqueness of the new generation. *Business Horizons*, 64(5), 599–610.
- Soboleva, T. N. (2014). Internet marketing of educational services. *Interdisciplinary Dialogue: Current Trends in the Social, Humanities, Natural and Technical Sciences*, 1, 148–155.
- Spears, J., Zobac, S. R., Spillane, A., & Thomas, S. (2015). Marketing learning communities to Generation Z: The importance of face-to-face interaction in a digitally driven world. *Learning Communities Research and Practice*, 3(1), 7.
- Stillman, D., & Stillman, I. (2018). Generation Z at work: How to understand it and find a common language with it. Moscow: Mann, Ivanov and Ferber. Retrieved January 25, 2023 from [http://fmsh.nis.edu.kz/wpcontent/uploads/2018/09/SHymkent-NISH-FMN-method\\_copilka-366.pdf](http://fmsh.nis.edu.kz/wpcontent/uploads/2018/09/SHymkent-NISH-FMN-method_copilka-366.pdf)
- Zahier, A. (2023). Statistics and trends of online e-learning for 2023. Retrieved January 15, 2023 from <https://www.websiterating.com/ru/research/online-learning-statistics/>
- Zarubin, M., Zarubina, V., Jamanbalin, K., Akhmetov, D., Yessenkulova, Zh., & Salimbayeva, R. (2021). Digital technologies as a factor in reducing the impact of quarries on the environment. *Environmental and Climate Technologies*, 25(1), 436–454. <https://doi.org/10.2478/rtuct-2021-0032>
- Zarubina, V., & Zarubin, M. (2014). Internet site as a way to promote the university. *Economics and Politics*, 1(2), 89–93.
- Zarubina, V., Akhmetov, D., & Gutnova, E. (2021). Web-service promotion of SaaS service for mining design. *Innovative Marketing*. [https://doi.org/10.21511/im.17\(4\).2021.05](https://doi.org/10.21511/im.17(4).2021.05)

## Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

**Submit your manuscript to a SpringerOpen<sup>®</sup> journal and benefit from:**

- Convenient online submission
- Rigorous peer review
- Open access: articles freely available online
- High visibility within the field
- Retaining the copyright to your article

Submit your next manuscript at ► [springeropen.com](https://www.springeropen.com)