

DunaKavics

A Dunaújvárosi Egyetem online folyóirata 2024. XII. évfolyam VIII. szám

Műszaki-, Informatikai és Társadalomtudományok

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MEGJELELENIK ÉVENTE 12 ALKALOMMAL

SZERKESZTŐBIZOTTSÁG

András István, Bacsa-Bán Anetta, Balázs László,
Nagy Bálint, Németh István, Pázmán Judit, Rajcsányi-Molnár Mónika.

Felelős szerkesztő Németh István
Tördelés Duma Attila

Vendégszerkesztő/Honorary editor Nargiz Hajiyeva

Szerkesztőség és a kiadó címe 2400 Dunaújváros, Táncsics M. u. 1/a.

Kiadja DUE Press, a Dunaújvárosi Egyetem kiadója
Felelős kiadó Dr. habil András István, rektor

<http://dunakavics.uniduna.hu/>

ISSN 2064-5007

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The role of marketing in the formation of a sustainable product policy in the automotive industry in Azerbaijan

Abstract: The role of marketing services in industrial enterprises, particularly in the automotive sector, is vital for socio-economic development. This study focuses on the automotive industry in Azerbaijan, specifically analyzing the alignment of consumer behavior and marketing mix components within the current business landscape. The objective is to explore the impact of social networks and broaden the marketing mix to refine product policy, using the Ganja Automobile Plant as a case study. The research identifies strengths and weaknesses in the consumer-sales complex, providing new strategies to enhance sales performance. Key insights are derived from data provided by the State Statistics Committee and the Ganja Automobile Plant, supplemented by domestic and international research. The paper reviews various marketing philosophies and shifts from traditional one-way communication to interactive two-way strategies facilitated by social media.

Findings from an online survey of tractor consumers reveal key demographics, including age, education, and brand awareness. The study underscores the significance of integrating social media into marketing strategies and enhancing the online presence of the Ganja Automobile Plant. Despite increased competition and growing demand for agricultural machinery, the plant has potential for expansion and export growth. The study concludes with recommendations for improving consumer satisfaction and adapting marketing strategies to align with evolving market needs and technological advancements.

Keywords: Marketing services; automotive industry; Azerbaijan; Ganja Automobile Plant; sustainability.

Összefoglalás: A marketingszolgáltatások szerepe az ipari vállalkozásokban, különösen az autóiparban, létfontosságú a társadalmi-gazdasági fejlődés szempontjából.

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[1] Humbatov, Y.–
Ismayilov, V.–Karimov,
F.–Mammadov S.:
Introduction to econo-
mics. Baku: 2020. -S.
pp. 200–215.

Ez a tanulmány az azerbajdzsáni autóiparra összpontosít, konkrétan elemezve a fogyasztói magatartás és a marketingmix összetevőinek összehangolását a jelenlegi üzleti környezetben. A cél a társadalmi hálózatok hatásának feltárása és a marketingmix kiszélesítése a termékpolitika finomítása érdekében, a Ganja Autógyárat esettanulmányként használva. A kutatás azonosítja a fogyasztói-értékesítési komplexum erősségeit és gyengeségeit, új stratégiákat kínálva az értékesítési teljesítmény fokozására. A legfontosabb meglátások az Állami Statisztikai Bizottság és a Ganja Autógyár által szolgáltatott adatokból származnak, amelyeket hazai és nemzetközi kutatások egészítenek ki. A tanulmány áttekinti a különböző marketingfilozófiákat és a hagyományos egyirányú kommunikációról a közösségi média által elősegített interaktív kétirányú stratégiákra történő áttérést. A traktorvásárlók körében végzett online felmérés eredményei feltárják a legfontosabb demográfiai jellemzőket, beleértve az életkort, az iskolai végzettséget és a márkaismeretet. A tanulmány kiemeli a közösségi média marketingstratégiákba való integrálásának és a Ganja Autógyár online jelenléte fokozásának jelentőségét. A megnövekedett verseny és a mezőgazdasági gépek iránti növekvő kereslet ellenére az üzemben van lehetőség a bővítésre és az export növelésére. A tanulmány a fogyasztói elégedettség javítására, a marketingstratégiáknak a változó piaci igényekhez és a technológiai fejlődéshez történő igazítására vonatkozó ajánlásokkal zárul.

Kulcsszavak: Marketingszolgáltatások; autóipar; Azerbajdzsán; Ganja Autógyár; fenntarthatóság.

Introduction

The significance of marketing services in the operational framework of industrial enterprises, crucial for the socio-economic development of nations, has been subject to scrutiny by economists and specialists both domestically and internationally, including Azerbaijan. Extensive studies, scientific research, and the authorship of monographs have been dedicated to understanding its role. However, despite research efforts within our country, there remains a gap in achieving a satisfactory comprehensive approach to research in this domain. [1] The purpose of the study in the automotive industry is to align consumer behavior and components of the marketing mix with the prevailing business organizational landscape. Additionally, it involves exploring the role of social networks within this sector on a global scale.

Based on the findings derived from analyzing these changes, the goal is to broaden the scope of the marketing mix within the automotive sector and refine product policy accordingly. The main goal is to study consumer behavior and marketing complexes that arise in the processes of managing marketing activities in enterprises related to the production of automobiles, and the object is automobile enterprises of Azerbaijan using the example of the production association “Ganja Automobile Plant”. [2]

[2] <http://senaye.gov.az/>

[3] <http://marketing.gov.az/>

The article examined the following:

1. Identification of weaknesses and strengths within the consumer-sales complex elements as they pertain to marketing activities within enterprises operating in the automotive and mechanical engineering sector, both locally within the republic and globally.
2. New proposals have been put forth to enhance sales performance.

The information base comprises data sourced from the State Statistics Committee of Azerbaijan and the Ganja Automobile Plant Production Association. The research incorporates the findings of both domestic and foreign authors on the subject, along with insights gleaned from the experiences of foreign nations, internet resources, and information provided by international organizations.

Discussions

Different views on the essence of marketing from the second half of the 1950s to the present day.

- Relationship Marketing Philosophy.
- Integrated Marketing Philosophy.
- Internal Marketing Philosophy.
- Performance Marketing Philosophy [3].

In the evolution of marketing research from the past to the present, the primary objective has shifted. Initially, the focus was on providing customers with additional incentives to make purchases. However, with the paradigmatic transformation in the 2000s, the central aim of marketing pivoted towards encouraging consumers to engage in brand-related conversations.

[4] <http://economy.gov.az/>.

[5] Philip, Kotler (2006): *According to Kotler the World's Foremost Authority on Marketing Answers Your Questions*. Baku, "Law" 2016. -S.

[6] Simon, Kingsnorth (2016): *"Digital Marketing Strategy: An Integrated Approach to Online Marketing"*. Harvard Business School Press, pp. 12–13. Alison: Scott Stratten.

[7] Olgu, Şengül (2018): *"Digital Marketing from A to Z"*. RNK, pp. 152–164.

[8] Gasimli, M.–Taliyeva, G.–Guliyeva, A.–Museyibov, F.–Mirzayev, A.–Gadashov–Ahmadova, G. (2023): *Digital economy*. Baku, pp. 162–170.

Today, aligned with the marketing and communication strategies of brands, there has been a transition from traditional one-way communication to interactive two-way communication with the target audience. This shift has led to the integration of communication channels and the development, modification, and diversification of integrated marketing communication approaches. [4]

The necessary conditions for the formation of a consumer market have been determined. These include:

- There must be people who share common desires and needs.
- There must be a desire and desire to satisfy the need [5].
- Must have purchasing power (money).
- A model called the black box model can be used to explain consumer behavior [6].

When choosing, consumers try to minimize the following risks:

Performance risk: The performance of the product we purchase may not be what we would like.

Financial risk: In this case, consumers may pay more for a product than it is worth or incur additional costs to use the product.

Time Risk: Delivery may be delayed or repairs may take longer [7].

Physical hazard: The product may cause harm to both people and other property, e.g. May explode when connected to a current.

Psychological risk: For example, they may be afraid to board a plane.

Social Risk: Confirmation of the purchase of the social environment. This risk is high among young people.

Risk of hypersensitivity: The product purchased may harm the five senses [8].

Consumer behavior is intricately shaped by a multitude of internal and external factors. Cultural, social, and personal factors wield significant influence over consumer purchasing decisions. Sub-factors within these categories include:

1. Cultural Factors:
 - Cultural norms and values.
 - Subculture.
 - Social class.
2. Social Factors:
 - Reference groups.
 - Family influences.
 - Social roles and status.

3. Personal Factors:

- Age and life cycle stage.
- Occupation and economic situation.
- Lifestyle and personality [9].

While marketers cannot directly control these factors, they must be taken into account when devising marketing strategies. Understanding the nuances of consumer behavior allows marketers to tailor their approaches effectively and resonate with their target audience.

According to the survey conducted among tractor consumers via the Internet, which garnered responses from 20 participants, the following insights were gathered:

1. *Age Distribution:*

- 50% of respondents fall within the age range of 35–50 years.

2. *Average Age:*

- The average age of the respondents is 65 years.

3. *Education:*

- All respondents are educated.

4. *Brand Awareness:*

- 50% of respondents are familiar with the brand.

5. *Product Awareness:*

- 55% of respondents are knowledgeable about tractors.

Given these findings and the elements of the marketing mix utilized today, further analysis and interpretation could provide valuable insights for marketing strategies tailored to the tractor consumer demographic [4].

On the other hand, when we look deeper into the 4P concept, it appears to be more business-oriented. The modern concept of marketing requires customer orientation. Accordingly, the 4Ps viewed from the enterprise perspective are considered the 4Cs from the customer perspective. 4C consists of the initials of the English words “customer decision”, “customer value”, “communication”, and “convenience” [10].

[4] <http://economy.gov.az/>.

[9] Nushaba, Gadzhieva (2018): *Marketing. Features of marketing in Azerbaijan*. Lambert Academic Publishing, pp. 523–536.

[10] Nushaba, Gadzhieva (2017): *Product policy in marketing. Study guide*. Ganja, pp. 325–333.

[11] Humbatov, Y.– Ismayilov V.–Karimov, F.–Mammadov, S. (2020): *Introduction to economics*. Baku, pp. 200–215.

[12] Hajiyeva, N. A.– Mammadov, S. C.– Gojayeve, Z. B., Mammadli, Z. T.–Shikhiyeva, X. (2001): *Digital economy*, pp. 133–142.

[13] Vugar Bayramov (2019): *The stability of the national economy*, pp. 101–110.

The questionnaire is distributed through trade agencies to buyers of equipment produced by the Ganja Automobile Plant. Based on the survey questions scored from a minimum of 1 to a maximum of 5, the responses are analyzed and submitted to the marketing department. Following this analysis, the elements of the marketing mix are scrutinized and developed accordingly. Key factors such as technical indicators of tractors, working conditions, economic indicators, versatility, regularity of operation, availability of service, design, and ease of payment are highlighted as crucial considerations. Improving product elements and pricing within the sales complex, as well as expanding the network of sales centers, are identified as important strategies moving forward [11].

According to the results of our survey, tractor consumers want to replace their tractors with new ones within 7–12 years, control the after-sales situation using many means of communication, so that a full-fledged customer business, which began in front of the Ganja Automobile Plant 19 years ago, today turns into a real customer. New means of communication include mobile phones, SMS, Internet, E-mail, video, and social media. Social media marketing is increasingly integral to the evolving landscape of marketing strategies. It's evident that social networks serve more than just platforms for everyday communication among individuals; they also play a crucial role in shaping consumer attitudes towards products or services. Social media enables companies to differentiate their offerings and effectively engage with customers at every stage of the marketing process. [12]

Automobile manufacturers are recognizing the importance of harnessing the power of social networks in their marketing endeavors. By leveraging social media effectively, they can tailor their marketing services to meet the evolving needs and preferences of consumers, thereby enhancing their overall marketing effectiveness. [13]

The company's Facebook, YouTube, and Instagram profiles provide objective, systematic, and digital representations of visual and comprehensible dialogue topics targeted at consumer audiences.

The goal of an enterprise public relations site is to ensure that users stay on the site long enough, have a good time, communicate with the institution when necessary, increase the level of relevance, and ensure continuity. By following the link “<http://ganjaauto.az>” you can familiarize yourself with many features of the company's website, ranging from corporate identity elements to the company's logo and contact information, product range, and company history.

As part of these goals, products are presented on the corporate website of the production association, videos are shown for advertising purposes, although information about the services provided after the sale is reflected, but information about the prices of companies and cars is not published. At the same time as developing a website, it is also important to provide information about sales agencies.

Research shows that the proper use of social media by businesses should be incorporated into marketing strategies. According to statistics, large car manufacturers allocate enough money for advertising on social networks. For example, Ford spends 55% of its advertising budget, Chevrolet 54%, and Nissan and Volkswagen prefer advertising on Facebook rather than on social networks alone. Mercedes, Honda, Cadillac, Hyundai, and Kia allocate almost half of their advertising budget to the YouTube platform [14].

Currently, along with the official page of the enterprise on the social network Facebook, there is a page of the trading agency Agrotextehizat LLC. Advertising and videos posted through Facebook were viewed by 5,000 users.

Research shows that the proper use of social media marketing by enterprises should be included among the strategies. Big car producers allocate enough money for advertising on social networks. For example, Ford advertising 55% of its budget, Chevrolet 54%, Nissan and Volkswagen only from social networks. They prefer to post ads on Facebook. Mercedes, Honda, Cadillac, and Hyundai allocate almost half of Kia's advertising budget to the YouTube platform [7].

Car manufacturers Infiniti, BMW, Porsche, and Volvo spend 30–40% of their advertising budget on Instagram. But as an example of a traditional means of communication, although we see the name of IB “Ganja Automobile Factory” at exhibitions and fairs, we cannot see it in television programs and television advertising [6].

Having analyzed the market position of the Ganja IS Automobile Plant, it is possible to further increase sales of a developing enterprise by determining sales directions.

Today, according to government statistics, there is a significant decline in tractor production, while imports are increasing in proportion to production. In 2022, the tractor manufacturing enterprise will increase its production capacity by 2.17 times compared to 2021 and will account for 33% of the total production capacity.

According to the State Statistics Committee, the number of trucks imported to Azerbaijan in January-November 2021 increased by 43.2 percent compared to the same period last year and amounted to 5,024 units. Of course, most imported cars are not new cars, but consumer demand is still growing.

[6] Simon Kingsnorth (2016): *"Digital Marketing Strategy: An Integrated Approach to Online Marketing"*. Harvard Business School Press, pp. 12–13. Alison: Scott Stratten.

[7] Olgu Şengül (2018): *"Digital Marketing from A to Z"*. RNK. pp.152–164.

[14] www.stat.gov.az

[3] <http://marketing.gov.az/>

[14] www.stat.gov.az

If we look at the annual reports of Goskomstat for 2020, we will see that most of the country's truck and bus fleet is more than 10 years old. For example, if there are 30,757 buses in the country's transport fleet, then of these there are 25,857, trucks – 154,659, and cars older than 10 years – 135,737 [14].

Despite the steady growth in the number of combines per thousand hectares of suitable crops, it's evident that there remains significant demand for agricultural machinery. This demand encompasses combines, tractors, trucks, and buses, indicating a substantial need within the country.

Moreover, the enterprise possesses considerable export potential, suggesting an opportunity to meet demand beyond national borders. Expanding production and leveraging export opportunities could be key strategies for addressing both domestic and international demand for agricultural machinery.

Conclusions and offers

The development of the economy in our republic has precipitated the rapid advancement of local industry. Recently, government initiatives, including industrial development programs and subsidies for agricultural machinery, have catalyzed growth in the automobile and engineering sectors. Government subsidies for farm machinery have spurred heightened demand for tractors and other equipment nationwide, consequently intensifying market competition. [3]

On the other hand, the exemption of agricultural machinery from import taxes has heightened competition between domestic manufacturing units and foreign company dealers. This underscores the significance of the findings and recommendations derived from a study conducted by the Ganja Automobile Plant IS, focusing on marketing strategies and sales enhancement through the lens of a local manufacturing enterprise:

The company produces tractors, combines, trailers, etc. for agricultural machinery, as well as trucks, buses, and municipal equipment. One of the main goals of the enterprise should be to study consumer behavior, analyze it, and find the right means of communication, as well as produce equipment according to their wishes and desires. As a result of an online survey that we conducted with local consumers on social networks, it turned out that 50% of tractor consumers are aged 35–50 years,

and 65% have secondary education. When choosing a tractor, 50% choose the brand. 55% of tractor consumers want to replace their 5–12-year-old tractor with a new one. If an enterprise that has produced more than 12 thousand tractors since 2008 achieves consumer satisfaction, then consumers who want to replace their equipment with new ones are real customers today. Today, the republic's tractor fleet is 35,000, and according to this result, 30% of tractors in the country are machines produced by the enterprise.

[14] www.stat.gov.az

The majority of the country's truck and bus fleet exhibits an age structure exceeding 10 years. For instance, out of a total of 30,757 buses in the transport fleet, 25,857 are trucks, while 154,659 cars, of which 135,737 are over a decade old. According to the State Statistics Committee, there is a demand for combined harvesters in the country. The burgeoning technological requirements within the nation have amplified the role of social media in enhancing communication with consumers [14].

Leveraging social networks facilitates a more accessible and convenient means to influence consumers' purchasing decisions. Globally, automakers allocate nearly half of their advertising budget to social networks, underscoring its significance in enhancing elements of the marketing mix and driving sales.

Through observation and analysis, it was determined that the promotion process is comparatively weaker than other components of the marketing mix within the company. This highlights the importance of addressing this aspect to bolster sales performance.

Although the company has taken its position in the market, the decline in sales recently is due to companies, discounts, etc. Therefore, you can have a positive impact on increasing sales. The "Strategic Roadmap for the Development of Heavy Industry and Mechanical Engineering in the Republic of Azerbaijan" noted that by maintaining the import of engines and transmission mechanisms such as cars, trucks, and tractors, other locally produced parts can be ensured, and 65% of agricultural machinery is produced in the country. Production within the country is the target.

Offers

- The enterprise should establish its presence in foreign markets by developing its localized model.
- Emphasizing advertising on social networks is crucial, as it provides a platform to study customers' preferences and desires while also necessitating careful maintenance of the company's image.
- By involving consumers in the sales process, it becomes possible to attract other customers, generating economic interest. To achieve this, the implementation of a membership card system is essential. Under this system, if a consumer with a membership card refers a new client, they will receive a bonus or service. Additionally, customers with expired warranty equipment could receive a certain percentage discount on spare parts, with special promotions for the purchase of original spare parts. Furthermore, repeat customers may benefit from discounts when purchasing equipment for the second time, among other incentives.

Marketing research shows that maintaining after-sales relationships with consumers, availability of services, and delivery services are an important factor in increasing sales. In connection with the production of trucks, the enterprise, together with KAMAZ, must begin the construction of new service centers on leasing terms and lay the foundation of the first service center in our territories liberated from occupation. Taking this into account, it is necessary to analyze the needs of manufactured equipment in the regions and take strict measures to open dealers in the regions following demand.

In general, the development of the economy in our Republic depends on the rapid development of the local industry caused. In this regard, the commodity policy using marketing tools is more appropriate to form.

Role of the banking sector in sustainable economic development – The case of Azerbaijan

Abstract: This study examines the role of the banking sector in Azerbaijan's economic development, focusing on its impact on credit expansion, GDP growth, and sectoral financial dynamics. The banking sector is crucial for financing small and medium-sized enterprises (SMEs), driving economic growth, and enhancing productivity through increased employment and investment. The study employs a panel VAR model to explore the relationship between regulatory capital, credit extension, and economic growth, highlighting how regulatory capital impacts loan-to-deposit ratios and GDP growth. Data from 2005 to 2022 indicates a strong positive correlation between bank loans and GDP growth, though the effect varies by loan size and capital regulation policies. The analysis reveals that bank loans and deposits significantly influence GDP, with deposits showing a stronger correlation. Despite improvements in the financial sector, including reforms and infrastructure modernization, Azerbaijan's banking system faces challenges in credit allocation and financial depth compared to regional and global benchmarks. The study identifies that a substantial portion of loans is directed towards households rather than productive sectors, impacting overall economic growth. Key sectors such as agriculture and manufacturing have seen decreased loan shares, affecting their development. The findings suggest a need for enhanced regulatory frameworks, better risk management, and targeted financial policies to improve sectoral credit distribution and support sustainable economic growth in Azerbaijan.

Keywords: Banking; Azerbaijan; VAR model; SMEs; sustainability.

Összefoglalás: A tanulmány a bankszektor szerepét vizsgálja Azerbajdzsán gazdasági fejlődésében, a hitelbővülésre, a GDP-növekedésre és az ágazati pénzügyi dinamikára gyakorolt hatására összpontosítva. A bankszektor kulcsfontosságú a kis- és középvállalkozások (KKV-k) finanszírozásában, a

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gazdasági növekedés ösztönzésében, valamint a termelékenység fokozásában a foglalkoztatás és a beruházások növelése révén. A tanulmány VAR-modellt alkalmaz a szabályozói tőke, a hitelbővítés és a gazdasági növekedés közötti kapcsolat feltárására, kiemelve, hogy a szabályozói tőke hogyan befolyásolja a hitel-betét arányt és a GDP növekedését. A 2005 és 2022 közötti adatok erős pozitív korrelációt mutatnak a banki hitelek és a GDP növekedése között, bár a hatás a hitelek nagyságától és a tőkeszabályozási politikától függően változik. Az elemzésből kiderül, hogy a banki hitelek és betétek jelentősen befolyásolják a GDP-t, a betétek pedig erősebb korrelációt mutatnak. A pénzügyi szektorban bekövetkezett fejlődés, többek között a reformok és az infrastruktúra modernizálása ellenére Azerbajdzsán bankrendszere a regionális és globális összehasonlítási alapokhoz képest kihívásokkal küzd a hitelallokáció és a pénzügyi mélység terén. A tanulmány megállapítja, hogy a hitelek jelentős része inkább a háztartásoknak, mint a termelő ágazatoknak irányul, amely hatással van az általános gazdasági növekedésre. Az olyan kulcsfontosságú ágazatokban, mint a mezőgazdaság és a feldolgozóipar, csökkent a hitelek aránya, amely szintén elősegíti a fejlődésüket. A megállapítások arra utalnak, hogy a hitelek ágazati megoszlásának javítása és a fenntartható gazdasági növekedés támogatása érdekében Azerbajdzsánban fokozott szabályozási keretekre, jobb kockázatkezelésre és célzott pénzügyi politikára van szükség.

Kulcsszavak: Banki tevékenység; Azerbajdzsán; VAR-modell; kkv-k; fenntarthatóság.

Introduction

The banking sector plays an important role in the management of financial resources and investments, the implementation of innovations and the protection of macroeconomic stability. In Azerbaijan, the banking sector acts as one of the main indicators of economic development, such as support for entrepreneurship and diversification of the economy. In addition to financial mediation, the banking sector plays a significant role in the implementation of strategic goals and objectives related to the sustainable development of the economy. By facilitating lending to emerging sectors such as agriculture, technology, and small and medium enterprises (SMEs), banks act as a catalyst for inclusive economic growth in creating employment and increasing productivity. Bank assets in Azerbaijan have grown significantly at an annual growth rate of approximately 10% from 2000 to 2023, reflecting the sector's expanding role in the national economy. The total assets of the banking sector as of January 2023 were about 27.6 billion US dollars, and the top five banks held about 60 percent of this total. In addition, the number of banks operating in the country has stabilized, competitiveness has been ensured and financial services have been improved in the country. Currently, there are 23 commercial banks operating in Azerbaijan, of which two are state banks, 11 are banks with foreign capital, and one is a branch of foreign bank. By influencing the economy, banks provide financial flows between economic sectors and entities by presenting the funds they attract

from depositors and investors to borrowers. Funds received from banks in the form of loans include the introduction of various new products and services to business entities, the expansion of existing business networks, the creation of new business entities, the introduction of innovation and innovations, and as a result, economic growth and revival occur. Banks play one of the main roles in protecting the economic interests of the population and enterprises by attracting deposits and savings [1]. Another important aspect that characterizes the banking system is its influence on social processes and the values it creates. For example, by supporting mortgage loan borrowers, banks play an important role in improving the living conditions of the population. In the market economy, banks perform important functions by directing financial resources to the most effective and safe investments and users in the short and long term. On the other hand, the place and role of the banks in the economy is closely related to the quality of their mediation services. In the last 10 years, the rapid development of digital technologies, especially the technologies of the Fourth Industrial Revolution, has led to significant changes in the banking sector. These factors fundamentally changed the role of banks in the economy. In this context, the emergence and development of fintech technologies can be cited as an example. Thus, there is a complex relationship between the banking system and economic development. Besides being the basis of economic development, the banking system implements the effective regulation and management of the financial sector by using the opportunities of economic power in the country. In the analyzes carried out by the experts of the Central Bank on the CIS countries, the important influence of macroeconomic and institutional factors on banking crises was clarified [2]. Maintaining adequate prudential standards for credit institutions provides security in times of crisis for borrowers with a high payment capacity, despite limiting access to credit for low-income families [1].

[1] Corina, S. (2018): *Young people perception of the role of banks in economy*. University Constantin Brâncuși. *Economy Series*, pp. 1–8.

[2] Nabiyeu, J.–Musayev, K.–Yusifzadə, L. (2016): Central Bank of the Republic of Azerbaijan. Banking competition and financial stability: Evidence from CIS countries. *Working paper series*, 4., pp. 1–19.

Literature review

The banking sector plays a crucial role in the economic development of the country by attracting deposits and directing them to productive investments, which stimulates economic growth. The role of the banking sector in the economy of Azerbaijan continues to grow, and in the last few decades, Azerbaijan has entered a qualitatively

[3] Stewart, R.–Chowdhury, M.–Arjoon, V. (2021): Interdependencies between regulatory capital, credit extension and economic growth. *Journal of Economics and Business*, 117., pp. 1–22.

[4] Bayraktar, Y.–Ozyilmaz, A. (2023): The role of institutional quality in the relationship between financial development and economic growth: Emerging markets and middle-income economies. *Borsa Istanbul Review*, 23., (6.), pp. 1–19.

[5] Vinh, X. (2018): Bank lending behavior in emerging markets. *Finance Research Letters*, (27.), pp. 1–6. <https://www.scopus.com/record/display.uri?eid=2-s2.0-85045201068&origin=inward&txGid=8e055973af61036697541d5b39cc54ad>

[6] Bank for International Settlements. (2016): *Literature review on integration of regulatory capital and liquidity instruments*.

new stage of development, transitioning from oil resource based economy to a diversified and inclusive economy.

In this regard, as a role of the the banking sector pays special attention to financial services that support small and medium-sized enterprises (SMEs), which are important for increasing employment and productivity. The granting of loans by the banking sector is the main mechanism in the economic development of financial institutions. Access to credit is critical to accelerating economic growth and development through business expansion, innovation and productivity. Regulatory capital links credit extension to GDP growth and promotes long-term economic growth [3]. This process not only facilitates investment in fixed assets, but also supports job creation and increases consumer purchasing power. In addition, a panel VAR model was used to examine the relationship between regulatory capital instruments, credit expansion and economic growth, and according to the corresponding model, regulatory capital reduces the loan-to-deposit ratio (which is used to capture volatile financing). At the same time, studies show that capital has a positive and persistent effect on GDP growth, while the loan-to-deposit ratio has a persistent negative effect on GDP growth over time. The effect of regulatory capital varies across loan sizes and is related to capital regulation policies [3]. In addition, channeling credit into productive investment rather than speculative activities is critical to ensuring that lending translates into sustainable economic growth. With the development of the financial system, diversified and strengthened financial instruments can facilitate trading and hedging. In this way, financial systems can influence resource allocation and thus economic growth by diversifying risks across industries and firms. In addition, the financial system can ensure economic stability [4].

Although the banking system is recognized as one of the main drivers of economic growth, there are conflicting issues regarding the creation of loans in the economy [5]. Empirical research on the likelihood of bank crises as a result of high capital and liquidity requirements has been proven, although studies have produced mixed results (BIS, 2010). The impact of these requirements on bank activity is primarily reflected in their balance sheets. For example, banks reduce interbank loans and increase the purchase of government securities to meet high liquidity requirements. Overall, higher capital and liquidity requirements reduce aggregate consumption, investment and aggregate output by restricting lending activities, even as they increase the resilience of the banking sector and reduce crises [6].

Data and methodology

In the article, literature from various sources was reviewed, the research methodology was referred to a reliable database. The database is based on macroeconomic indicators and specific indicators of the banking sector, including regression analysis referred to GDP growth, bank assets, deposit portfolio and non performing loans. Annual reports and sustainability reports of influential institutions such as the Central Bank of Azerbaijan, the State Statistics Committee of Azerbaijan, the World Bank and the International Monetary Fund were reviewed in the article. This comprehensive database has enabled a detailed analysis of the role of the banking sector in managing economic growth and will help to better understand its effects on the economic development of Azerbaijan.

In the conducted analysis, it is reflected that there is a strong correlation between the loans given by the banking sector and the relevant figures of GDP. On the one hand, this shows the positive effect of the expansion of bank loans on the growth of GDP. Admittedly, this result shows the importance of additional factors. Data on the volume of bank loans granted from 2005 to 2022 are collected and adapted to a common format.

Table 1. Credit, Deposit portfolio and NPL ratios in the banking sector, GDP trends

Date	Credits (million manat)	Deposits (million manat)	GDP (million manat)
2005	1441.0	1368.7	12522.5
2006	2362.7	2162.2	18746.2
2007	4681.8	4127.2	28360.5
2008	7191.3	6460.2	40137.2
2009	8407.5	6379.1	35601.5
2010	9163.4	7625.8	42465.0
2011	9850.3	9447.0	52082.0
2012	12243.7	10699.2	54743.7
2013	15422.9	12475.8	58182.0
2014	18542.6	15453.4	59014.1

2015	21730.4	23431.4	54380.0
2016	16444.6	22091.0	60425.2
2017	11757.8	20599.1	70135.1
2018	13020.3	21870.4	80092.0
2019	15298.2	24746.0	81896.2
2020	14530.4	23666.9	72578.1
2021	17119.8	29027.7	93203.2
2022	20184.0	36249.8	133825.8

Source: Compiled by the author (based on the information of the Central Bank of the Republic of Azerbaijan and the State Statistics Committee).

The effect of different parameters on GDP is evaluated by Pearson correlation coefficient:

$$r = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum (x_i - \bar{x})^2 \sum (y_i - \bar{y})^2}}$$

The conducted analyzes show that there is a strong correlation between the loans granted by the banking sector from 2005 to 2016 and the dynamics of the corresponding historical indicators of GDP. So, if we evaluate the impact of bank loans on GDP, it shows that there is a very strong positive relationship at the level of 0.772. If we evaluate the level of influence of other variables through the same method, the correlation coefficient for deposits is at the level of 0.935. Thus, although all three variables have a positive correlation effect on GDP, credit and deposits have a stronger effect on GDP. Considering all these mentioned, we can construct a multivariate linear regression model between the mentioned variables and GDP. It is possible to get acquainted with the regression statistics of the established model in *Table 1*.

Table 2. Regression statistics of the model

SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.936724075
R Square	0.877451993
Adjusted R Square	0.861112259
Standard Error	10703.15572
Observations	18

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2.00	12303595934.70	6151797967.35	53.70	0.00000015
Residual	15.00	1718363136.25	114557542.42		
Total	17.00	14021959070.95			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	19398.11087	6073.44044	3.193924607	0.01	6452.879005	32343.34274	6452.879005	32343.34274
Credits	-0.46980651	0.848983723	-0.553375168	0.59	-2.279372481	1.339759461	-2.279372481	1.339759461
Deposits	2.88719519	0.492750397	5.859346245	0.00	1.836922579	3.9374678	1.836922579	3.9374678

If we look at the significance coefficient (p value equivalent) of the F parameter given in the ANOVA part of the table, we can see that it is equal to 0.00000015. This means that the constructed model can be considered statistically significant. The R2 performance of the established model is 87%. If we look at the regression statistics of the model, we see that only the p-value of the effect of the deposit independent variable satisfies the appropriate confidence interval condition (95%). Thus, it is possible to model the linear regression relationship between deposits and GDP in the form given below:

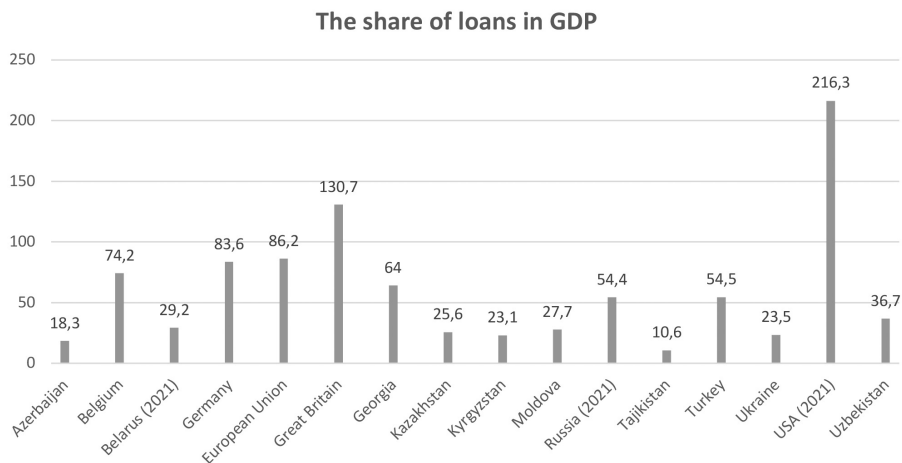
$$\text{GDP} = \text{Deposits} * 2.887 + 19398.11$$

Results and analysis

THE INTERRELATION BETWEEN THE BANKING SECTOR AND ECONOMIC DEVELOPMENT

In recent years, the improvement of the legal and regulatory framework in the financial and banking sector, modernization of the financial infrastructure, institutional development and the implementation of initiatives implemented by the state have led to significant progress in the financial and banking sector of the country. Considering the country's reliance on a bank-based financial architecture, the banking system plays an important role in financing the economy. The reforms carried out during the last decades led to a significant improvement in indicators of access to finance, and the role of the financial sector in the economy was significantly strengthened. Nevertheless, it is considered important to continue complex measures in order to reach the achievements of benchmark countries in this field. According to the results of 2022, the ratio of bank assets to GDP was 35.2 percent, which reflects the special weight of the banking sector in the economy and the financial depth of the banking sector. The specific weight of the credit portfolio in GDP was 14.6 percent, and its ratio to non-oil GDP was around 28 percent. According to the analyzes in the database of the World Bank, the ratio of loans given to all sectors by the financial sector in our country, except for central governments, is 14.7 percent of GDP. The relevant indicator is 67.4 percent in Georgia, 38.6 percent in Kazakhstan, and 49.6 percent in Ukraine (WBG 2023). Furthermore, in 2022, weight of loans given to the private sector in GDP in Azerbaijan was 18.3 percent. This figure is 64 percent in Georgia, 25.6 percent in Kazakhstan, 23.1 percent in Kyrgyzstan and 36.7 percent in Uzbekistan. In more developed countries, this indicator is higher, which means that there are more credit opportunities in the private sector. For example, 74.2 percent is in Belgium, 83.6 percent is in Germany, 86.2 percent on average is in the European Union, 130.7 percent is in Great Britain (WBG 2023).

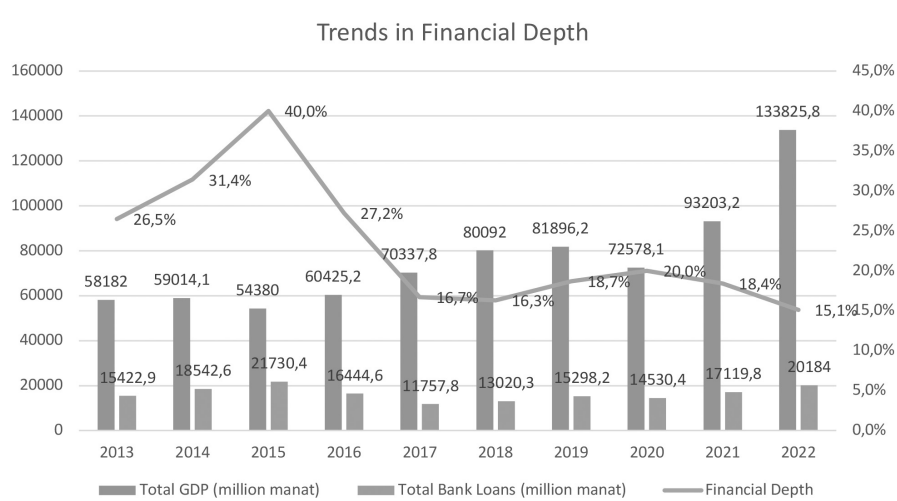
Figure 1. The share of credits provided to the private sector as a percentage of GDP by countries, 2022.



Source: WBG, 2023.

Statistical analyzes show that 55.9% of the loans provided by the banking sector in the country are directed to households. Among the economic sectors, the trade and service sector makes up the largest share of credit investments with 16.4%. Other important sectors of the loan portfolio include construction and real estate – 5.4%, industry and processing sector – 5.3%, and transport and communication sector – 3.9%. The Figure below shows that one of the main reasons for low credit investments in economic sectors is the allocation of credit resources to households and consumer loans, which actually leads to the restriction of access to financial resources for economic sectors (CBAR 2022). In the last ten years, the GDP in Azerbaijan has more than doubled from 58 billion manats in 2013 to 133 billion manats in 2022, and the total credit investments in the economy have increased from 15 billion manats to 20 billion manats. As a result, the financial depth of loans decreased from 26.5 percent in 2013 to 15.1 percent in 2022.

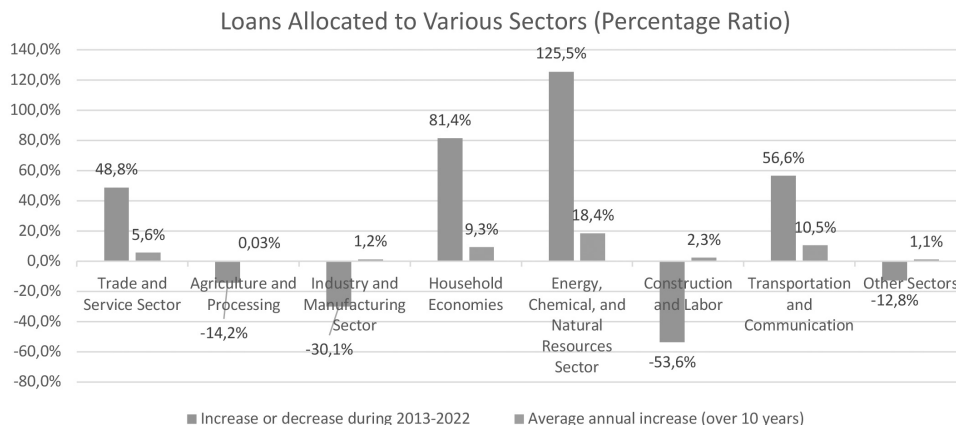
Figure 2. The interrelation between credit allocation to the national economy and GDP trends, financial depth, 2013–2022



Source: Compiled by the author (based on the information of the Central Bank of the Republic of Azerbaijan and the State Statistics Committee).

The analysis of the data shows that the specific weight of agricultural loans in the total loan portfolio of the banking sector has decreased in the last decade. Thus, the relevant indicator has decreased from 4.8% in 2013 to 3.1% in 2022. During the last ten years, the trade and service sector (2 percent increase in the share of the portfolio), energy, chemical and natural resources sector (1.3 percent increase in the share of the portfolio), transport and communication sector (0.6 percent increase in the share of the portfolio) had slight increases in the share of loans granted. On the other hand, the share of the industry and manufacturing sector in the total loan portfolio decreased significantly from 9.8% in 2013 to 5.3% in 2022. The largest decrease was in the share of the construction and real estate sector (15.3 percent in 2013, 5.4 percent in 2022).

Figure 3. Trends in credit allocations by sectors over the last decade (growth and average annual increase)



Source: CBAR, 2023.

As for loans allocated to specific sectors, an increase of 48.8% was recorded in the trade and service sector, 125.5% in the energy, chemical and natural resources sector, and 56.2% in the transport and communication sector whereas there has been a decrease in loans granted to other sectors. As a result, the highest average annual growth in loans to sectors over the past ten years was in the energy, chemical and natural resources sector (18.4 percent average annual growth), transport and communications (10.5 percent), and households (9.3 percent). A decline was observed in loans to agriculture (-0.03 percent), while the industry and manufacturing sector was also selected with low average annual growth rates (1.2 percent) (CBAR 2023).

The financing of the agricultural sector, which serves as a source of employment in the country's economy (over 30 percent in all periods), does not match the development trends of agriculture and lags far behind. Although the GDP of agriculture doubled from 3.1 billion manats to 6.3 billion manats in the last ten years, there was no increase in loans in the sector. Instead, the volume of agricultural loans decreased by 14.2 percent from the level of 2013, from 733.25 million manats to 629.09 million manats.

Conclusion and recommendation

The comprehensive analysis presented in the article examines the important role of the banking sector in Azerbaijan's economic development and highlights its importance in facilitating financial flows, promoting innovation and promoting inclusive development through strategic lending. Banks can finance infrastructure projects, support small businesses, promote financial inclusion, help create jobs, encourage savings and investments, support international trade, etc. instruments capable of promoting economic growth. The banking sector plays an important role in economic development by facilitating access to finance, expanding access to credit and promoting financial inclusion. By mobilizing resources for investment and providing credit to various sectors of the economy, banks enable businesses to invest in new technologies, expand operations, and enter new markets, which leads to economic growth. In addition, banks facilitate the flow of capital into the economy by offering various investment products to investors. The reforms and strategic projects carried out so far have played a key role in increasing the stability of the banking sector and its ability to respond to domestic and international economic dynamics.

However, the banking sector needs to be regulated and further improved. Developing a robust regulatory framework and risk management practices against banking crises is critical. In addition, comparative analysis with regional and global benchmarks, particularly in terms of financial depth and credit availability for economic sectors, reveals areas in need of improvement. Implementation of regulatory reforms, improvement of digital banking services, and sustainable banking practices have not only increased operational efficiency for Azerbaijani banks, but also expanded their reach to underserved populations. It has played an important role in promoting financial literacy, encouraging savings, investment and supporting the growth of small and medium enterprises (SMEs), which are important for diversifying the economy and reducing dependence on oil.

In order to increase the role of the banking sector in Azerbaijan, as a result of continuous economic reforms, it may be considered appropriate to consider the following recommendations to increase the efficiency of the country's banking system:

- Expanding access to credit for non-oil sector, agriculture, energy, technology and other strategically important sectors, along with innovative lending models, can increase the inclusion of the banking sector and stimulate economic growth;
- It is important to develop specialized financial services in relevant fields and to increase the role of the banking sector in diversifying the economy in order to improve access to finance, especially taking into account the importance and the role in the economic development, for SMEs;

- Increasing financial literacy: Capacity building for both the banking sector and the entrepreneur, holding educational events and investing in financial literacy programs can significantly increase the effectiveness of financial intermediation;
- Continuous improvement of the legal and regulatory framework is essential to increase the stability and resilience of the banking sector. This includes adopting international best practices in risk management and regulation to reduce the risk of banking crises and ensure sustainable development;
- Accelerating adoption of digital banking services and fintech can significantly improve the efficiency and accessibility of financial services. This transformation should focus on integrating advanced technologies to simplify banking operations, improve customer satisfaction and expand financial inclusion.



Integrative learning of agriculture and agro-tourism in geographical studies

Abstract: This study explores the integration of agriculture and agro-tourism within the geographical context of the Nagorno-Shirvan economic region of Azerbaijan. It investigates the role of natural and geographical factors in agricultural development and the potential for agro-tourism, focusing on areas with agrarian prospects. Key players in this sector, such as AZERSUN, GILAN, and AZZA AGRO, are highlighted for their contributions to agriculture and agro-industrial complexes. The research addresses the need for effective agricultural practices and the development of agro-tourism networks in mountainous and plain areas, considering the impact of population migration, food security, and regional economic growth. The study identifies challenges in the region, including insufficient production infrastructure, inadequate vehicle supply, and the effects of natural disasters like landslides and floods on economic activities. It emphasizes the potential of agro-tourism to enhance local economies by attracting tourists interested in farm experiences and agricultural processes. The research underscores the importance of improved territorial organization, risk management, and infrastructure development to support sustainable agriculture and agro-tourism.

Previous works, such as those by Pashayev and Aliyev, provide a foundational understanding of the region's socio-economic and environmental conditions. This study builds on their findings, offering new insights into the integration of agriculture and tourism. By proposing targeted scientific-practical recommendations, the research aims to address regional challenges and leverage opportunities for economic development through effective agricultural practices and agro-tourism initiatives.

Keywords: Integrative learning; agriculture; agro-tourism; geographical studies; recommendations.

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Összefoglalás: A tanulmány a mezőgazdaság és az agroturizmus integrációját vizsgálja Azerbajdzsán Nagorno-Shirvan gazdasági régiójának földrajzi kontextusában. Elemzi a természeti és földrajzi tényezők szerepét a mezőgazdaság fejlődésében, valamint az agroturizmusban rejlő lehetőségeket, az agrárjellegű kilátásokkal rendelkező területekre összpontosítva. Az ágazat olyan kulcsfontosságú szereplőit, mint például az AZERSUN, a GILAN és az AZZA AGRO, a mezőgazdasághoz és az agrár-ipari komplexumokhoz való hozzájárulásuk miatt emeli ki. A kutatás foglalkozik a hatékony mezőgazdasági gyakorlatok és az agroturisztikai hálózatok fejlesztésének szükségességével a hegyvidéki és síkvidéki területeken, figyelembe véve a népességvándorlás, az élelmezésbiztonság és a regionális gazdasági növekedés hatását. A tanulmány azonosítja a régió kihívásait, többek között az elégtelen termelési infrastruktúrát, a nem megfelelő járműellátást, valamint a természeti katasztrófák, például a földcsuszamlások és árvizek gazdasági tevékenységekre gyakorolt hatásait. Hangsúlyozza az agroturizmusban rejlő lehetőségeket a helyi gazdaságok fellendítésére azáltal, hogy vonzza a mezőgazdasági tapasztalatok és a mezőgazdasági folyamatok iránt érdeklődő turistákat. A kutatás hangsúlyozza a jobb területi szervezés, a kockázatkezelés és az infrastruktúrafejlesztés fontosságát a fenntartható mezőgazdaság és az agroturizmus támogatása érdekében. A korábbi szakirodalom, például Pashayev és Aliyev munkái, megalapozó ismereteket nyújtanak a régió társadalmi-gazdasági és környezeti viszonyairól. Ez a tanulmány az ő eredményeikre épül, és új betekintést nyújt a mezőgazdaság és a turizmus integrációjába. Célzott tudományos-gyakorlati ajánlások megfogalmazásával a kutatás célja, hogy a hatékony mezőgazdasági gyakorlatok és agroturisztikai kezdeményezések révén kezelje a regionális kihívásokat és kihasználja a gazdasági fejlődés lehetőségeit.

Kulcsszavak: Integratív tanulás; mezőgazdaság; agrárturizmus; földrajzi tanulmányok; ajánlások.

The science of geography consists of two main areas: physical and economic, and social. Both areas are integrated with each other. Physical and economic geography, in turn, combines various branches, including traditional and new areas. Geography has fields such as integrative plant geography with agriculture, soil geography, agricultural geography, and agro-tourism with medical geography and recreation geography. That is why agricultural specialists must know geography perfectly.

In modern times, the rapid increase of the world's population makes its supply with food products more urgent. Countries are implementing various measures to reduce dependence on imports. Here, two directions are distinguished: intensive and extensive. The intensive way involves increasing productivity with agro-technical methods. The main goal is to achieve quality change. Intensive agriculture is typical of countries with a high level of development, and extensive agriculture is typical of countries with a weak economy. Currently, a „green revolution” is taking place in some developing countries. The essence of the „Green Revolution” involves the use of modern agro-technical methods. As a result of their application, Turkey, Malaysia, Argentina, etc. obtained important indicators. Application of the intensive method in some areas of agriculture in Azerbaijan has increased productivity. Progress is being made in agriculture:

viticulture, almond orchards, grain growing, poultry breeding and cattle breeding in animal husbandry. The use of drip irrigation and chemical preparations, and the introduction of high-yielding plant varieties into the country should be evaluated positively. An agrarian-industrial complex is gradually forming in the country. As privatization took place during the land reform in Azerbaijan, the main agricultural enterprises are under the control of the private sector.

Companies with the main share in this field (purely agricultural and agro-industrial complex), such as "AZERSUN", "GILAN", "AZZA AGRO", "SABA", "MÂRJAN BROYLER", "SİYAZEN BROYLER", "Az-Granata", "AZNAR" and "VEYSALOGLU" group of companies. can be seen in *Figure 1*.

Figure 1. "Az-Granata" LLC, Agsu region



Studying the role of natural-geographical factors in the development of agricultural areas in mountainous and plain areas with agrarian development prospects, determining favourable opportunities and directions for the creation of new networks, and preparing relevant scientific-practical proposals are the main economic-geographical problems. As the topic is broad, the Nagorno Shirvan economic region, which is one of the 14 economic regions of the Republic of Azerbaijan, was studied in this research.

If taking into account the measures to regulate the migration of the population from the mountainous areas in the modern era, when the scientific and technical development is increasing, as well as the study of the agricultural areas that exist there, the level of provision of the population with food products, and the need to specifically study the development of agriculture and agro-tourism, it is possible to conclude that the Nagorno-Shirvan economic- there is a great need to study the areas mentioned in the geographical region. In order to understand the importance of the subject, the essence of agriculture in the region, the issues of its territorial organization, and the characteristics of development in accordance with the natural and geographical conditions should be explained at first.

[1] Mahmudov, M. M. (2011): *Regulation of socio-economic development of regions*. M. M. Mahmudov–I. M. Mahmudova. Baku: University of Economics.

[2] Abdullayeva F. (2010): Rural tourism: possibilities and perspectives. *Culture*.

[3] Constructive geography of the Republic of Azerbaijan (1996): [in 3 volumes] Chief editor: B. A. Budagov. Baku: Elm.

”The study of nature, the improvement of people's way of life allows for the correct analysis of its position in nature, and reveals ways of making its activity more efficient” [1].

The landscape, climatological, balneological, historical-cultural, manufactured products of rural settlements lead to the physical and spiritual recovery of people's labour force. If agriculture develops in a planned manner, then tourists from large industrial cities (Baku, Sumgayit, Ganja, Mingachevir) and foreign countries will show interest in agro-tourism. This field is reviving in our country. During the organization of agro-tourism, guiding, transportation services, and pet and bird feeding can be offered [2].

Agro-tourism involves recreation on farms, during which the tourist can get acquainted with agricultural production and participate in the process. It is impossible to evaluate the development of the agricultural sector in the region only by some indicator. The insufficient production infrastructure for the rural population and the poor conditions of enterprises, the poor supply of vehicles to residential areas do not allow the formation of Territorial Production Complexes in the area.

Since the research object is located in the natural disaster zone, the scientific research of N. A. Pashayev should be noted when considering the issue of evaluating the effect of the geo-synclinal factor during the territorial organization of production and non-production objects. In his research, Pashayev (...) gave the regionalization of landslides, floods and flooding, and grouped the region, including the administrative territorial units belonging to it, according to the degree of damage from the above-mentioned natural disasters and their recurrence. His work is important in studying the negative impact of natural disasters on the efficient use of the region's potential, population settlement and development of economic areas in the territory of the Nagorno-Shirvan economic-geographical region.

Aliyev (...) studied the geography of forest lands, the preparation of national land maps, the solution of environmental problems, the development of land reclamation, and biological and ecological biodiversity. He was the co-author and editor of 6 monographs, 13 books, and more than 50 maps. ”In many regions, in order to achieve a sustainable level of development of social infrastructure and recreation economy, the complex recommendations for improving its material and technical base and improving personnel supply have not been effectively used” [3].

N. A. Pashayev, N. H. Ayyubov and Z. N. 's monograph, ”Economic, social and political geography of the Republic of Azerbaijan”, which is (based on?)

Eminov's research work, talks about the demographic development and population settlement characteristics of Azerbaijan as a whole, as well as the development of economic sectors and social infrastructure sectors.

Figure 2. Academician Hasan Aliyev during scientific research



Source: <https://portal.azertag.az/az/node/26742>

In T. G. Hasanov's work (...) entitled "Economic-geographical zoning", the foundations, principles, factors and methods of economic-geographical zoning, the features of formation in various socio-economic systems, the economic-geographical zoning of the territory of the Republic of Azerbaijan, the forms of territorial organization of the economy in modern conditions, and the state of socio-economic development of regions policy are analyzed. E.Q. Mehraliyev, N.H. Ayyubov, M.O. in their monograph, "Issues of settlement of the population in the Azerbaijan SSR", related to Sadigov, discuss the implementation of settlement according to the aspect of dependence on the country's vertical zonation and inclination angle, the role of natural resources in the appropriation of the territory, and the historical stages of the modern state of settlement. Volume III of the work "Constructive Geography of the Republic of Azerbaijan", indicate the main directions of developing the country's economy: provide it with raw materials, specialize agriculture, design irrigation networks, roads, water and oil-gas pipelines in an efficient way, and make full use of the natural and material resources of the economic-geographical region.

In Z. S. Mammadov's monograph called "XXI century: Transport factor of economic development", the importance of the transport factor in the process of strengthening integration in the market economy is analyzed in terms of modern requirements.

[4] Agakishiyeva, G. R. (2007): *Economic-geographical and social problems of the development of Nagorno-Shirvan*. PhD thesis on geography. Baku.

[5] <https://portal.azertag.az/az/node/26>

The position of all areas of transport for economic cooperation is examined, and its development directions are considered.

Complex relief and harsh climatic conditions in the mountainous areas have revealed the need to study the level of social infrastructure provision of the population there. The scientists and experts of both the Republic of Azerbaijan and foreign countries paid special attention to the study of the standard of living of the population and the provision of social infrastructures. The analysis of the economic-geographical and social issues of the economic-geographical region was given in the thesis "Economic-geographical and social problems of the development of mountainous Shirvan" related to G.R. Agakishiyeva. The 2nd sub-chapter of the third chapter of the dissertation work is dedicated to the development opportunities of the existing infrastructure in the Nagorno-Shirvan economic-geographical region, and it is noted that the study of social infrastructure areas is of great importance [4].

Z. T. Imrani and K. Z. Zeynalova's research work, entitled "Economic geographical characteristics of the territorial organization of the economy in Azerbaijan", gives a broad economic-geographical analysis of the economy and its infrastructure areas in Azerbaijan and show its modern features. An economic-geographic assessment of the social life and economic activity of the population, the territorial organization of industry, agriculture, tourism and infrastructure areas are also provided. Each infrastructure area was analysed separately and their advantages in socio-economic development were noted.

N. T. Agamammadov's research work entitled "Regional characteristics and development model of providing social infrastructure to the population in mountainous areas" (2021) on the example of Daglig Shirvan economic-geographical region is a scientific work of sufficient quality about the state of social infrastructure areas in mountainous areas and future development dynamics.

ANAS academician H. A. Volumes II and III of the work "Geography of the Republic of Azerbaijan" published by the Institute of Geography named after Aliyev are considered one of the main studies in the economic and social study of Azerbaijan. "Geography reflects the stages of the formation of agriculture and industry, the formation of the geographical division of labour, the specialization of the regions of the country, changes in the socio-economic structure of society and scientific and technical progress" [5].

Since the research object is located in the natural disaster zone, the scientific research of N. A. Pashayev (...) should be noted in considering the issue of evaluating the effect of the geo-synclinal factor during the territorial organization of social infrastructure objects. In his research, Pashayev gave the regionalization of landslides, floods, flooding and grouped the region, including the administrative territorial units belonging to it, according to the degree of damage from the above-mentioned natural disasters and their recurrence. The aforementioned research work is important in the study of the negative impact of natural disasters on the efficient use of the region's potential, on population settlement and development of economic areas, on the level of provision of social infrastructure in the territory of the Nagorno-Shirvan economic-geographical region.

N. Pashayev, N. H. Ayyubov and Z. N. Eminov's The monograph "Economic, social and political geography of the Republic of Azerbaijan", which is research work, talks about the demographic development and population settlement characteristics of Azerbaijan as a whole, as well as the development of economic sectors and social infrastructure sectors. Here, the development of the social sphere, which is one of the components of productive forces, and its regional improvement, the effects of State

Programs on the effective location of productive forces at the country and regional level, the importance of population employment and the improvement of living conditions are elaborated on. [6].

Complex relief and harsh climatic conditions in the mountainous areas have revealed the need to study the level of provision of agricultural products to the population here. The scientists and experts of both the Republic of Azerbaijan and foreign countries paid special attention to the study of the standard of living of the population.

The result

1. There is a need to develop agriculture in areas with complex relief and harsh climatic conditions.
2. The organization of rural tourism in the regions on a scientific basis can lead to positive dynamics in solving the employment problem of the population.
3. The fact that the intensive direction of agriculture covers all areas is a guarantee of food abundance.

[6] Pashayev, N. A. (20017): *Economic-geographical problems of the impact of natural disasters on the economy in the Republic of Azerbaijan*. Abstract of PhD dissertation in geography. Baku.



Influence and contribution of the platform economy to the digital economy

Abstract: This study reviews key initiatives and research centers focused on the platform economy. Notable efforts include the MIT Digital Economy Initiative, which conducts research and organizes the Annual MIT Platform Strategy Summit, and Platformation Labs, which monitors trends in platform economics. Major consulting firms like Accenture also analyze platform business models and readiness. The Harvard Business School and Toulouse School of Economics are prominent in studying digital platforms, while the Observatory on the Online Platform Economy advises the European Commission on regulatory policies. Despite these advancements, challenges persist, such as the lack of a unified definition of the platform economy and inconsistent metrics across rankings. Current rankings, like those from the Boston Consulting Group and Forbes, show variability in criteria and methodology, underscoring the need for standardized evaluation methods. The study highlights the growing interest in platform economics but notes limitations in existing research frameworks and rankings, suggesting areas for future investigation.

Keywords: Platform economy; MIT Digital Economy; digital platforms; European Commission regulations; evaluation methods.

Összefoglalás: A tanulmány áttekinti a platformgazdaságra összpontosító legfontosabb kezdeményezéseket és kutatóközpontokat. A figyelemre méltó erőfeszítések közé tartozik az MIT Digital Economy Initiative, amely kutatásokat végez és megszervezi az éves MIT Platform Strategy Summitot, valamint a Platformation Labs, amely a platformgazdaság trendjeit figyeli. Az olyan nagy tanácsadó cégek, mint az Accenture szintén elemzik a platform üzleti modelleket és a felkészültséget. A Harvard Business School és a Toulouse School of Economics kiemelkedő szerepet játszik a digitális plat-

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[1] Guillen M. (2021): *The Platform Paradox. How Digital Businesses Succeed in an Ever-Changing Global Marketplace*. Philadelphia: Wharton School Press,

formok tanulmányozásában, míg az Online Platformgazdaság Megfigyelőközpontja az Európai Bizottságnak ad tanácsokat a szabályozási politikákkal kapcsolatban. Az előrelépések ellenére továbbra is vannak kihívások, például a platformgazdaság egységes definíciójának hiánya és a rangsorok közötti következetlen mérőszámok. A jelenlegi rangsorok, például a Boston Consulting Group és a Forbes által készítettek, a kritériumok és a módszertan tekintetében eltéréseket mutatnak, amely aláhúzza az egységesített értékelési módszerek szükségességét. A tanulmány rávilágít a platformgazdaság iránti növekvő érdeklődésre, ugyanakkor rámutat a meglévő kutatási keretek és rangsorok korlátaira, és a jövőbeni vizsgálatokra váró területeket javasol. **Kulcsszavak:** Platformgazdaság; MIT Digital Economy; digitális platformok; Európai Bizottság szabályozása; értékelési módszerek.

Introduction

The 1960s–2020s was a period full of events that served as triggers for the flourishing of digital business and the digitalization of industry, including the dominance of the platform business model. These technological triggers include the launch of PCs, computers, and laptops, the founding of the Internet in 1969, the democratization of computing power and computer memory and the use of semiconductors, the popularisation of smartphones with embedded applications, most of which use technologies based on the platform business model, the mass use of mobile Internet, the development of sensors and ubiquitous network access, which made it possible to collect and manage large amounts of information.

One of the most recent triggers, socio-economic and humanitarian, which reinforced the process of digitalization and the application of platforms in all spheres of economic activity and, consequently, the relevance and need to justify and analyze transformational processes, was the pandemic of coronavirus infection [1].

Methods

To solve the set goal and designated tasks, the research is based on the use of qualitative analysis with the use of observation and measurement, system approach, techniques and methods of grouping, generalization of theoretical and factual material, modeling, and tools of graphical interpretation of conceptual dependencies.

Results

Scientific centers for the study of platform economies and platforms. A search and review of the academic and journalistic literature reviewed research centers that have launched initiatives to study and measure the platform economy and its actors. The flagship initiative, which conceptually summarises and highlights the main achievements and innovations of the digital economy, is the MIT Digital Economy Initiative at the Massachusetts Institute of Technology (USA), which brings together digital fellows, graduate students, postdoctoral fellows, corporations that own platform solutions, and research groups that are periodically updated as research directions are updated [2]. As part of the initiative, the New Digital Business Models 2020 research group publishes an annual report, research articles, and reviews, organizes workshops, and representatives of the group co-chair the Annual MIT Platform Strategy Summit [3]. In 2015, S. Choudary, co-author of the bestselling book in the field of platform economics, *The Platform Revolution*, opened Platformation Labs to monitor processes in the platform revolution. One of his latest works is the annual report "The State of the Platform Revolution 2021", which covers platform regulation, inequality in the gig economy, platform strategy for traditional firms, etc. [4]. Consulting companies, especially Accenture [5], which tracks platform business trends and offers business consulting in digital transformation, are beginning to respond to the disruptive effect of platforms, which create new sources of added value for businesses and new markets. The company published a report in 2016, presenting a G20 Platform Readiness Index based on research conducted between January and June 2016. According to the Accenture team's findings, except the top five – the US, China, UK, India, and Germany - European and emerging markets lagged in platform readiness, which does not fully reflect the current state of affairs in the region. (Accenture. *Five Ways to Win with Digital Platforms*.) Former employees of technology companies that did not survive the digital revolution have begun to provide expertise [6].

[2] MIT IDE (2020): *Annual Report*. URL: <https://www.yumpu.com/en/document/read/65272899/mit-ide-2020-annual-report>.

[3] MIT Initiative on Digital Economy. *New Digital Business Models*. URL: <https://ide.mit.edu/newdigital-business-models/>.

[4] The State of the Platform Revolution (2021): URL: <https://platforms.substack.com/p/the-state-of-the-platform-revolution>.

[5] Accenture. *Five Ways to Win with Digital Platforms*. URL: https://www.accenture.com/us-en/_acn-media/pdf-29/accenture-five-ways-to-win-with-digital-platforms-full-report.pdf.

[6] Moazed A.–Johnson N. (2020): *Platform: practical application of a revolutionary business model*.

[7] European Commission. *The Digital Markets Act: ensuring fair and open digital markets*. URL: https://ec.europa.eu/info/strategy/priorities-2019-2024/Europe-fit-digital-age/digital-markets-act-ensuring-fair-and-open-digital-markets_en#what-are-the-next-steps

[8] National Center for Digital Economy. URL: <https://digital.msu.ru/>

[9] Kenney M.–Zysman J. (2016): The rise of the platform economy. *Issues in Science and Technology*, 2., (32.), pp. 61–69.

[10] Medium (2021): *MIT Initiative on the Digital Economy. Tagged in Platform Economy*. URL: <https://medium.com/mit-initiative-on-the-digital-economy/tagged/platform-economy>.

[11] Accenture: *Platform Economy: Technology-driven Business Model Innovation from the Outside in*. URL: https://www.accenture.com/t20160823T222808Z_w_/us-en/_acnmedia/Accenture/Omobono/TechnologyVision/pdf/PlatformEconomy-Technology-Vision-2016.pdf?en#zoom=50; Accenture. *Digital disruption: the growth multiplier*. URL: https://www.accenture.com/_acnmedia/pdf-14/accenture-strategy-digital-disruptiongrowth-multiplier-brazil.pdf.

Since 2017, the activities of research institutes and laboratories at universities have been intensified: H. Schmidt's Netzökonom blog (Technical University of Darmstadt, Germany), the TSE Digital Centre (Toulouse School of Economics, France), the Digital Business Institute and its Annual Platform Strategy Research Symposium (Boston University, USA). In 2018, the Observatory on the Economics of Online Platforms was launched to advise the European Commission on the development of regulatory policy for online platforms, including the development and amendments to the Regulation on Promoting Fairness and Transparency for Business Users of Online Platforms (P2B Regulation) and the draft new EU "digital legislation" – the draft Digital Services Act (DSA) and the Digital Markets Act (DMA), providing for changes to the provisions set out in the European e-commerce directive [7, 8].

In addition to academic centres, major non-profit organisations have been launched, which research the activities of platform companies, and their regulation in the country and represent the interests of business to the authorities at the national and international levels. *Table 1* summarises the results of the analysis of the current centers of study of the platform economy. Importantly, scientific associations have been launched to provide expertise to all branches of government on the regulation of platform companies. The relevance and importance of studying the platform economy and its subjects are confirmed by the complexity of research, which can be grouped into three areas: theoretical justification and formation of the conceptual field of digital and platform economies (studied mainly by universities and research institutes), analytics of the established market of platform companies and business counseling (implemented mainly by consulting agencies) and development of policies for the functioning of foreign and national platform companies in the country or region [9].

Table 1. Review of initiatives to research the platform economy and its actors

Year of creation	Name of institute, location	Name of the initiative	Research focus
1	2	3	4
2013	<i>MIT Sloan School of Management (MIT Sloan School) of Management</i> at the Massachusetts Institute of Technology, Cambridge, USA	<i>The MIT Initiative on the Digital; The annual MIT Platform Strategy</i> [10] Summit as a key event as part of the initiative.	<ul style="list-style-type: none"> – Identify key principles and systems that will help companies develop successful platform strategies and drive the digital transformation of work and commerce. – Exploring how companies are changing the way they do business by launching online platforms (using Uber, Airbnb, and eBay as examples). – Exploring the changing methodology for developing a successful platform strategy and how companies can maintain a competitive advantage in the digital age, even if they are not platform providers. <p>The research direction of the Sloan School of Management, dedicated to the study of platform economics and business, – "New Digital Business Models."</p>
2015	<i>Platformation Labs</i> is a consultancy and research firm specializing in research and application of platform strategies in various industries. Head - Sanjit Choudary	<i>Platform Thinking Labs</i> is a blog by S. Choudary that publishes research and reports on trends and the state of the platform revolution2).	<p>Research Directions:</p> <ul style="list-style-type: none"> – B2B platforms; – platform economy policy; – The disruption of the industry and future behavior of networks.
2016	<i>Accenture</i> [11] is an international consulting company based in Dublin, Ireland.	External Advisory Board "Technological Vision."	In 2016. Technology Vision external advisory board carrying out research together with <i>Accenture</i> , highlighting the platform economy as the third trend of the year. The company produces reports analyzing trends in the platform economy and its players – digital platforms.

Year of creation	Name of institute, location	Name of the initiative	Research focus
1	2	3	4
2016	<i>Applico</i> – international consulting company, New York, USA	<i>Platform Innovation</i> is a news blog by Applico with articles on trends in platform economics.	The company helps traditional businesses transition to a platform business model – Strategies for turning conventional products and services into platforms; – Regulatory challenges caused by influential platforms.
2020	Harvard Business School in Boston at Harvard Business School in Boston University of Cambridge, USA	<i>Digital Initiative</i> In addition to the news blog, the owners of the company released it in 2016. A guidebook on transitioning a business to a platform business model "Platform".	<i>Digital Initiative</i> Science Cluster Directions: – The reality of misinformation; – machine learning curve; – climate disruption; – creators of new technologies; – industry transformation; – the society meets technology; – a new space race; – for the public good; – the future of finance. A community was also created at the initiative, which aims to facilitate testing, learning, and innovation, and to offer interdisciplinary approaches applied to technologies and organizations.
2017	<i>Netzökonom</i> is the blog of Holger Schmidt, Professor at the Technical University of Darmstadt University of Darmstadt, Darmstadt, Germany	Lectures on platform economics; platform index. (<i>Platform Fund</i>)	– Analysis of the geographical distribution of platforms in the world and their ranking by market capitalization. – Creating and tracking a platform index.
Year of creation	Name of institute, location	Name of the initiative	Research focus
1	2	3	4

2018	Toulouse School of Economics at the University of Toulouse 1 Capitol, Toulouse, France	Toulouse School of Economics Digital Centre research center at the Toulouse School of Economics, Toulouse, France ⁶).	The work of the Centre is organized into 5 research areas: – digital platforms; – Big data analytics and economics; – Artificial intelligence and society; – Financial technologies and digital markets; – Intellectual property in the digital economy. One of the most active initiatives is an online seminar "The online Economics of Platforms. Seminar" (launched in 2020).
2018	PPMI, <i>Open Evidence</i> , RAND Europe, German Economic Institute, Cologne, Germany	<i>The Observatory on the Online Platform Economy</i> is a community of 15 independent experts and teams of European Commission employees, r. Brussels, Belgium ⁷).	The Observatory examines current and emerging issues and opportunities for the EU in the online economy and general internet search and advises the European Commission on policy-making on online platforms. It also monitors the implementation of the Promotion Regulations fairness and transparency for business users of online platforms (Regulation P2B).
2020	Questrom Business School Boston University, Boston, USA	<i>Digital Business</i> ; The annual <i>Platform Strategy Research Symposium</i> is a key event in the institute's activities.	One of the research areas of the institute is platform economics. Current topics: – Effective strategies for launching and growing the platform; – Rules for designing and managing a platform to build and maintain trust; – Strategies for complements to effectively engage with the platforms in which they participate.

The state of ranking of platform companies: analysis of practices and methodologies. Previously, an attempt has been made to sample international rankings of companies in which the majority of ranked economic agents use a platform business model, namely a review of the Boston Consulting Group (BCG) ranking of the "World's Top 50 Most Innovative Companies" (since 2004), the ranking of the analytical company CB Insights "World Unicorn Club List" (since 2013), the ranking of the "Top 100 Exponential Organisations" (since 2015) and Forbes magazine's ranking of the "Top 100 Digital Companies" (since 2018) 23. Several rankings of internet companies and startups not included in the earlier and current research can also be counted as rankings where the majority of companies will use the platform as the underlying business model.

A. Moazed and N. Johnson support this by stating that "platforms were virtually every Internet company that succeeded in the dot-com era, including Amazon, Angie's List, Monster.com, Shutterfly, and Yahoo" and "in the startup economy, the number of business platforms increases significantly in each new wave of large public companies".

In the course of studying this issue, an attempt was made to select ratings that assess the performance of platform companies directly and to analyze the methodology of compiling these ratings (*Table 2*).

Table 2. International and author ratings of platform companies

Year	Title	Source and method of sampling of companies	Types of companies	Criteria for ranking companies	Disadvantages
2017	Top 100 digital MNCs by sales or operating income UNC-TAD	Manual selection of all companies by their core business and the presence of a platform business model in the TNC source list from the <i>Bureau van Dijk</i> database.	Digital TNCs, viz: a) internet platforms, b) digital solutions companies; c) online shops (e-commerce sites); d) digital content companies	1. Affiliation with MNCs: a) their foreign income or foreign assets (or both) are more than 10 percent of the total, b) the existence of a significant number of subsidiaries outside the country of origin (excluding branches in offshore financial centers). 2. The inclusion of companies in the listing. 3. Presentation of relevant information on foreign sales and/or foreign assets.	1. Non-systematic compilation of the rating (it was compiled once in 2017). 2. Lack of information on the country of origin of companies. 3. A small number of companies represented in each sub-category of digital TNCs.

2016	Platform fund based on a platform index	Weekly check of the share price of listed companies on the stock exchange, and a sample of 15 platforms with the highest share price.	Platforms	The index is calculated using the price component of the profitability method and is compared to the <i>Dow Jones Industrial, Nasdaq Composite, and Dax 30</i> indices.	1. A small number of companies are included in the calculation of the index. 2. Lack of reports capturing the history of the index.
2017	Top 100 platforms by market capitalization in the billion USD	The author does not publicly disclose the source of the sample companies.	Platforms	The author does not publicly disclose the methodology for rating platforms.	Lack of information on sampling sources and methodology company rankings.
2019	43 digital platform companies	Manual selection of all companies by their core business and the presence of a platform business model in the original <i>Forbes Global 2000</i> ranking from 1995 to 2015.	Digital platforms	1. The inclusion of companies in the listing. 2. Analysis of 4 indicators: sales, profit, assets and market value.	Non-systematicity of the ranking (was compiled once in 2019).

The result of the analysis is the conclusion that there is a problem with systematizing the criteria for ranking platform companies, primarily due to the typology of platforms, which has not been definitively consolidated, and the difference in the metrics measuring their success depending on the sphere of their work (e.g. online commerce, financial services, digital media and games, search engines or social networks). Each of the above rankings has several uncertainties and to date, there is no universally recognized ranking that assesses the success of platforms.

Discussion

Interest in the platform economy and its subjects is also shown by the global scientific and business community. The limitations of the present study are: 1) the lack of a unified understanding of the concept of "platform economy", despite the operation of several research centers and launched initiatives, including scientific summits and conferences dedicated to platforms and platform strategies presented in *Table 1*; 2) the closed nature of the metrics underlying several rankings of platform companies, which makes it difficult to critically analyze them and to select a ranking for the sample of companies and their subsequent

[12] Accenture. *Digital disruption: the growth multiplier*. URL: https://www.accenture.com/_acnmedia/pdf-14/accenture-strategy-digital-disruptiongrowth-multiplier-brazil.pdf.

analysis. The results of this work can serve as material for scholars dealing with the problems of platform companies in their subsequent research, which requires reference to the fundamental works of scientists of these centers, as well as an aid in selecting one of the rankings or monitoring new ones for the analysis of platform companies [12].

Conclusion

Thus, the platform economy is an emerging promising core of the digital economy, which is a system of relationships based on economic activity built on digital platforms that allow buyers and sellers of products/services to make transactions, enhance indirect network effects, and create new markets. Its subjects are platform companies (two-sided, new markets) as intermediaries in the realization of the transaction and other companies, one of whose business models is platform. The platform economy is studied mainly by research centers and research institute.

Teaching commitment issues of unity of protected life and sustainable development

Abstract:

With the help of modern methods, the interest in training is increasing, and this is already bearing fruit in higher education. The learning process is not focused on the memorization of knowledge, but rather on the application of practical work, which is very important in terms of the integration of science and education. The development of presentation skills in seminar classes with modern methods helps to form the soft and hard skills of students. Replacing the traditional view of training with modernity creates conditions for students to have 21st century skills. By conducting a comparative study and reviewing the results, it is shown that as a result of the application of modern teaching methods to the teaching process, assimilation is higher than in lessons conducted with traditional methods. The research was carried out based on the performance of group work, surveys, test tasks, evaluation results, and the results were determined.

Összefoglalás: Ahhoz, hogy a tanulók gondolkodásában teljes világkép alakuljon ki, nagyon fontos az interaktív módszerek integráló irányú alkalmazása. A tanulási folyamat nem az ismeretek memorizálására irányul, sokkal inkább a gyakorlati munka alkalmazására, ami nagyon fontos a tudomány és az oktatás integrációja szempontjából. A szemináriumi órákon a prezentációs készségek korszerű módszerekkel történő fejlesztése segíti a tanulók lágy és kemény képességeinek kialakítását. A képzés hagyományos szemléletének korszerűsítéssel való felváltása megteremti a 21. századi készségeket a hallgatók számára. A kutatást csoportmunka, felmérések, tesztfeladatok elvégzése, holisztikus és elemző értékelési eredmények alapján végeztük, az eredményeket meghatároztuk.

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[1] Guliyeva Gulzar–Seyidova Antika (2020): Teaching chemistry with modern teaching methods. SSU. *Scientific news. Social and humanitarian sciences department*, 3., pp. 94–97.

Introduction

Educating the young generation capable of 21st century skills starts at school. The formation of competencies, such as soft and hard skills, which they will have in their future activities, starts from the period of education of the learners. Learners of various sciences should not only master the fundamental laws in the learning process, but also develop them from an experimental point of view.

Application of the presented materials from a practical point of view helps to develop various competencies in the students. For example, during the study of any science, no work was done from the point of view of financial literacy related to 21st century competencies, or it was at the minimum level. Unfortunately, later this problem was noticeable in their work. Along with the changes in the education system, the emergence of new learning technologies, as well as learning methods and their application, have already radically changed this approach. Giving the students project-oriented tasks has led to the creation of many skills in them, as well as financial literacy, which has been neglected until now, achieving this skill creates a better employability in the future labor market, as well as an advantage in terms of competition [1]. As we mentioned, this ground is created in the same process, that is, the acquisition of economic knowledge and skills occurs in parallel with the acquisition of scientific knowledge and skills during the teaching of the subject. In other words, students with financial literacy will develop these skills in the future and will not have difficulty working on projects in any enterprise, because they already have practical skills about it, they will be able to determine how important it is to design a project, calculate the costs to be incurred and implement these projects.

Objective of the research

The main goal of the work is to interpret the sequence of actions implemented by us so that learners acquire practical skills on protected environment and sustainable development. It is clear that these goals are currently facing all progressive humanity. As we know, since the beginning of the human society, it has used nature blindly, without measure and form, and as a result, today's reality has emerged.

The exhaustible sources of energy from natural resources have decreased day by day, and at the same time, a lot of damage has been done to the environment. We are in this business

In order to protect the environment and ensure sustainable development in line with the growing population, we have tried to bring to the agenda the work that learners will do with the facilitation of teachers and the projects that will be prepared as a result. Prospects of using water, air, solar and bioenergy resources related to inexhaustible energy sources existing in the north-western region of Azerbaijan are investigated by the students. As a result of this, the main goal will be achieved: protection of the environment, ecology and reduction of the cost of goods produced due to the obtained ecologically clean cheap electricity. This will also ensure sustainable development.

One of the main goals in this work is to organize the activity from the point of view that the learners have practical skills in green chemistry and green economy, as mentioned above. For this, we consider it important to master the knowledge in the field of photosynthesis through interdisciplinary integration [2].

Research methods

Modern methods of training were used in our research, which plays an important role in achieving results [3]. At the same time, during the training, the principles of training were kept in focus, which plays a specific role in acquiring practical habits [4]. For the full implementation of what we said, this process should be approached in the unity of modern and classical context. Because, by studying the traditional process comparatively, we can adapt the modern education system to the standards of the world education system. It is also important to follow the principles of didactics in this field.

The teaching method is based on the independent experiences, researches and hypotheses of the learners. At the same time, it is the determination of the ways of its implementation, the selection of the necessary resources and materials by the learners themselves. These activities can be organized as follows:

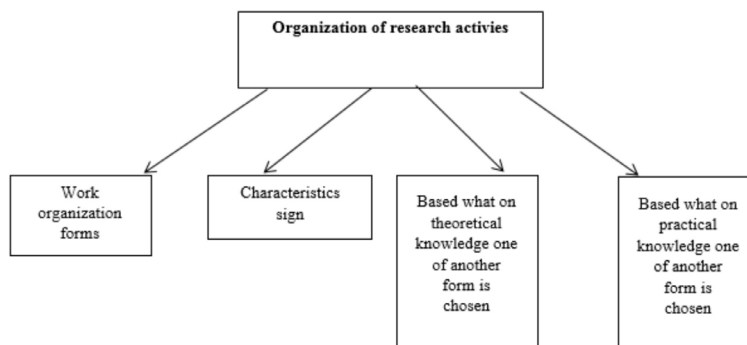
[2] RaziyeV Safar–Guliyeva Gülzar–Mammadova Sanubar (2023): From the experience of teaching photosynthesis process with interdisciplinary integration. PLUS. Scientific Works. 90., (2.), pp. 62–66.

[3] Veysova Zulfıyya (2008): What should a teacher be able to do to conduct an active lesson effectively? Part I/ facilitation skills. *Curriculum-scientific-methodical magazine*, 4., pp. 83–101.

[4] Pashayev Amrulla (2010): *Pedagogy*. Science and education publishing house.

[5] Mukarramoglu Mehdi (2015): Alternative and renewable energy sources play an important role in solving environmental problems. *People's newspaper*. 10., (11.).

Image 1. Organization of research activities



At the beginning of work with students, we also inform them about environmental factors that ensure the safety of human health. Here, at the same time, achieving economic efficiency as the conclusion of the process is brought to the fore [5]. After that, from the point of view of using alternative energy sources in environmental protection, the production of affordable products will be ensured in the North-West region of the republic.

In this field, a comparison was made between solar, hydro-aero- and bioenergy from renewable energy sources. In the meantime, we note to the students that man, who has a dominant position on earth, has the opportunity to protect himself from anthropogenic influences better than other living beings, because, as the only conscious being, he regulates his activities according to his interests. However, a person's desire to improve his living conditions and livelihood leads to an increase in factors that threaten his health. In our opinion, this process should be approached fundamentally so that our results have a practical effect. First of all, the roots of the problem, the specificity of our region for today should be taken into account. First of all, what are the traditional energy sources, as well as their prospects and final promise analysis should be determined here. It would be better to approach the issue from this point of view, taking into account the ability of energy to do work. On the other hand, we must be able to create and accumulate it. But here comes the second main issue: what potential energy sources do we have and how have we used them so far? It is no secret that non-renewable energy sources should be saved. Because these energy sources are blindly used from the beginning and are gradually depleted.

So, the way out of the current situation is through the use of more renewable energy sources. On the other hand, as a result of using non-renewable energy sources, the environment is damaged and ecological problems arise. We have air, water, land, etc. here. we can attribute pollution. This ultimately endangers human health. For example, the engine of 1 car burns 4350 kg of oxygen per year, which is more than the amount of oxygen needed to breathe for 10 people per year. At the same time, this engine emits 32 kg of carbon dioxide, 530 kg of carbon monoxide, 93 kg of toxic hydrocarbons and 27 kg of nitrogen oxides into the air during the year. Therefore, to ensure the health of the future generation, we must give priority to the use of renewable energy sources. The other side of the matter is that non-renewable energy sources such as gas, oil, peat, coal and uranium are not economically viable. Accordingly, since the cost of the products produced from the electricity purchased at the expense of these energy sources is high, their prices will be high. We see the way out of this situation in the use of renewable energy sources, which are more efficient in product production. It should be noted that only 0.02% of solar energy, which is one of the sources, is used by plants for photosynthesis. The solar energy used for heating the earth's dry layer, water bodies, and atmosphere returns to outer space after being used in certain natural processes. This circular process that we mentioned has been going on for millions of years. The positive aspect of using solar energy is that it is renewable on the one hand, and it is also used for one purpose on the other. In addition, solar cells are used in spaceships, household appliances, cars, street lighting, etc. is used. However, since the price of these devices is high, their use is not so economically profitable. Sun. One positive aspect of using solar energy is that, as mentioned above, this energy will last for many years, that is, as long as the sun exists. Taking into account the large number of sunny days in our region, the use of this source can be considered economically profitable.

Another renewable energy source for our region is wind, which is always available due to our location. However, the disadvantage of this source is that it requires a large area for the electricity generation facilities.

Biomass is one of the energy sources with the greatest potential in our region. It has too many resources. There are many remains of plants and animals, etc. includes. Since ancient times, the people of this region have used artisanal types of energy sources and are still using them today. Because the application of this energy is very simple. However, the low level of technology in its transportation, storage, and processing increases their cost. As a result, the useful efficiency of biomass heat generators is 0.04%. One of the renewable energy sources that promise great prospects for our region is water.

Therefore, since water resources are abundant, the cost of electricity purchased at its expense is low. For the future, it is possible to build dams in the bed of mountain rivers to install mini-hydro stations and generate low-cost electricity. However, taking into account that fish go to the sources of rivers to spawn, their passage should be taken into account during production.

Addressing what we said to the students, we can conclude that the use of renewable energy sources such as solar, wind, biomass and water in our region promises great prospects for future energy security.

[6] Raziyev Safar (2016): Environmental issues in the context of the globalized world. *Educational problems*, July 7. 3.

Thus, the cost of the products produced due to this energy will be lower, which will lead to an increase in economic efficiency.

Solving environmental problems promises its own effects in various areas of the economy. It should be noted that complex learning with skills in terms of applying ways to solve problems from an early age is of great importance in the development of young people who have been formed in the future as a staff. Because when a specialist suddenly starts working in a team without acquiring these skills, he will not be incompetent, but will act as a competent staff who has learned to cope with this work from an early age. Therefore, it is important to acquire such skills and habits in the training process.

In our opinion, the economic efficiency in the field of energy shows itself more prominently. So, as mentioned above, depletion of raw materials of non-renewable energy sources eventually poses great threats to energy security. Of course, by taking preventive measures, the use of renewable energy sources both prevents environmental pollution and fills the gaps in the energy sector. Regular work in this field is carried out at the state level in our republic. The operation of power plants using wind energy on the Absheron Peninsula in cooperation with companies from Japan, South Korea, and Arab countries can lead to special progress in this field. It is also possible to add hydropower plants to be built on the Araz River and electricity to be obtained based on solar batteries. At the same time, the heat that will be generated at various processing facilities due to biomass is also of great importance in ensuring energy security. The economic effects that will be achieved with the help of the above-mentioned issues will play an important role both in solving environmental problems and in highlighting the problem of energy security in the globalized world [6]. In this area, in our opinion, the main tasks are the protection of the living and non-living world of the environment that surrounds us globally, increasing the stability of the work of all areas of the economy, etc. includes.

IDENTIFYING OPPORTUNITIES FOR A GREEN WORLD AND SUSTAINABLE DEVELOPMENT

The urgency of environmental problems in the globalized world has already become a reality of the day, and taking into account the importance of this topic, we have conducted research in this field, and this process is being continued in accordance with the requirements of the day [6]. The positive results of these works have a positive impact on environmental protection as well as achieving economic efficiency. In our opinion, in order for the learners to have the above-mentioned characteristics, it is necessary to prioritize integrativeness in the educational process, as evidenced by the studies conducted on having economic progress as a result of interdisciplinary integration [7]. Because with the help of integration, even the weakest of learners acquires knowledge in at least several fields of science. In the article, we have tried to build our activity from the context of what learners can do, not what they know.

ENVIRONMENTAL AND ECONOMIC EFFECTIVENESS OF GREEN CHEMISTRY AND GREEN ENERGY MEASURES

In order to ensure the ecological and economic effectiveness of green chemistry and green energy measures, on the one hand, learners should be taught the importance of nature protection in a globalized world, and on the other hand, they should understand how important their energy security is. In the article, we try to highlight the parallel research of the directions mentioned above. The studies conducted in the fields we have indicated indicate that the economic efficiency will increase due to the environmental protection on the one hand, and the low-cost electricity to be obtained on the other hand [5]. We present this information to students in electronic and visual form. In this process, they are divided into four groups. This division is carried out in fully democratic conditions under the facilitation of the teacher. Brainstorming and carousel are chosen as training methods. In this double choice, the goal is first to get the groups to be united in order to find a solution to the problem

[5] Mukarramoglu Mehdi (2015): Alternative and renewable energy sources play an important role in solving environmental problems. *People's newspaper*. 10., (11.).

[6] Raziye Safar (2016): Environmental issues in the context of the globalized world. *Educational problems*, July 7. 3.,

[7] Askerov Shahlar (2017): Econophysical analysis of the relationship between monopoly and competition. *The Journal of economics sevens theory and practice*, 74., (1.), pp. 4–9.

[3] Veysova Zulfiyya (2008): What should a teacher be able to do to conduct an active lesson effectively? Part I/ facilitation skills. *Curriculum-scientific-methodical magazine*, 4., pp. 83–101.

[8] Mukhametdinova Aygul (2021): Laboratory work using the technology of critical thinking. "Photosynthesis" 6th class, 28., (11.).

together and to make it possible for them to compare the obtained results with each other. Because the names of the groups before the topic were appropriately accepted as the names of water, air, light and bioenergy at the research stage. According to the stages of the active lesson, the groups start working [3].

Consider an example of a task presented to learners during the pre-research phase:

Task 1. Write "yes" if the statement is true, "no" if it is false.

1. The process of forming organic substances from inorganic substances in chloroplasts using light energy is called photosynthesis.
2. Photosynthesis occurs only in cells with chloroplasts.
3. Chloroplasts contain the yellow pigment chlorophyll, which gives the plant its color.
4. Plants have devices for capturing light: long and short leaf blades.
5. The plant gets water and minerals from the soil.
6. Photosynthesis comes from the Greek words "photos" – light, "synthesis" – connection.
7. Light energy is not needed for the photosynthesis process.
8. Photosynthesis ability is the most important feature of green plants.

A practical work example is as follows:

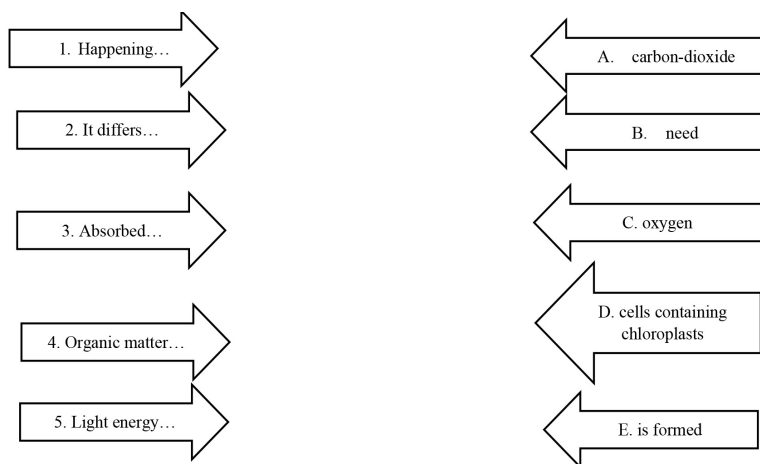
Carry out the experiment, observe and record the results.

In the last lesson, we take a sheet of black thick paper and cut out the word "light" on it [8]. We make an envelope from this paper and put a sheet inside. Place the plant in the sunlight.

The sequence of activities to record the result is as follows:

First, a task is given. A sample assignment is as follows.

Task1. Make correct sentences about photosynthesis. Write the corresponding number and letter in your notebook.



Task 2. "What will happen to the planet Earth if green plants disappear?" write an essay.

Task 3. Draw a conclusion about the process of photosynthesis using key words and write it in the notebook.

Evaluation criteria are mainly activity, cooperation, design, presentation, etc. can be taken.

Research results

In order to achieve the result, the subject material is given to the learners in electronic and mechanical form as information in the form of task sheets.

Web tools are also used in the evaluation, which ensures efficiency and transparency. Because being able to use ICT resources forms and develops hard skills in learners. As it is known, the work performed in the conditions of joint activity and cooperation becomes complete, and the qualities created in the learners in this process make it possible for them to have both soft skills and hard skills in the future, and at the same time, they fix their superior abilities as personnel accordingly. The performance of the groups is evaluated, and the groups have the opportunity to evaluate both themselves and the performance of other groups.

[8] Mukhametdinova Aygul (2021): Laboratory work using the technology of critical thinking. *"Photosynthesis"* 6th class, 28., (11.).

When organizing the form of work with pairs, we can choose the one related to the characteristics of the activity: strong student-weak student or both are equal in terms of success. Based on theoretical knowledge:

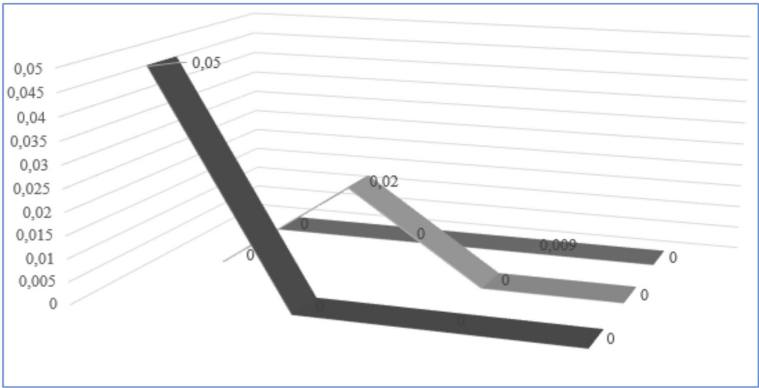
1. During the updating of acquired knowledge when the work ahead requires serious thinking initially. Pairs of students discuss the upcoming task.
2. In the course of laboratory and practical works, mutual control and mutual assistance can be organized. In the end, it is possible to evaluate the work done as a result of joint activity.

Examples of practical knowledge include:

1. Looking at the introduction guide, learners discuss the task among themselves when they need serious thinking about the practical work.
2. In the course of practical work, mutual control and mutual assistance can be organized.
3. Regarding the final instruction, it is possible to organize the evaluation of the work.

Organic substances produced during photosynthesis include carbohydrates (mainly sugar and starch), amino acids from which proteins are made, and fatty acids. For the synthesis of all these compounds, water (H_2O) and carbon dioxide (CO_2) from inorganic substances, nitrogen and sulfur are additionally needed for amino acids [8]. In addition, phosphorus and metal ions – iron and magnesium – can be included in the composition of organic compounds during photosynthesis. After the generalization process is carried out, the results of the groups are announced. It turns out that after calculating the results by groups in the evaluation phase, group III took the first place, group II took the second place, and group I took the corresponding third place. According to the results of the experiment, the distribution of the values obtained by the groups according to the relative error is shown in the diagram:

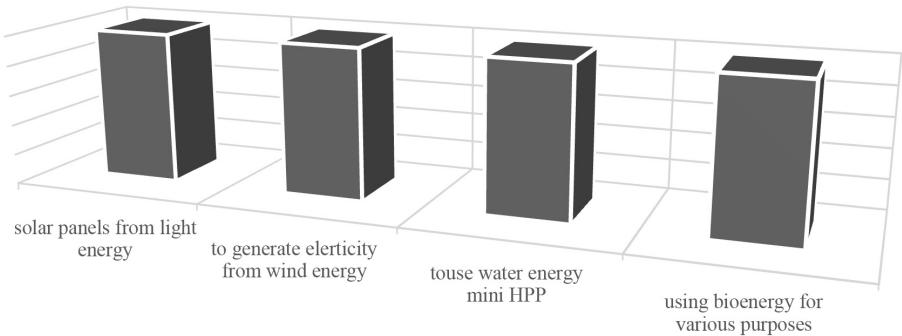
Diagram 1. Diagram of the according to the results of the experiment



Conclusion

As a result of research, our research on green economy and green development in the North-West region of the Republic helps to reach the following conclusions. We offer recommendations for solving these issues that we mentioned in the North-West region of the republic:

Diagram 2. In the north-western region of the republic



In the future, it is considered appropriate to use the methods mentioned above to help learners acquire practical skills in other areas. Implementation of learning with the help of various modern teaching methods facilitates acquisition and ensures consistent acquisition of knowledge as well as acquisition of skills and habits. In particular, the teaching of ecological and economic knowledge with the extracurricular integration of natural sciences, both theoretically and experimentally, ensures the acquisition of various competencies as well as the comprehensive assimilation of the material.

Galéria

Duma Attila fotói

























