The reform of the higher education of Ukraine in the conditions of the military-political crisis

Valentina V. Shevchenko*

The Department of Electrical Machines of National Technical University "Kharkov Polytechnical Institute", Kirpichova str., 2, Kharkov, Ukraine

A R T I C L E   I N F O

Keywords: Higher engineering education Training of foreign students Ukraine Reform of education Bologna process Autonomy of universities

A B S T R A C T

Ukraine is going through the consequences of the 2013 revolution and the ongoing hybrid war with the Russian Federation. The quality of life of Ukrainians has decreased, the basic economic indicators have deteriorated, the infrastructure, including educational institutions, has suffered, the level of education has fallen. But the crisis accelerated social reforms, including reform of the higher education system. The reform of Ukrainian high education follows the Bologna model, is conducted slowly, inconsistently, without a clear strategic plan and roadmap, carries the risks of destroying the old system without building a new better one in return. Universities are not provided autonomy, curricula require significant changes, and the system for making such changes is more flexible. Efforts are needed to preserve the attractiveness of Ukraine for international students. The reform of the system of higher education in Ukraine is an indispensable condition for the country to exit the crisis.

1. Introduction

In 2013, Ukraine experienced a revolution that was caused by corruption, social injustice and the rejection of the European course of reforms by President Viktor Yanukovych and his ruling party in parliament (in Ukraine the parliament is called “Verkhovna Rada” (Ukr.), “Supreme Council” in translation). The former president fled to the Russian Federation (hereinafter—RF) and is now accused by the General Prosecutor’s Office of Ukraine of high treason, since he asked the RF to introduce Russian troops into Ukraine. After these events, Ukraine for more than four years is in a state of actual war with the RF. Russia occupied the Crimea and part of two regions in the Donbas (Donetsk and Lugansk). On the territory of these regions, pro-Russian separatists declared the creation of two “people’s republics”–the Donetsk People’s Republic (hereinafter—DPR) and the Lugansk People’s Republic (hereinafter—LPR). The troops of RF are based on these territories and waging a hybrid war against Ukraine (OSCE, 2015; Freedman, 2014) (Fig. 1).

A hybrid war is an attack that an aggressor denies, or a war by someone else’s hands (for example, militia men). RF does not recognize their military’s participation in terrorist attacks and providing terrorists with weapons and ammunition (Freedman, 2014; Malyarenko and Wolff, 2018). In 2014, a civil aircraft Boeing 777-200ER of Malaysia Airlines flew from Amsterdam to Kuala Lumpur (flight MH17), was shot down by Russian military from the DPR’s territory from the Russian missile system “Buk”. 283 passengers and 15 crew members were killed. After the missile attack, the “Buk” was transported to the territory of the RF. The crime investigation of this terrorist attack is coming to an end. The RF denies its involvement in the tragedy, constantly puts forward new and new versions of what happened (Bachmann, 2014). Also RF used its veto power in the UN to prevent the creation of an international UN tribunal (Bbc.com, 2015). For this reason, the Netherlands is conducting its own investigation, since the majority of the dead on board the airliner were from this country (DSF, 2015; ASN, 2014; JIT, 2016). But after the end of the investigation in the Netherlands, an international court can still be created (de Hoon, 2017).

Given the hybrid nature of the war, martial law in Ukraine has not been introduced. Officially, Ukraine did not declare war on the RF. However, the USA, NATO, the EU and the United Nations (Congress of USA, 2017; NATO, 2017; European Parliament, 2015a; UN, 2016) clearly point to the aggression of Russia on the territory of Ukraine and the illegal occupation of the Crimea.

The General Prosecutor’s Office of Ukraine in 2014 declared self-proclaimed “people’s republics” as terrorist organizations (Echo of Moscow, 2014; Correspondent, 2014), and the Ukrainian government considers the territories under the control of DPR and LPR as temporarily occupied by Russia, along with the Crimea (Gorbulina et al., 2015).

By its aggressive actions, the RF breaks the system of collective security, challenges the entire world community, neglecting the norms
of international law, recognizing the borders of states, its obligations as guarantor of Ukraine's security under the Budapest Memorandum (1994), after Ukraine's refusal from the world's third nuclear arsenal and voluntary disarmament. RF is trying unilaterally to review the results of the division of spheres of influence in the world after the Second World War, has taken a course to restore the Soviet empire, which is impossible without Ukraine (Pabriks and Kudors, 2015). This means that the social reforms in Ukraine, including the reform of education, in the coming years will go in the conditions of war and occupation.

The Ukrainian government and Ukrainian society realize that independently, without the help of the world community, Ukraine will not be able to resist Russian aggression, return the occupied territories under its control and restore the economy (Davis, 2016). From a political point of view, the new government of Ukraine is legitimate (both the president and the parliament was elected in democratic elections). The leaders of the self-proclaimed republics and Crimea are regarded by Ukraine and the majority of countries as illegal (Veebel et al., 2014). The EU, USA and other countries imposed economic sanctions on RF by reason of annexation of the Crimea and aggression in the Donbass (Skuld, 2018; European Parliament, 2015b; Crimea Declaration, 2018; Davis, 2016). These measures restrain the Russian Federation from open war with Ukraine.

The new government of Ukraine has returned to the course of European integration, is trying to get rid of energy dependence on the RF, to counter the information war, conducts social reforms. There is a reform of the law enforcement system, the army's fighting capacity has been restored, as described by Mosoiu et al. (2017). But judicial, land, pension, medical and education reforms have just begun (CMU, 2018a). The visa-free regime with the EU and the reduction of trade duties within the framework of the European Integration Agreement (Agreement EU-Ukraine, 2014) are Europe's first steps in response to Ukraine's European aspirations and reforms.

But reforms are also conditioned by internal necessity. For example, the redistribution of state budget funds from social sphere to defense forces change the system of education and health management, the demographic crisis and migration processes are pushing for pension reform. Also in Ukrainian society there is a need to improve the quality of education. First of all, to effectively solve economic problems (Klyap and Klyap, 2016).

In the occupied territories of Donbass and Crimea there are higher educational institutions (hereinafter — HEIs), which are now not included in the educational system of Ukraine. Many Ukrainian students were forced to stay in the occupied territories and continue their studies in Crimea, LPR and DPR’s HEIs, some went to study in Russia and other countries, some were forced to stop studying and start working for the survival of their families. Due to the fall in GDP, inflation, increased military spending, Ukraine's spending on the education system has decreased. How Ukraine is going to compensate for these losses — we will consider.

2. Materials and methods of research

This review article analyzes the legislative acts of Ukraine, official statistics of Ukraine, international financial institutions and rating agencies, UN, NATO and EU resolutions, investigation reports of international non-government organizations, the data of sociological surveys, articles of Ukrainian and European press. Articles Press DPR, LPR and RF we did not use, since Russia is a side of military conflict and uses her media for propaganda, not for objective information coverage (Pysmenskyy, 2017). Single sources from the RF are the opposition press, which was not seen in propaganda, or reports without political assessments of events that were not covered by the Ukrainian press. The simultaneous use of the press and scientific publications makes it possible to present more widely the evaluation of reform in society and the academic environment.

The article assesses the role and effectiveness of work on the education reform of the Ministry of Education and Science of Ukraine (hereinafter — MES), interaction of Ukraine with the coordination bodies of the Bologna process, material support of HEI, students and teachers, attracting foreign students to study in Ukrainian universities. Also, the principle of forming new programs of higher engineering education in working on new standards of education was proposed.

3. Ukraine after the revolution of 2013

The war with the RF worsened Ukraine's already poor economic performance, but simultaneously forced the government to intensify current social reforms and start new ones. Taking into account the fact that since the collapse of the USSR, Ukraine's higher education has been constantly deteriorating, education reform has been going on for many years (Rumyantseva and Logvynenko, 2018). In 2014, a new stage of the education reform began, in the course of which it is necessary to take into account economic, human, infrastructural losses, new rules for the recognition of higher education diplomas, and migration processes.

3.1. Losses from war, occupation and corruption

As a result of the revolution and hybrid war with RF, Ukraine has lost control over part of its territory, the quality of life in country decreased, criminal situation worsened, there are significant human losses (killed and wounded). According to official data for 3 years more than 10 thousand people were killed in the territory of Ukraine (including MH17 victims) and about 22 thousand people were wounded (UNOCHA, 2016). According to the German newspaper Frankfurter...
Allgemeine (2015), which refers to sources in military circles at the beginning of 2015 the death toll was 50 thousand people. This is the maximum number of victims from all ratings that can be found.

Because of the conflict in the Donbas and the occupation of the Crimea, other countries have left 1.5 million Ukrainians, and there are 1.5 million internally displaced persons (UNHCR, 2018; UNOCHA, 2018). These people every day are forced to make a choice between medicines, food, habitation, heating (Ukraine — a country with cold winters) and education for their own children.

On the “line of delimitation” between the Russian-terrorist forces and army of Ukraine (5 km in each direction, the length of 457 km), many Ukrainians continue to live in their homes. Every day they have a risk of bombarded, blowing up on a mine or an unexploded ordnance. Quite often after the shelling, these people remain without electricity and water, do not have the opportunity to receive pensions and benefits, so they have difficulty passing through checkpoints. Many live in dilapidated houses. More than 1000 people suffered because of mines since the beginning of the conflict (OSCE, 2017; ICRC, 2018). The needs of people living on the “line of delineation” are similar in many respects to the needs of internally displaced persons: they need protection, shelter, water, sanitation and hygiene, food, non-food items, free movement through checkpoints, access to medical care and education, truthful information from the Internet and non-Russian TV channels.

With the participation of the REACH humanitarian initiative, it was possible to estimate the number of people who have limited access to education — 700,000 (UNOCHA, 2018). Minsk agreements, diplomatic negotiations both in the Norman format, and with the participation of the US State Department Special Representative for Ukraine Kurt Volker, do not lead to a cease-fire. As noted Haug (2016), OSCE Special Monitoring Mission’s constant presence in the conflict zone reduces the intensity of the shelling only slightly.

The 10th part of Ukraine’s industrial enterprises, power generation and distribution facilities, pipelines, residential buildings, health care and education facilities, motorways the Donbas, in the zone of armed conflict, were destroyed (Forbes, 2014). Life is much safer in territories where there is no military action. Here, people also feel uneasy about the war in their country, which marks Lakomy (2016). But still, the problems connected with the economic crisis, corruption, unemployment, and poor-quality reforms come to the forefront (IMF, 2017). As a result of the war and occupation, the economy of Ukraine suffered. The Gross Domestic Product of Ukraine (hereinafter — GDP) in 2014 and 2015 declined by about 30% per year, and only in 2016 there was a small increase in GDP (about 3%) (Minfin, 2018a; IBRD/IDA, 2018).

An industrial region Donbas was the principle coal and steel producer for Ukraine, and export of rolled metal is one of the main revenue items of the budget (Ukraine Today, 2017a, 2017b). Because of its occupation and military operations, coal production in Ukraine has declined, many chemical and metallurgical industries have stopped, which has affected the decline in GDP (Semenenko, 2016).

The currency of Ukraine, hryvnia (hereinafter—UAH), from 2013 to 2016, depreciated 3-fold against American Dollar (hereinafter — USD or $). The tariffs for housing and communal services increased several times (TNS, 2015, 2016). The unemployment rate increased from 7.3% in 2013 to 10.5% in 2017 (Minfin, 2018b), as shown in Table 1. Some scientists (Lukianenko and Oliskevych, 2015) are regarded such an increase in unemployment as "shock".

The problem of corruption is acute, the struggle against which does not bring tangible results. So, according to Transparency International (2016a, 2016b), Ukraine ranks 130th in terms of corruption from 168 countries, and the first among the most corrupt countries in Europe. The most corrupt spheres of life in Ukraine are state power, law enforcement system, education and health care. After the revolution of 2013, one of the main reasons for which was a high level of corruption, it did not decrease, but increased (Correspondent, 2016; IMF, 2017). Overcoming the corruption in education is hindered by extremely low salaries of school teachers and low salaries of teachers in HEI (Osipian, 2009; OECD, 2017). The only positive aspect is the growth of the population’s intolerance towards corruption (UIINA, 2015a).

Successful fight against corruption and effective social reforms were the main conditions for a formal rapprochement between Ukraine and the European Union. Therefore the fight against corruption is an indispensable component of all government reforms (IMF, 2017). Its program of fighting corruption is also in the MES (2018a). It deals with both the education reform and “domestic corruption” in the student-teacher relationship. "Domestic corruption” should be handled by the police and the administration of HEI. And MES has every opportunity to propose changes to laws. In this way, reforms must destroy old corruption schemes and not allow the creation of new ones. In the education reform, the most important step to prevent corruption related to admission to HEI has already been made: since 2008, the examination for all school leavers is conducted only in the form of an External Independent Evaluation (Pottroff, 2009; UCEQA, 2018). This exam is conducted by the Ukrainian Center for Evaluation of the Quality of Education, i.e. is not connected either with the school in which the graduate studied, nor with the university where he goes. From the 2018/19 academic year, a similar external independent evaluation is introduced for both graduate masters and school teachers (MES, 2018b).

Insignificant progress in the fight against corruption both in general and in certain areas, bear reputational losses for Ukraine and cause delays in new tranches of macroeconomic assistance from the International Monetary Fund (Bentzen, 2015; IMF, 2017). But the sphere of education is not decisive on the general internal front of the fight against corruption, since the level of corruption in education is half that of health care, and three times lower than in the interaction of officials and business (Correspondent, 2016; Transparency International, 2016b).

With the outbreak of the war, public spending on security and defense rose to 18% of GDP. This makes it difficult to carry out social reforms. In particular, the cost of education from 8.2% of GDP in 2009 fell to 5.4% in 2014 (Knoema, 2014). Given the decline in GDP in absolute terms, the decline is even more significant. Compensate for the reduction of educational expenses can:

1 Economic growth and GDP growth,
2 Increasing the effectiveness of the management of educational institutions. The first will require the cessation of the war and effective reforms, the second will be discussed in more detail later in the article. A slight improvement in the financing of education can be noted in 2016: up to 5.9% of GDP (CMU, 2018b) with a slight increase in GDP.

3.2. Diplomas of higher education by Ukraine, DPR, LPR and Crimea

Life in the peaceful territories of Ukraine under the control of the Ukrainian government is under civil law. Educational institutions continue to train Ukrainian and foreign students, issue them with diplomas of the state Ukrainian model. Ukraine is a member of the Lisbon Convention on the Recognition of Qualifications concerning Higher
Education in the European Region (Lisbon Convention, 1997; Council of Europe, 1997), and 22 bilateral agreements on the mutual recognition of educational documents and academic degrees. Due to this, Ukrainian diplomas are recognized in the USA, Australia, Canada, the People's Republic of China, in most European countries and in all countries of the former USSR (Finkov and Sharov, 2014). A special structure has been created in Ukraine that helps to quickly legalize diplomas of other countries in our country — the National Information Center of Academic Mobility. The center functions as part of a single European network ENIC-NARIC (NICAM, 2018). But in connection with the degradation of Ukrainian higher education, the number of countries that recognize Ukrainian diplomas may decrease. So, in 2011, Saudi Arabia decided not to recognize the diplomas of its students who studied in Ukraine (Osipian, 2015a). However, this is not a political decision. It concerns only the quality of education.

Diplomas of former Ukrainian HEI from the DPR and LPR are not recognized either by Ukraine or other countries (Delo.ua, 2015). MES canceled the licenses of all HEIs that remained in the occupied territories (MES, 2017a). Thus, young people whose future depends on education either had to change their place of study because of occupation and hostilities, or they would receive diplomas with which they could not leave the occupied territories. RF declares recognition of diplomas DPR and LPR in the future (iPress.ua, 2014a). Diplomas of HEI of the Crimea are issued to the Russian model and are considered legal only in the RF. Only a few countries (Afghanistan, Venezuela, Cuba, Nicaragua, Syria, North Korea) who do not consider the annexation of Crimea illegal and consider the Crimea as part of the Russian Federation have taken only the first steps to recognize Crimean diplomas in the future. Thus, entrants and students in the occupied territories are held hostage to the political situation.

Ukraine declares concern for such students: there have been established help centers “Crimea-Ukraine” and “Donbass-Ukraine” for HEI’s entrants; for those students who studied at the last year of higher education in the occupied territories, special conditions have been created for attestation and obtaining diplomas of the Ukrainian model. Also, students who found themselves in the occupied territories, Ukraine offers to move to the territories under its control, go to other universities or to the same universities if they were evacuated (Word and Action, 2017a). However, information on the work of the “Ukraine-Crimea” and “Ukraine-Donbass” centers was found only for the 2016/17 academic year. Probably, 2016/17 academic year the services of the centers of help were used by all those who wanted to leave for study in the territories controlled by Ukraine. It is known that the authorities of the “self-proclaimed republics” in various ways are trying to prevent the residents of the occupied territories from moving to territories controlled by Ukraine. For example, the decree of the head of the DPR Zakharchenko, A.V. No. 363 from December 15, 2017 prohibits the departure from the DPR to Ukraine of all state and municipal employees, including school teachers (Observer, 2018). Also, some authors note (Pysmensky, 2017) that Ukraine is losing the information war in the occupied territories, since their inhabitants do not have access to the Ukrainian media. Without access to the Ukrainian media, because of the low quality of life and due to the difficulties with the crossing of the checkpoints, many applicants and students decide to stay in the occupied territories. Perhaps they expect that in the future Ukraine will reconsider its decision on non-recognition of diplomas (Wilson, 2016). But while MES offers only a simplified procedure for re-certification (MES, 2016). This is in line with the policy of the MES to simplify the procedure for admission to HEI for residents of the occupied territories (MES, 2018c).

3.3. Educational infrastructure in the zone of combat operations and occupation

In the territory of the armed confrontation, educational institutions suffered: only at the beginning of the autumn of 2014, 65 injured general educational institutions, physical culture and sports facilities were reported (Kiev Times, 2014). The state of educational infrastructure facilities at the end of 2016/17 academic year was not known, since representatives both of international organizations and of MES do not have free access to them. It is only known that in the end of 2014 in LPR 6 HEIs continued to work, where more than 32,000 students were trained. In DPR there were 7 HEIs, in which 44 thousand students were trained. According to other sources (UNOCHA, 2018), at the beginning of the conflict about 700 educational institutions suffered. These data are published in a generalized form, so can’t be said how many schools suffered, how many HEIs. But there are data on universities: about 703,000 students and teachers from more than 3500 educational institutions experience psychological difficulties due to military conflict in obtaining education. Approximately 49% of affected students and the majority of affected teachers are women.

During the whole period of war, the number of students in the occupied territories has been reduced by about half. On the territory of the occupied Crimea, there were 29 HEIs (Online.ua, 2017). At the very beginning of the armed conflict, 10 institutions of higher education moved from the territories of DPR and LPR to the territory of Ukraine controlled by the government (iPress.ua, 2014b). At the end of April 2015, 20 universities were evacuated. Now there are more than 30 of them. 16 universities moved to other regions of Ukraine, but have their own information centers in the territories of Donetsk and Lugansk regions, controlled by Ukraine (MES, 2018d). 17 HEIs continue their work in the territories of Donetsk and Lugansk regions, which are under the control of Ukraine. Some students moved from the occupied territories together with evacuted HEIs or transferred to other HEIs in Ukraine (UIINA, 2015b).

Unfortunately, the MES did not present on its numerous websites transparent information about which HEIs now consider by self-proclaimed republics as their own, which HEIs were evacuated to the territories controlled by Ukraine, in whole or in part (Malyarenko, 2015).

4. Direction and progress of the reform of the education system of Ukraine

Ukraine has long determined that the model of the new education system should be the Bologna system. Formally, Ukraine became a full member to the Bologna Process since 2005 (EHEA, 2018). The country’s leadership has always positively assessed this direction of the education reform (Pavko, 2011; Governmental Courier, 2013), but the reform to this day can’t be considered either successful or complete.

The Bologna system was designed to make European HEIs more successful in competing with American HEIs. Ukraine is not ready for such competition, but some of the goals of the Bologna process were relevant for the country (Pavko, 2011):
- control of quality of higher education,
- academic mobility of students, scientists and teachers.

For this purpose, Ukraine was required to standardize scientific and qualification levels, introduce the European Credit Transfer System (hereinafter – ECTS), issue a European supplement to the Higher Education Diploma. In the countries of Western Europe, the Bologna process for the creation of a single European Higher Education Area (EHEA) was completed in 2010 (Governmental Courier, 2014; EHEA, 2010), but the Bologna coordinating bodies continue their work for those countries that joined the Bologna process, but did not achieve its goals. Ukraine is one of such countries. Work in the Bologna format is also continuing to improve the educational standards and technologies of the entire EHEA (Crosier and Parveva, 2013).

Some authors (Gutkevich and Onischenko, 2014; Shandruck and Shatrova, 2015; Rashkevich and Talanova, 2015) emphasize that the Bologna process is associated with globalization, which the education
system can use to its advantage. So, for the teaching of any subject, you can invite a specialist from anywhere in the world. A free choice of part of the academic subjects of students, the accumulation of loans, additions to European-style diplomas should promote academic mobility of students (Crosier and Parveva, 2013).

Ukraine made its civilizational choice: abandon the Soviet past, move to European society, break off relations with the RF, which wants to tighten Ukraine back into the new Soviet empire. The attempt to abandon this path for Viktor Yanukovych ended in a loss of power and flight. The main model of the education reform in the European space is the Bologna system. Therefore, it is not clear why the MES program documents on the reform of the education system of Ukraine do not mention the Bologna Process (MES, 2018e), why the Bologna's Reports of Ukraine (2012) are irregular and not very informative (Educational Policy, 2015). To determine in the state policy the activation of the work by the Bologna model is possible only thanks to many years of discussion in the academic environment (Zubchenko, 2016).

4.1. How the Bologna process takes place in Ukraine

The implementation of the Bologna system in Ukraine is difficult. There are many skeptics, and a conservative academic environment counteracts the transition to new forms of learning and knowledge assessment (Rashkevich and Talanova, 2015). Much is being done for "pro forma", since the MES is exerting administrative pressure on HEI, requiring reform without allocating enough finance (Finikov and Sharov, 2014). Misconception is widespread in Ukraine that the sphere of education can be reformed from within, relying on its high intellectual potential with limited external resource support. Practice has refuted this hope: without changes in the country's key laws, education standards, a consistent reform program, HEIs only predictably counteract the sporadic innovations of the MES.

During the reform of education in Ukraine all the time there was a lack of trust and cooperation between the state, business, education and society. Researchers have consistently noticed the lack of consistency, logic, purposefulness and coherence of effort, resulting in poor performance (Hladchenko et al., 2016; Rumyantseva and Logynenko, 2018).

It would be logical to start the reform with the standardization of scientific and qualification levels, educational institutions, and the introduction of ECTS in 2005, the first year of membership in the Bologna system (Gutkevich and Onischenko, 2014). However, even the process of standardizing the levels stretched for more than 10 years. The first changes in the law of Ukraine "On Higher Education" in accordance with standards of the Bologna Process were prepared for the period 2008–2011, as described by Finikov. A long period of development of changes in the law and parliamentary political compromises affected the content, conditioned internal contradictions, the preservation of a large number of rudimentary educational norms and the obsolete nature of the law from the moment of adoption. Conservatism in the minds of the majority of university management, poor explanatory work of the government and the MES led to a purely formal approach to European educational innovations (Rumyantseva and Logynenko, 2018). The new version of the law was ambiguously received by the academic community and representatives of the general public. The government tried to improve the situation. The negotiations between the government and the public concerned the expansion of the autonomy of HEIs, the quality of education and the limitations of the administrative functions of the MES. As a result, universities have gained more independence in the development of curricula for the preparation of masters and bachelors, but not in financial matters. The competence approach was not applied to teaching and evaluating its results, university autonomy remained the slogan, international and national mobility of students and teachers did not take place.

The ECTS introduced into the educational system of Ukraine in October 2009, but it became the basis for the organization of the educational process only in 2014 (CMU, 2014). Before that, it existed in parallel with the modular-rating system (Rashkevich and Talanova, 2015). In addition, ECTS has not yet become the basis for the development of higher education standards.

Until 2014, Ukrainian HEI assigned the scientific and qualification levels such as “junior specialist”, “specialist”, “candidate of science”, which did not comply with the Bologna system. Level “junior bachelor” was not. Some HEI for a long time did not assign graduates the level “master”, then they assigned “master” level simultaneously with the levels “junior specialist” and “specialist”. The level of "Doctor of Science" existed, but did not correspond to the level of the Bologna system. Graduates of HEI with “junior specialist” and “specialist” levels can’t go to work to other countries, since potential employers do not understand their qualifications (Hladchenko and Westerheijden, 2018).

For a long time, the notion of “accreditation level” was used to rank HEI. Along with colleges, the number of which was insignificant, there were technical secondary schools (in the previous system of HEI's accreditation – the 1st level) and vocational professional schools (in the previous system – 2nd level). Currently, these levels are canceled.

Now the reform of higher education is in accordance with the Law of Ukraine "About Higher Education" (Verkhovna Rada, 2014). According to this law, the scientific and qualification levels in the higher education system fully correspond to the Bologna agreement (Lokhoff et al., 2010):

1) junior bachelor,
2) bachelor,
3) master,
4) doctor of philosophy,
5) doctor of science.

And HEIs now subdivided into three categories:

1) a university,
2) academy, institute,
3) college.

Thus, it took Ukraine more than ten years to formalize the scientific and educational levels, each of which will need to develop educational standards, create and test curricula. This is impossible without proper material and methodological support from the MES. Too slow actions at this stage have already created a sense of permanent repair (Rashkevich, 2014; Rumyantseva and Logynenko, 2018). Further indecision can lead to even more disappointment and a decrease in the motivation of all participants in the reform (Rentzen, 2015; Kucherenko, 2017).

Also, the reform has an important side effect: to assess knowledge, the number of tests has significantly increased (OECD, 2012), which has shifted the emphasis in teaching students from an understanding of the subject and constructing logical relationships to training for successfully pass tests (Jacob and Rothstein, 2016). Students gradually lose the ability to critically analyze information, independently formulate questions and receive answers to them (Rumyantseva and Logynenko, 2018).

4.2. The norms of the new law "About Education", the action of which Ukrainians have not yet experienced

The norm of the new law "About Education" concerning the management and quality control of higher education has already been implemented – created new National Agency of Assurance of Quality of Higher Education (further – NAAQHE). The agency will have to form a unified base of diplomas on higher education, create new accreditation rules for specialties, approve education quality standards and ensure control over their compliance. But the results of the agency's work yet. The largest criticism about higher education concerns precisely its quality, which is due to the gap between spheres of work and education.
And HEIs are too conservative and clumsy for prompt response to changes in working conditions and technologies. How this problem will be solved by the NAAQHE is not yet clear. One and half year, since December 2016, the agency has been developing a strategic work plan and is participating in formal MES’s events (NAAQHE, 2018) as a ‘wedding general’. MES states that it is necessary to restart the NAAQHE, and up to this point it is going to duplicate its functions. So, in 2018, it is planned to develop educational standards “Doctor of Philosophy” (educational part) and ‘Junior Bachelor’, which instead of NAAQHE will be adapted by MES (RIA News Ukraine, 2018).

Also, the new law presupposes greater autonomy for HEI. This should allow more flexible adjustment of training programs to the needs of employers (CMU, 2018b). For this purpose, the law provides that the employer:

1) has the opportunity to take financial participation in the preparation of students in the specialties necessary to him,
2) has the right to include its representatives in the examination commissions of HEI or scientific institution of the Academy of Sciences for the assignment of qualification levels “junior bachelor”, “bachelor” and “master”. In fact, employers do not use this right and opportunity (Rumyantseva and Logvynenko, 2018).

The autonomy of HEIs is the main condition for the successful progress of the reform of the educational system in the near future (CMU, 2018b). But in order to strengthen autonomy, it will be necessary to abandon the ambitions of MES to continue to rigorously administer the work of HEIs – to form quotas for admission into HEIs, to distribute financing, etc. To do this, the Ministry will need to develop many by-laws to liberalize the rules for the work of HEI (Kucherenko, 2017).

Ukrainian HEIs have already received more academic freedom (in the choice of curricula and subjects), but autonomy is practically not felt in financial matters. This is related to the legislation of Ukraine on science: the necessary amendments to the Budget Code, laws on public procurement, etc., have not been made for autonomy (Bakirov, 2018).

4.3. Assessment of the role and effectiveness of the MES

The last three ministers of education of Ukraine, on average, held their office for at least two years. And this is enough to achieve tangible results in any reform (EC, 2015): the first year is necessary for the analysis of the situation and the development of a strategic plan, the second is for the first stage of the reform and its evaluation. Therefore, a frequent change of ministers can’t serve as an excuse for poor-quality reform and a lack of a road map for reforms. However, the current reform of education was started blindly (Fedorchenko, 2016; Hladchenko and Westerheijden, 2018). In the conditions of a deficit of finances and a clear plan for reform, the MES radically changed the principle of financing HEIs, which only leads to the destruction of the existing system (Kucherenko, 2017).

MES declares (MES, 2018e) that it is actively trying to explain to citizens of Ukraine exactly how the reform is going and that this work is proceeding successfully. For this purpose, numerous Internet sites have been created in different areas of work of the MES, and the Minister of Education grants many interviews to the Ukrainian media. At the same time the activation of the Bologna process is not announced, there is no prescribed strategy, road map of reforms. In 2015, the Road Map for the Reform of the Education System of Ukraine was developed by the International Renaissance Foundation (IRF, 2015), but the MES does not use it.

According to Fedorchenko (2016), the MES seeks to retain monopoly control over HEIs for as long as possible, especially in matters of funding, and therefore the minister in control issues shows legal nihilism and exceeds his authority, substituting for political expediency by legality.

MES also has little cooperation with the expert community (Fedorchenko, 2016). We are talking about experts-scientists who are not connected with HEIs, are not afraid to lose their jobs, and therefore are not afraid to openly criticize the ministry. Because of the lack of a clear plan for the reform of education, there is no reform of the ministry itself. Both for HEI’s teachers and for centers for independent assessment of knowledge, there are no conditions for competition that carry corruption risks (Osipian, 2015b).

The main reason for the poor quality of education is the chronic underfunding of both education (Fedorchenko, 2016), and HEIs’ science. So, the Ukraine allocates less than 0.2% of GDP to science. For comparison: in the USA allocates 2.9% of GDP to science, France–2.3%, Czech republic–2%, Lithuania–1%, India–0.8% (Chernaya, 2017). The MES says that it is necessary to increase the funding of science in HEIs to at least 0.3% of GDP, but does not indicate the need to increase funding for education. Therefore, in the coming years, funding for education can reduce (Gordon, 2017). To counter this, researchers (Bakhrushin; Fedorchenko, 2016) recommend that the MES use arguments that can be built into such a logical chain: the chronic underfunding of education and science for a long time has already led to a significant deterioration in the quality of education over the past 30 years (Repko and Ruda, 2017). The low quality of education in turn worsens Ukraine’s economic prospects. Due to the lack of highly qualified personnel, the science-intensive ferrous metallurgy, light industry and automotive industry are losing their competitiveness on the external and internal markets. These industries could fill the country’s budget much more, by producing products with high added value. Technologically backward it is possible to name agriculture which gives the main export profit after reduction of export of metal rolling. The low quality of education affects low ratings of Ukraine in such global ratings as the global competitiveness index (WEF, 2018), in which Ukraine ranks 81st, behind most countries in Europe, North America, and even some countries in Africa. With such arguments, the MES should appeal to the parliament (Verkhovna Rada), the Cabinet of Ministers and the society.

The fact that the government does not have a prescribed program of education reform, enshrined in the law, there is another important negative consequence: when the Prime Minister and the Minister of Education change, the achievements of the previous team is depreciated. Each new team begins its own reforms (OECD, 2016). For example, the former Minister of Education, Sergey Kvit, in his interview spoke about the need for educational reform, recognized the Bologna model of educational reform as successful, criticized the predecessors who paid insufficient attention to “university autonomy, academic mobility, interdisciplinarity and knowledge of the English language” (Governmental Courier, 2014). The new Minister of Education Lilia Grinevich also speaks about the need for education reform, initiated the adoption of amendments to the Law “About Higher Education”, which made steps towards the Bologna model, but does not speak of the Bologna process as a direction for reform, and focuses only on the quality of higher education (MES, 2018e). The head of Yulia Grinevich, the Prime Minister of Ukraine Vladimir Groysman, describing the reform of education, focuses on “decentralization, deregulation, institutional, academic and financial autonomy of universities” (CMU, 2018b). Again inconsistency and chaotic actions are obvious. All ministers of education criticize their predecessors, declare identical goals (first of all they promise university autonomy), and are equally unsuccessful in their attainment (Table 2).

5. Financial issues in the reform of education in Ukraine

The foundation of Ukraine’s modern education system was laid during the Soviet Union, when it was considered necessary to give higher education to as many of its citizens as possible, but did not care about the competitiveness of university graduates both domestically and abroad (Rumyantseva and Logvynenko, 2018). Thanks to this,
Ukraine ranks seventh in the world in terms of the number of people with higher education (Chernaya, 2017), but this does not, however, lead to an increase in labor productivity or to employers’ satisfaction with the quality of the workforce (Repko and Ruda, 2017). This imbalance in quantity and quality is reflected in the ratings – the UNDP Education Index (2016) and the Ranking of National Systems of Higher Education Universitas 21 (2018), where Ukraine occupies 40th among 188 countries and 38th among 50 countries respectively. The main reasons for the discrepancy between the quantity and quality of educational services are lack of funds and inefficient administration (OECD, 2017; Lukianenko and Oliskevych, 2015).

A significant problem of the Ukrainian education system is the low salaries of HEI’s employees and insufficient support of students in the form of scholarships (OECD, 2017). The reform of Ukraine’s education led to the redistribution of budget funds between HEIs and the change in the principle of accrual of student scholarships (CMU, 2016). MES responds with such actions to the budget deficit and criticism of poor management efficiency. MES follows by the way to reducing the number of HEIs that will receive government funding in the future, along the path of identifying the best HEIs and the best students. The best HEIs will get more budget places and grants, and higher academic success will be required to receive scholarships. But such tactics evokes criticism in society and the academic community (Marope et al., 2015; Nash Krai, 2017), since the criteria for choosing the best HEIs have not been widely discussed, are not spelled out in the long-term strategy of reform, often change, and the cancellation of scholarships for a significant number of students calls into question their the opportunity to continue to study (OECD, 2017; IRF, 2015).

### 5.1. Payment for studying

In Ukraine, for native students payment is possible both for state money (so called “budget places” by “state order”), and for students’ personal money. Foreign students pays only own money (so called “contractuals”). The number of students who study in HEIs in different specialties is regulated administratively by the MES. In total, about 1.5 million students study in Ukrainian HEIs, half a million less than the previous year. The reduction of the state order is connected, both with the demographic crisis in Ukraine (Repko and Ruda, 2017). There is a large imbalance between the actual education and qualifications of workers and the needs of the labor market. So, in 2016/17, in comparison with 2015/16, the MES reduced the state order for training students of social and humanitarian specialties by 10.8%, since there is an excess in the labor market. And state orders for natural and engineering (technical) specialties state orders remained at the level of 2015/16 academic year (Forbes, 2016). But for the 2017/18 academic year, the state order for engineering specialties is reduced by 6%. The dynamics of the change in the state order for the training of bachelors in various specialties is presented in Table 4.

### Table 2

Data on unemployment in Ukraine from 2013 to 2017 (thousand people).

| Year | Total population | Economically active population | Employment population | Unemployed population | Unemployment rate | Registered unemployed |
|------|-----------------|--------------------------------|-----------------------|-----------------------|------------------|----------------------|
| 2013 | 45,426.2        | 20,478.2                       | 18,901.8              | 1,576.4               | 7.7%             | 487.6                |
| 2014 | 42,928.9        | 19,035.2                       | 17,188.1              | 1,847.1               | 9.7%             | 458.6                |
| 2015 | 42,760.5        | 17,396.0                       | 15,742.0              | 1,654.0               | 9.5%             | 461.1                |
| 2016 | 42,584.5        | 17,303.6                       | 15,626.1              | 1,677.5               | 9.7%             | 467.2                |
| 2017 | 42,386.4        | 17,193.2                       | 15,495.9              | 1,697.3               | 9.9%             | 352.5                |

* From 2014—excluding the occupied territories (Crimea, Sevastopol, part of Donbass).

### Table 3

Number of HEIs and students in Ukraine during academic years from 1990/91 to 2016/17.

| Academic year | Number of HEI | Number of students, thousands |
|---------------|---------------|-------------------------------|
| 1990/91       | 891           | 1,638.3                       |
| 1991/92       | 910           | 1,615.4                       |
| 1992/93       | 911           | 1,574.7                       |
| 1993/94       | 913           | 1,509.9                       |
| 1994/95       | 1010          | 1,533.5                       |
| 1995/96       | 1037          | 1,540.5                       |
| 1996/97       | 1064          | 1,571.9                       |
| 1997/98       | 940           | 1,636.4                       |
| 1998/99       | 951           | 1,714                         |
| 1999/00       | 971           | 1,789.1                       |
| 2000/01       | 979           | 1,930.9                       |
| 2001/02       | 983           | 2,109.3                       |
| 2002/03       | 997           | 2,269.8                       |
| 2003/04       | 1009          | 2,436.7                       |
| 2004/05       | 966           | 2,575.2                       |
| 2005/06       | 951           | 2,709.1                       |
| 2006/07       | 920           | 2,786.6                       |
| 2007/08       | 904           | 2,813.8                       |
| 2008/09       | 881           | 2,763.8                       |
| 2009/10       | 861           | 2,599.4                       |
| 2010/11       | 854           | 2,491.3                       |
| 2011/12       | 846           | 2,311.6                       |
| 2012/13       | 823           | 2,170.1                       |
| 2013/14       | 803           | 2,052.7                       |
| 2014/15       | 664           | 1,689.3                       |
| 2015/16       | 659           | 1,605.3                       |
| 2016/17       | 657           | 1,586.7                       |

In 2017, 511.1 thousand enrollees filed applications to Ukrainian HEIs (Ukrainian news, 2017a), including 2.1 thousand from the occupied territories of Donbas and 1.1 thousand from the occupied Crimea. Of half a million new students, 60.9 thousand studied for state budget funds in 2017/18 academic year (People’s truth, 2018). About 200 students were accept for training in Ukrainian HEIs through the system “Crimea-Ukraine”, about 1 thousand students – through the system “Donbass-Ukraine” (Kherson online, 2017).

In 2015, the Minister of Education of Ukraine, Sergey Kvit, said that the practice to train students at the expense of state budget funds will be canceled (Business.ua, 2015), but now in Ukraine another Minister of Education (Lilia Grinevich). Grinevich’s team continues to use the state order (Correspondent, 2018). Unfortunately, the progress of the reform of education depends on personalities.

In the conditions of a lack of funds, the MES redistributes budget places in favor of the best HEIs, based on the preferences of the entrants (Gordon, 2017). The number of students who were trained at the expense of state budget funds in 2016/17 academic year was 266.2 thousand students. In 2017/18, the state order amounted to 212.4 thousand (Ukrainian news, 2017b), which is 17% less than in the previous year. The reduction of the state order is connected, both with the world economic crisis and occupation (Hladchenko, 2016), and with the demographic crisis in Ukraine (Repko and Ruda, 2017).

The state order for different specialties also varies depending on the state’s ideas about the needs of society and the market. So, in 2016/17, in comparison with 2015/16, the MES reduced the state order for training students of social and humanitarian specialties by 10.8%, since there is an excess in the labor market. And state orders for natural and engineering (technical) specialties state orders remained at the level of 2015/16 academic year (Forbes, 2016). But for the 2017/18 academic year, the state order for engineering specialties is reduced by 6%. The dynamics of the change in the state order for the training of bachelors in various specialties is presented in Table 4.

There is a large imbalance between the actual education and qualifications of workers and the needs of the labor market (Kasmin, 2014; Lukianenko and Oliskevych, 2017). Despite the fact that Ukraine ranks 7th in the world in terms of the number of citizens with a higher education, 24% of graduates of Ukrainian HEIs can’t find a job in the received specialty (Chernaya, 2017). This is due not only to the lack of jobs, but also to the discrepancy of the diploma with the real requirements for a specialist, the lack of necessary knowledge and skills (Lukianenko and Oliskevych, 2015). Also, opinion polls show that 30% of Ukrainians feel they have a higher level of education than is required...
to perform work (Kupets, 2015). This suggests that there is no feedback between employers and HEIs that train specialists for them. HEI not only do not study the needs of the labor market in order to train the necessary specialists, but also train too many managers, lawyers, psychologists who can’t find a job. Even the state order system does not correct the situation (Hladchenko, 2016).

To date, more than half of Ukrainians do not work by profession, and every third changed their profession immediately after graduation (Shpak, 2015). This means that the state order system, if it is not abolished, should remain in the future only for state enterprises and institutions. Quotas for other jobs should be formed with the participation of employers of private and communal enterprises. At the same time, there is an opinion (Zakharin and Denysenko, 2014), that Ukraine needs to preserve both the state order system and a sufficient number of HEIs of different profiles. Also, one should adhere to the strategy of providing higher education opportunities for the maximum number of students, as it was in Ukraine before the war (Rumyantseva and Logvynenko, 2018).

The data in Table 4 allow us to conclude that the number of HEI in Ukraine has declined by 30% over the years of independence. Now there are 657 HEI in Ukraine, but their number in the coming years should be reduced by 2 times - up to 317 (Forbes, 2015a). But this reduction should not be at the expense of closing, but at the expense of an enlargement, merger. The process of consolidation will be carried out at the request of the International Monetary Fund, the main creditor of Ukraine (IMF, 2015). Such an enlargement will also be conducted with secondary schools (IMF, 2016). This should favorably affect the funding of the remaining enlarged HEIs, since more funds concentrated in the same hands can help to implement larger reforms and make better use of state budget money. The merger of HEIs can cause conflicts on the ground (RIA News Ukraine, 2018) due to fears of job losses among teachers, the reluctance of students to change the educational institution in which they started to study, and the resistance of the administration losing power. When merging HEIs, it is important to preserve scientific schools, established teaching groups and the best teaching traditions (Semykin and Lebedchuk, 2012).

Three years ago budgetary graduates of HEIs received a directives, referrals for employment. They had working for at least three years at the workplace that was specified in the directive. This practice is called “allocation”. Such a system was created back in the days of the USSR, and it was logical, since all enterprises where graduates received directions had a state form of ownership (Rumyantseva and Logvynenko, 2018). If the alumni did not want to work at the specified enterprise, he had to compensate the state's expenses for his training. The Financial Inspection supervised the three-year working off. In 2015, the duty of the three-year working off was abolished for HEI's alumni, except medical (CMU, 2015). In 2017, obligatory three-year working off was canceled for medical alumni (Verkhovna Rada, 2016).

The reduction or cancellation of the state order for the education of students should occur simultaneously with the increased interaction of HEIs with potential employers. First of all, with industrial enterprises. To increase the training of specialists who after graduating from HEIs will want and will be able to work on the acquired specialty, the employer must clearly explain to HEI what the student needs to teach, and also calculate how much money it is profitable to invest to education of his future employee (Kupets, 2015).

For contract training, students often use their own families’ money. The opportunities of many Ukrainian families to help in training their children have become less with the outbreak of war and a decline in the quality of life. The situation could be improved through lending for education. But Ukrainian banks offer long-term loans only for the purchase of cars and mortgages (Today, 2017). Ukrainian banks have single credit programs for education. But under these programs, banks do not compete with each other, so the interest on such loans is too high. And the state does not compensate for such loans even partially. However, there is a tax privilege on income tax in case of payment of own higher education, higher education of children, spouse or parents (Verkhovna Rada, 2011). The privilege is intended for Ukrainian citizens, is provided for bachelor's and master's studies, but is not provided for in postgraduate studies, doctoral studies and preparatory courses.

### Table 4
Data on the state order for the preparation of bachelors in some specialties, thousands students.

| Year | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|------|------|------|------|------|------|------|------|
| Economics and Management | 17.60 | 18.18 | 11.90 | 15.03 | 13.70 | 13.12 | 10.13 |
| Law, jurisprudence | 10.18 | 10.46 | 8.50 | 9.50 | 9.43 | 9.07 | 6.85 |
| Computer science, IT technologies | 6.18 | 6.19 | 5.14 | 7.02 | 7.22 | 7.66 | 7.10 |
| Pedagogy | 6.66 | 6.40 | 5.73 | 6.55 | 6.40 | 6.315 | 4.41 |
| Constructing and architecture | 5.88 | 5.86 | 4.61 | 5.07 | 5.42 | 5.07 | 4.02 |
| Medicine | 4.25 | 4.44 | 4.79 | 4.79 | 4.82 | 5.46 | 5.78 |
| Agriculture | 4.57 | 4.71 | 4.21 | 4.63 | 4.63 | 4.27 | 3.55 |
| Electrical Engineering | 3.60 | 3.65 | 3.09 | 3.62 | 3.57 | 3.38 | 2.94 |
| Biology | 1.82 | 1.87 | 1.50 | 1.78 | 1.70 | 1.68 | 1.30 |
| Physics | 1.43 | 1.43 | 0.82 | 1.35 | 1.30 | 1.20 | 0.90 |
| Electronics | 0.99 | 1.03 | 0.90 | 1.19 | 1.16 | 1.08 | 0.92 |
| Chemistry | 0.97 | 0.96 | 0.71 | 0.90 | 0.91 | 0.85 | 0.78 |
| Metallurgy | 0.86 | 0.87 | 0.46 | 0.86 | 0.80 | 0.73 | 0.52 |
| Aviation and | 0.53 | 0.66 | 0.46 | 0.68 | 0.64 | 0.63 | 0.65 |
| Astronautics | 0.64 | 0.74 | 0.76 | 0.98 | 0.63 | 0.74 | 0.76 |
| Military Sciences | 0.41 | 0.45 | 0.37 | 0.45 | 0.42 | 0.40 | 0.35 |

5.2. Monetary and technical resources of HEIs

The poor funds and technical resources of HEIs affects both the quality of education and the ability to earn on training of foreign students. The MES plans to update educational and laboratory funds through the redistribution of state budget funds (Repko and Ruda, 2017). The reduction in the number of scholarships should free up funds to increase the salaries of teachers and support staff, to overhaul the academic buildings and hostels for students, to update the auditorium, laboratory and library funds, and the computer park.

After the reforms in secondary education, there is an imbalance in wages: school teachers began to receive salaries more than university professors. This, too, was an additional incentive for the work of university teachers abroad. Raising salaries for university professors will reduce the corruption risks of getting and extortion of bribes (Osipian, 2009; OECD, 2017), retain the best staff, rejuvenate scientific and teaching groups that are aging (Chernaya, 2017). It should also be remembered that low pay for teachers not only contributes to the "brain drain", but also reduces the prestige of the profession and teachers as mentors (Shevchenko, 2013).

HEIs should have more opportunities not only to earn their own money, but also to spend them on their own needs (Rumyantseva and Logvynenko, 2018). But if the money earned by HEIs first goes to the state budget, and then is allocated by the state for educational needs, too much is stolen by corrupt officials (IMF, 2017). Solutions to this problem can be not only the full autonomy of HEIs, but decentralization and the consolidation of communities (OECD, 2018), which is already being carried out by the government of Ukraine. Communities grow together in the same way as HEIs. Due to the enlargement, communities receive more funding, and therefore can implement more expensive, large-scale projects, including in education (Bulatova, 2012). Also, the Cabinet of Ministers has allowed scientific institutions to completely leave at their disposal incomes received from financial and economic activities (Chernaya, 2017).
5.3. Student scholarships

Large expenditure item of the budget of HEIs is the payment of student scholarships - about 6 billion UAH in the 2017/18 academic year (270.7 million USD) (112.ua, 2016; Today, 2018). Since January 1, 2017 the MES has changed the procedure for calculating scholarships (MES, 2017b). Now, students who passed the session “excellent” (all “5” on a five-point scale of knowledge assessment or “10”–”12” points on a twelve-point scale) receive enlarged academic scholarships. Typical academic scholarships are awarded to those students who have a high academic achievement rating. The 90% rating depends on the tuition fees and 10% on the criteria that are set by the HEI (for example, scientific, sports or social activities). Until the end of 2016, in order to receive an ordinary academic scholarship, it was enough to pass all the examination subjects to an average score of at least “4” (on a five-point scale of knowledge assessment) or “7” (on a 12-point scale). Social scholarships are also paid, for internally displaced persons; Participants in hostilities and their children; Persons affected by the Chernobyl accident; Orphans and children deprived of parental care; students 18–23 years old, who lost their parents during training; miners with an experience of underground work at least 3 years and their children; children of miners who became invalid at work; children of the heroes of Heavenly Hundred (from the number of 100 people killed by law enforcers during the revolution of 2013 in Kiev presumably on the orders of Viktor Yanukovych) (Word and Action, 2017b; CMU, 2016). The size of the scholarship is shown in Table 5.

40% of full-time budget students received academic scholarships in the 2017/18 school year. Students of “difficult” and “scarce” specialties (engineering, natural-mathematical, pedagogical – the last means teachers of chemistry, physics, biology, etc.) have a right to special enlarged scholarships. Social scholarships in 2017/18 academic year will receive 7% of students, academic enlarged – 3% (LPU, 2017). Thus, the Ministry of Education and Science again governs to HEIs how many % of the ratings are “excellent” they have the right to award. This adversely affects the system of knowledge assessment and prevents the establishment of the autonomy of HEIs.

For Ukrainian students, scholarships are not just a reward for success, but a matter of continuing education. For some (for example, for internally displaced persons) – even a matter of survival (Talanova et al., 2017). If a student has lost a scholarship and is forced to go to work – his education becomes a formality. In this case, students often get positive grades for bribes (Osipian, 2008).

Therefore, scholarships for all students of the budgetary form of education, without exception, should be set at a level not less than the subsistence level established by the Cabinet of Ministers of Ukraine (from May 1, 2017—1624 UAH, 62 USD) (Minfin, 2018c). Prestigiousness of HEIs, a high student rating and academic success, the choice of “difficult” and “scarce” specialties, or the special needs of a student for receiving social scholarships, should increase the minimum stipend with a certain coefficient. However, the MES has already reduced the number of students who receive academic scholarships, but has not fulfilled its promises (Surzhik and Onishchenko, 2013; Country.ua, 2017) by the size of scholarships at the subsistence minimum or minimum wage level.

5.4. Workplaces for students

The extremely low amount of academic scholarships and their limited number leads to the fact that many students are forced to go to work, and, most often, not in their future specialty. This increases the number of absences, reduces the overall level of training (Shpak, 2015).

But students of engineering specialties in Ukraine do not have the opportunity to get a job either in HEIs themselves or at enterprises for which the HEIs prepares specialists. To create such jobs, Ukraine can use the experience of such countries as Canada (Education in Canada, 2018), Germany (Lechner, 1999), Great Britain (Robotham, 2012). Positive and negative aspects of this practice have already been studied: stress issues from high workloads with simultaneous work and training, economic effects, motivation questions, etc. There is a mutual interest of students, HEIs and industrial enterprises in such cooperation: students receive wages and motivation to study, enterprises choose the best students for future work on an ongoing basis, HEIs better understand the needs of enterprises and change their training programs more quickly.

The creation of temporary jobs for bachelors who continue to study, according to Lukianenko and Oliskevych (2017), will help to reduce informal (shadow) employment, which in Ukraine reaches 23% of the number of all workers.

6. Attraction of foreign (international) students to HEIs of Ukraine

The training of foreign students is a significant article in the income of Ukrainian HEIs. Each foreign student pays an average $ 2 thousand on training and up to $ 6 thousand on living per year. Thus, foreign students pour into the Ukrainian economy more than $ 500 million a year (about 13 billion UAH). Public funding for higher education in Ukraine is about 16 billion UAH, which is comparable. Before the war, at the beginning of the 2013/14 academic year, almost 70 thousand foreign students or 4.1% of the total number of students (1.724 million) started training in Ukrainian HEIs (Forbes, 2015b). Students from Donetsk and Lugansk HEIs were able to complete the 2013/14 academic year in other cities. The management of Ukrainian HEIs, in which foreign students were trained, arranged meetings with the parents of students in order to convince them, the training in territories under Ukraine’s control is safe. But still some of the foreign students decided to continue their studies in other countries. And in 2013/14 academic year, instead of the expected 70–73 thousand, about 63 thousand came to Ukrainian HEIs (Mediaport, 2015). The dynamics of changes in the number of foreign students in Ukraine in recent years is shown in Fig. 2 (USCIE, 2016).

As you can see, before the revolution and the war there was a steady increase in the number of foreign students in Ukraine. Probably, this was due to the successful efforts of management of HEIs to attract foreign students to study (Onishchenko, 2015; Marope et al., 2015). The maximum (about 70 thousand foreign students) was achieved in 2014. With such indicators, Ukraine was in the TOP-20 countries in terms of the number of foreign students. After the beginning of the war, the number of students decreased and stabilized at a figure of about 64 thousand. Thus, as a result of the occupation of the Crimea and the war

Table 5

| HEIs                              | Type of scholarship | The size of the scholarship |
|-----------------------------------|--------------------|-----------------------------|
|                                   |                    | UAH | USD |
| University, academy, institute    | Academic enlarged  | 1600| 62  |
|                                   | Academic           | 1100| 42  |
|                                   | Social             | 1000| 38  |
|                                   | Social for orphans | 2000| 77  |
|                                   | For students of “difficult” and ‘scarce’ specialties | 2036| 78  |
| College, vocational professional school | Academic enlarged  | 1208| 46  |
|                                   | Academic           | 830 | 32  |
|                                   | Social             | 750 | 29  |
|                                   | Social for orphans | 2000| 77  |
|                                   | For students of “difficult” and ‘scarce’ specialties | 1536| 59  |
| Technical secondary schools       | Academic enlarged  | 1208| 46  |
|                                   | Academic           | 415 | 16  |
|                                   | Social             | 377 | 15  |
|                                   | Social for orphans | 1000| 38  |

* At the rate on August 1, 2017, 1 USD = 26 UHR, rounded to integers.
in the Donbass, Ukrainian HEIs lost about 6 thousand foreign students. By the end of the 2016/17 school year, this loss was not compensated.

In the territories of DPR and LPR there are practically no foreign students, since other countries do not recognize the diplomas of the self-proclaimed republics and there is a risk of suffering from military operations. And although some of the foreign students from the DPR and LPR moved to study in the territory controlled by Ukraine, but some went abroad. In the territory controlled by Ukraine, foreign students were distributed to various HEIs. Therefore, in 2015/16 academic year, there was an increase in the number of HEIs, in which foreign students were trained: from 185 to 228 in the 2016/17 academic year (USCIE, 2017).

Ukraine is constantly making efforts to prove that it is safe to live and study foreign students in the territories under its control (Marope et al., 2015; Onishchenko, 2015). Stabilization of the number of foreign students in 2014/15–2016/17 academic years proves that these efforts were justified. But even before the war Ukraine completely did not use its potential to attract foreign students to universities (Marope et al., 2015; Osipian, 2015a). There are such reasons:

1) low flexibility of training programs, the use of obsolete programs;
2) slow integration of Ukraine into the European scientific and educational space and failed structural reforms (EC, 2018);
3) obsolete educational material and technical base of universities;
4) poor knowledge of the teaching staff of English and other European languages (Forbes, 2013a);
5) corruption in higher education institutions and law enforcement agencies (in the police) (OECD, 2017; Osipian, 2015b);
6) low ratings of Ukrainian universities (THE, 2017; QS, 2017);
7) high prices of educational services, excluding prices for medical education (Osipian, 2015a);
8) poor conditions for students living in hostels (BOI, 2018).

In the past four years, these factors have been supplemented by war, a decline in social standards and the growth of crime. Chronic underfunding of education, “brain drain”, inefficient reforms allow many researchers (Marope et al., 2015; Osipian, 2015a; OECD, 2017) to assume that foreign students will leave for European countries and Russia, and the education system will continue to degrade.

Ukraine loses not only foreign students. Many Ukrainians go abroad to study (Domokha, 2015; Anticor, 2016; RIA News Ukraine, 2018), and the number grows every year: in 2014, 38 thousand Ukrainian students left for study abroad, in 2015–40 thousand, in 2016–50 thousand (Bogolih, 2017), in 2017–70 thousand (Gazeta.ua, 2017), half of them chose Poland (Rebisz and Sikora, 2015). The best people move away: only the best is able to leave, adapt and stay in a foreign country. This applies to students, and teachers, and scientists (Forbes, 2013b). They are looking for not only for better education, but for a higher standard of living (RIA News Ukraine, 2018). This “brain drain” reduces the chances of Ukraine to get out of the crisis.

And yet some countries have a stable interest in educational services of Ukraine (UCCG, 2018). Often political motives. For example:

1) students from Russia come to study in Ukraine without a visa, get a visa and go to other countries it is difficult;
2) students from Turkmenistan receive additional assistance in the process of admission and training, as Ukraine buys gas from Turkmenistan.

In 2016/17 academic year, 38.7% of foreign students were from post-Soviet countries (Azerbaijan, Turkmenistan, Uzbekistan). These students usually speak Russian, which facilitates their education in Ukraine. The next group consists of students from Asia and Africa — from Egypt, Jordan, China, India, Nigeria, Morocco, etc. The countries from which the most students come to Ukraine are shown in Table 6 (USCIE, 2017). There are practically no students from Western Europe and the USA in Ukraine. This is due to both a low level of education and insufficient adaptation to the Bologna model (EC, 2018).

The most popular cities for foreign students are Kharkov, Kiev and Odessa. Other most popular cities are listed in Table 7 (USCIE, 2016).

Currently, among the foreign students the most popular are the medical HEIs of Ukraine. They are most competitive with European HEI in terms of the price/quality ratio of the offered educational services. Also in the TOP of Ukrainian HEIs, which accept foreign students for training, there are a lot of humanitarian educational institutions (primarily economic ones). But there are no technical HEIs among the leaders of the Ukrainian ranking, which is demonstrated by the Table 8. There are opinions (Talanova et al., 2017; Marope et al., 2015) that this does not reflect the real state of the level of training of technical specialists, and in many respects is a consequence of the imperfection of the method of evaluation.

**Table 6**

| Countries of origin | Amount of students, persons |
|--------------------|-----------------------------|
| 1. Azerbaijan       | 9,316                       |
| 2. India            | 7,746                       |
| 3. Turkmenistan     | 6,545                       |
| 4. Morocco          | 4,602                       |
| 5. Georgia          | 3,596                       |
| 6. Nigeria          | 3,429                       |
| 7. Jordan           | 2,461                       |
| 8. Uzbekistan       | 2,202                       |
| 9. China            | 2,082                       |
| 10. Egypt           | 1,955                       |

Fig. 2. Number of International Students in Ukraine (2011/12–2016/17).

*Data on January 1 of each academic year, which corresponds to the middle of the academic year. So, for example, in Ukraine for the last 2 years studied: - (01.01.2016) 63,906 international students from 148 countries (USCIE, 2016); - (01.01.2017) 64,066 international students from 147 countries (USCIE, 2017).
The interest of foreign students to Ukraine is no longer not only due to the low quality of education, the war in the Donbass and high corruption (Osipian, 2009). Interethnic conflicts also play a negative role in territories where there is no occupation and fighting, such as the pogrom in the Kharkov campus on June 12, 2015. Such cases are rare, but they create a great resonance in the media. Although much more foreign students have suffered in recent years simply because of the increase in the number of crimes for money-oriented, not ethnic, motives (Today, 2016; BOI, 2018). The increase in the number of crimes exacerbates the low professionalism of the police, and is associated with the impoverishment of the population and illegal trafficking in weapons due to hostilities. Criminal incidents bring Ukraine not only reputational, but also economic losses, measured in billions of hryvnia (Mediaport, 2015).

In order for Ukraine to become more attractive in the world market of educational services, it is important to improve the quality of higher education, which is assessed using the ratings of the magazine "Times Higher Education" (further - THE) and "Quacquarelli Symonds" (further - QS) (THE, 2017; QS, 2017), cooperation between universities and business, innovations. While Ukraine is represented in these ratings by a small number of universities and has low rates. Progress of Ukraine to improve the ratings over the past few years is also insignificant. So, in the rating of THE until 2016 Ukraine was not represented. In 2016, there were 2 universities in the ranking, and in 2017 – 4 universities. In the QS rating in 2016, Ukraine ranked 46 out of 50 possible (Word and Action, 2017a), and was presented by 6 universities. According to the Center for Development of Corporate and Social Responsibility, Ukraine ranks 74th in terms of cooperation between universities and business in research and development, 29th in terms of the number of scientists and engineers. And in the rating of innovative countries Bloomberg for 2015, Ukraine ranks 33rd (Forbes, 2015b).

Improvement of these ratings will allow to invite more foreign students to study, help Ukrainian HEI to earn more money for themselves and the Ukrainian budget, improve the material and technical base, increase salaries for teachers and invite top foreign specialists to work as teachers (Yusyk et al., 2018).

### 7. Suggestions for improving the system of education and knowledge control in the system of higher engineering education

Both students and teachers of Ukrainian HEIs long used the modular-rating system of education, and have become accustomed to it (Turkot, 2011). But often the content of training modules is poorly interrelated. One module is not a logical extension of the other. This creates a feel of fragmentariness in training and reduces the interest in the learning process. Therefore, many training modules should be amended, and the system for making such changes should become more flexible (Sok, 2017). A competence approach should also be applied systematically in curriculum design (Khatko, 2013; Proshkin, 2017; Tsvirkun, 2017; Chemeris, 2018).

As an obligatory educational mechanism, the modular rating system has been abolished by the MES of Ukraine, but now the use of the European Credit Transfer and Accumulation System is mandatory (CMU, 2014; Osvita.ua, 2014). This moment in the reform of Ukraine’s education is an excellent opportunity to make correct accents in the formation of educational information blocks, their interrelations and evaluations (Fedorenko, 2016).

Evaluation of students training in the framework of standardized education should be based not on the duration or content of training, but on the knowledge and skills that graduates have acquired (Khatko, 2013). At the same time, the HEIs should monitor the content of blocks of students’ knowledge and skills for relevance (demand outside the HEI) and the feasibility of obtaining knowledge on the terms. HEIs should also be prepared to enter into a system of continuous (DiSilvestro, 2013), lifelong education (Life Long Learning), which meets the needs of modern society, the market and manufacturing enterprises (Yang et al., 2015).

In the process of preparing students, it is advisable to introduce tests of control and self-control after each block of information studied (Talanova et al., 2017). Such a test can be compiled for each academic hour devoted to the study of theoretical information, for each subject covered by one training course, for each subject and for each group of subjects related there is already such a practice, borrowed from the American practice of medical training (UMC, 2013). The system facilitates the assimilation of a large amount of information, breaking it into 3 large parts — basic, general clinical and clinical special. By analogy, we propose to divide the course of teaching into 3 levels. On the example of the specialization “Electric machines and apparatuses”, Table 9 shows the interrelation of the study subjects and the issues studied at all

### Table 7

| City | Number of foreign students, persons |
|------|-----------------------------------|
| 1. Kharkiv | 20,925 |
| 2. Kyiv | 12,950 |
| 3. Odessa | 6,972 |
| 4. Dnipr | 3,046 |
| 5. Zaporizhzhya | 2,325 |
| 6. Ternopil | 2,317 |
| 7. Vinnitsa | 2,284 |
| 8. Ivano-Frankivsk | 2,282 |
| 9. Poltava | 1,787 |
| 10. Lviv | 1783 |

* Transliteration of city names is made from Ukrainian spelling.

### Table 8

| University | Year 2015-2016 (USCIE, 2016) | Year 2016-2017 (USCIE, 2017) |
|------------|-------------------------------|-------------------------------|
| Place in TOP | Amount of students | Place in TOP | Amount of students |
| V. N. Karazin Kharkiv National University | 1 | 4528 | 2 | 4199 |
| Kharkiv National Medical University | 2 | 3565 | 1 | 4600 |
| Odessa National Medical University | 3 | 2652 | 5 | 2249 |
| Simon Kuznets Kharkiv National University of Economics | 4 | 2025 | |
| National Pirogov Memorial Medical University | 5 | 2094 | 6 | 2017 |
| Zaporizhzhya State Medical University | 6 | 1977 | 4 | 2275 |
| Ivano-Frankivsk State Medical University | 7 | 1641 | |
| National University of Pharmacy | 8 | 1610 | 9 | 1563 |
| Bogomolets National Medical University | 9 | 1588 | 7 | 1902 |
| I. Horbachevsky Ternopil State Medical University | 10 | 1520 | 3 | 3036 |
| Interregional Academy of Personnel Management | | | 8 | 1679 |
| European University | | | 10 | 1556 |
| Dnipropetrovsk Medical Academy of Health Ministry of Ukraine | | | | |

...
Table 9
Examples of educational disciplines and questions from the three training blocks that are related to each other, which can be used to train a student in the specialization of ‘Electrical Machines and Apparatuses’.

| Step | Educational discipline, subject | Subject or question under study |
|------|--------------------------------|-------------------------------|
| 1.   | General technical disciplines  | The law of electromagnetic induction. Laws of Ohm and Kirchhoff |
|      | Physics                        | Integral and differential calculus. Fourier series. Matrices |
|      | Higher Mathematics             | The method of reduced stresses for a beam on two supports. Plans of speeds and accelerations for calculation of a two-element system |
|      | Applied mechanics              | Calculation of the magnetic fields of the turbogenerator stator by of the finite element method |
| 2.   | Specialty Disciplines          | The rotor designs of asynchronous machines. Problems of starting asynchronous motors |
|      | Electric machines              | Linear electric circuits with sources of constant voltage and current |
|      | Theoretical Foundations of Electrical Engineering | Rectifiers, inverters and frequency converters for electromechanical devices |
|      | Industrial Electronics         | A systematic approach to the assessment of the technical condition of electrical equipment in Ukrainian power systems. Asychronized turbogenerators. Schemes of switching on of the field windings |
| 3.   | Educational disciplines at the student's choice | Preparation of electrical machines to the repair. Disassembly of electrical machines. Repair and maintenance of electric motors 0.4kV |
|      | Prospects for improving modern turbogenerators | |
|      | Service maintenance of electromechanical systems | |

three levels. It is important to note that in this sequence the topics that are included in all training courses are used (NTU ‘KPI’, 2017), but the connection between them is not clearly outlined, it is not clear for students (Jørgensen, 2006).

According to this scheme, you can start studying the next stage only after successfully passing the tests on the previous one (EHEA, 2015). When studying the course, an exhaustive list of tests should be given to help students pass the exam. Tests published on the websites offering their HEIs should not be changed until the end of each current academic year, until the end of the last exam using these tests this year (Polezhaev et al., 2017). The tests themselves should not have controversial answers: of all the proposed answers, there should be only one correct and obvious for the person who studied the course (Gutkevich and Onischenko, 2014). Protection from the mechanical memorization of the correct answers should be the large volume of material covered by the tests. Thus, only those who understand the contents of the training course will be able to give correct answers (Polezhaev et al., 2017).

Variants of incorrect responses to tests can be both completely unrelated to the subject data, and typical for students errors on this topic. On the sites of HEIs, tests should be available at any time for self-monitoring of students in preparation (Zelinsky, 2016). In the ‘work on bugs’ mode, the correct answers should be explained with links to the training materials.

Teachers working on the preparation of tests should be counted the hours of the load according to the legal standard for the performance of the training load. It is advisable to include these hours in the volume of the ‘second half of the day’ load (Tovazhnyansky, 2012). Similarly, the time for self-control in the hours of independent work of students should be included.

Improving the systems of control and self-control will lead to an increase in the attractiveness of Ukrainian education in the world educational market, as:

1) if the results of self-control are consistent with the results of the teaching control, the trust in the teaching system compromised by corruption scandals of recent years (Kondratova, 2017);
2) allow students to compare the content of Ukrainian curricula with similar curricula in other HEIs in Europe.

In addition, you need to pay more attention to the comfort of learning (Onischenko, 2015; Dakowska, 2017):

1) increase the number of computer and presentation equipment, interactive training courses with the self-control tests described, the educational equipment of classrooms and laboratories;
2) to increase the security for foreign students living in the cities of Ukraine by police forces and private security of HEIs;
3) accelerate the process of digitization of library funds of HEIs.

HEIs administrations need to find funds (for example, money from potential employers) so that teachers and students can conduct independent research and publish their results in the Scopus lists and other international citation systems (Skok, 2017). In practice, independent payment of publications in periodical scientific publications to Ukrainian scientists and teachers is often too expensive (Samokhin, 2016).

It would also be rational to create jobs for students at universities to give them the opportunity to formally earn and cover part of the cost of their education.

The task for Ukraine is not only to integrate the national educational system into the European educational space, but also to reduce the difference between the educational systems of different regions (the quality of educational services, the correspondence between the specialization of educational institutions and the needs of the labor market).

8. Conclusions

1 The revolution (2013) and the war with Russia (2014-present) forced the Ukrainian government and parliament to launch significant social reforms, and Ukrainian society to demand from the government the results of these reforms. One of the ongoing social reforms is the reform of the education system. In particular, the system of higher education.

2 Ukraine has been a participant in the Bologna process since 2005, but only in 2014 the formal process of Bologna standardization of scientific and qualification degrees was completed. This is done by amending the basic law of Ukraine “About higher education”. The reform is carried out inconsistently, slowly, there is no clear strategic plan and roadmap for reform. The responsibility for this lies primarily on MES.

3 Ukrainian HEIs should work purposefully to improve the ratings of THE, Quacquarelli Symonds, the Rating of cooperation between HEIs and business in the field of research and development, etc., which will serve as indicators of the education reform.

4 In fact, there is no HEI's autonomy in financial matters in Ukraine, which is why educational institutions do not have enough money or motivation to flexibly and quickly rebuild their training programs, depending on the changing needs of society and business. To provide full HEI's autonomy the MES must to abandon the rigid administration of the educational process and the distribution of finances by expenditure items, to leave the earned money at the disposal of educational institutions.
5 Ukrainian HEIs require significant improvement of their pecuniary and technical resources. This should be facilitated by an increase in state funding for education and science, providing opportunities for Ukrainian and foreign students to work while studying for a profession, earning money for their education. Also, HEIs should be able to provide paid research services to business and the state, and to attract funds from local communities.

6 Raising salaries for teachers of HEIs will help restore the prestige of the profession of the teacher and reduce the outflow of scientists and teachers abroad. The work on the rapid change of curriculum content should be included in the training load and paid for. Also conditions should be created for intensive study of English and other European languages by teachers.

7 The consolidation and enlargement of HEIs through their merger should take place in the most conflict-free mode, with broad discussion among teachers, students, their parents and representatives of local communities where HEIs are situated.

8 Ukraine at the state level should introduce the practice of partial compensation of credits for higher education, or reduce lending rates by issuing loans for the education of Ukrainian students through state banks. To pay for educational services, Ukrainian HEIs also need to work more closely with employers, for executing their educational order.

9 It is necessary to revise the mechanism for calculating scholarships for students of budgetary form of education, which do not have academic debt. The amount of scholarships should not be lower than the officially established subsistence level. The MES should abandon the practice of setting quotas for assessments "excellent", which affects the accrual of enlarged academic scholarships.

10 An important source of income for both Ukraine and Ukrainian HEIs is the training of foreign students. Ukraine does not use all its potential to attract more foreign students, as there is a hybrid war with RF, part of the educational institutions remained in the occupied territories, the criminal situation worsened, there is a high level of corruption, the education system reform in the Bologna program is slow, monetary and technical resources of educational institutions requires significant updating.

11 When working on new curricula and standards of higher engineering education, training modules should be divided into three consecutive stages (general technical disciplines, disciplines of specialization and discipline at the student's choice), which will increase the visibility of the interconnection of academic disciplines and improve the understanding of subjects. Each topic of the curriculum should be provided with an exhaustive list of test questions, which will facilitate both self-control and teaching control. The content of the training modules should correspond to the needs of potential employers of students, and the system for making changes to curricula should be more flexible and operational.

Acknowledgments

I express my gratitude to my son Alexander S. Shevchenko for ideas in improving the system of training and knowledge control, and for help in translating into English.

References

112.ua, 2016. Ukraine’s state budget 2017: the key figures. News Agency ‘112.ua’. https://112international.com/article/ukraines-state-budget-2017-the-key-figures-12315.html.

Surshik, L., Onischenko, O., 2013. ‘Not finished/not legal’ education. Three bills on higher education: the main accents and differences (Ukr.). Analytical portal ‘2N.UA’. https://2n.ua/EDUCATION/rezakonochrome-ovitva.html.

Repko, M., Rada, Y., 2017. Ukrainian-style education: 129 billions Hryvnya—a waste or an investment in the next generation? (Ukr.). Analytical Portal ‘VoxUkraine’.

https://voxukraine.org/en/ovitva-po-ukrayinski-en.

Frankfurter Allgemeine, 2015. Security Cops: Up to 50,000 dead (Ger.). Frankfurter Allgemeine. http://www.faz.net/aktuell/politik/ausland/ukraine-sicherheitskreise-bis-zu-50-000-tote-1341612.html.

Antic, Đ., 2016. The collapse of education in Ukraine: bad news for school and university teachers (Rus.). National Anti-Corruption Portal Anticor. http://antikor.com.ua/articles/89453-kollaps-obrazovannija_vukraine-plohit_novosti_dliga_uchitelei_i_oproprovoditeli.

ASN, 2014. Boeing 777-2H6ER (ASN). Criminal occurrence description. Aviation Safety Network (ASN). https://aviation-safety.net/database/record.php?id=20140717-0.

Bachmann, S.-D.O.V., 2014. Malaysia airlines flight MH17: the day Russia became a state sponsor of terrorism. Amic. Curiae 95, 1–3. https://doi.org/10.2139/sunm.248713, 2014.

Bakhrushin, V., 2016. Financing of Ukrainian education: some thoughts on the results of the Parliamentary hearings. Educational policy. Portal of public experts. http://education.ua.ua/articles/841-finansuvannya-ukrajinskoji-ovitvy-deyski-dumki-z-rezultatami-parlamentskih-sluhan.

Bakirov, 2018. Interview of Bakirov, V.S., Rector of Kharkov National University named after V.N. Karazin, Chairman of the Council of Rectors of Kharkiv Universities. TV program “Comments” on the Kharkov television channel P1, broadcast May 26, 2018. https://yousee.by/IFPM0B&ASD.

Bbc.com, 2015. MH17 crash: Russia vetoes UN resolution for international tribunal. News portal bbc.com July 29, 2015. https://www.bbc.com/news/world-europe-33716088.

Bentzen, N., 2015. Ukraine’s economic challenges. From ailing to failing. European Parliamentary Research Servicehttps://doi.org/10.2861/49917. 32 p.

Bogolob, T.M., 2017. Budget for citizens as a priority of state budget policy. Persyaslav-Khmelnytsky GPU named after Bohdan Skovoroda, vol. 33/1. Economic Herald of the Ukraine, pp. 274–284. https://zbov.gov.ua/URN/evcu_2017_33#281%29_35.

BOI, 2018. What are the difficulties encountered by foreign students (Interview with Usov, S., Chairman of the Kharkiv Foreign Students’ Trade Union). News portal ‘Boiling over inside’ (BOI). https://nakipeo.ua/s-kakimi-trudnostami-stavkayut-yu-shkolnye-studenty, 2018.

Bologna’s Reports of Ukraine, 2012. National Reports regarding the Bologna Process implementation. 2005, 2007, 2009, 2012. http://www.eheis.edu/thid4250- cid101611/ukraine.html.

Budapest Memorandum, 1994. Memorandum on Security Assurances in connection with Ukraine’s accession to the Treaty on the Non-Proliferation of Nuclear Weapons. Budapest. December 5, 1994. http://www.parcener.org/content/medicine/files/12/13943175580.pdf.

Bulatova, O.V., 2012. Regional component of global integration processes: Monograph. DonNU. https://91.250.23.195:8080/jspui/bitstream/123456789/432/1/regionálna_składowa.pdf.

Business.ua, 2015. The new draft law on education will not finance HEI through state order (Rus.). Analytical portal “Business.ua”. https://www.business.ua/social-policies/kvitr-osnovnoj-obrazovani-finansuvannya-yu-vuzov-uchenych-grozaks-224743,

Chemeris, A., 2018. Concept of global competence of the future bachelor of computer sciences in native and foreign studies. Youth Market 5 (160), 129–133. doi:10.12491/2308-4634.2018.139023.

Chemeris, A., 2017. Ukrainian science: a century of stagnation (Rus.). UNIAN. https://www.unian.net/science/129–281.html, 2017.

CMU, 2014. Ministry of Education and Science of Ukraine to abolish the obligatory credit-module system (Ukr.). Cabinet of Ministers of Ukraine September 24, 2014. https://www.kmu.gov.ua/news/24762078.

CMU, 2015. Decree No. 216 “About Amendments to the Decree of the Cabinet of Ministers of Ukraine, August 22, 1996, No. 992” (Ukr.). Cabinet of Ministers of Ukraine April 15, 2015. https://www.kmu.gov.ua/control/uk/cardnpd/docid=24813946.

CMU, 2016. The order of approvement and payment of scholarships (Ukr.). Cabinet of Ministers of Ukraine (CMU) Approved by the decision of July 12, 2004, No. 882, amended by the Decree of December 28, 2016, No. 1050, current. http://zakon2.rada.gov.ua/laws/show/882-2004-%D0%9F%F/par1#nt7.

CMU, 2018a. Reforms in Ukraine: progress and priorities. 68 p., Foreword by the Prime Minister Groisman, V.; Reform Priorities Progress at a Glance. https://www.kmu.gov.ua/storage/app/media/reform%20office/Ukraine_Reform_Conference_I_web.pdf.

CMU, 2018b. Reforms in Ukraine: Progress and Priorities. Education Reform 16–19. https://www.kmu.gov.ua/storage/app/media/reform%20office/Ukraine_Reform_Conference_I_web.pdf.

Congress of USA, 2017. An Act ‘To provide congressional review and to counter aggression by the Governments of Iran, the Russian Federation, and North Korea, and for other purposes’. Law of USA H.R. 3364, August 2, 2017. 70 p., Congress of USA. https://www.treasury.gov/resource-center/sanctions/Documents/hr3364_pl115-44.pdf.

Correspondent, 2014. The General Prosecutor’s Office declared the DPR and LPR as terrorist organizations (Rus.). Correspondent. http://korrespondent.net.ukraine/politics/3364221-hemprovokatamuraibiaz-dny-z-rk-terorirnyhshchynshky-

Correspondent, 2016. Successes are zero. Corruption after the Maidan (Rus.). Correspondent. http://korrespondent.net.ukraine/politics/3775556-korrupciya-v-ukrayine-vymižnennj-tyt-sohlasny.

Correspondent, 2018. What specialties have received most of the state procurement seats (Rus.). Correspondent. http://n-r.od.ua/vnz/consultations/61397.

Council of Europe, 1997. Convention on the Recognition of Qualifications concerning Higher Education in the European Region. Council of Europe, Lisbon April 11, 1997. http://www.coe.int/en/web/conventions/full-list/-/conventions/rms/}

1 All links accessed: 2 August 2018.
Word and Action, 2017b. The system of accrual of scholarships-2017: the basic criteria. (Rus.). Analytical portal “Word and Action”. https://ru.slovoidilo.ua/2017/02/15/inforgrafika/obshhestvo/sistema-nachisleniya-stipendij-2017-osnovnye-kriterii.

Yang, J., et al., 2015. In: Yang, J., Schneller, C., Roche, S. (Eds.), The Role of Higher Education in Promoting Lifelong Learning. UNESCO Institute for Lifelong Learning May, 199 p. https://www.researchgate.net/publication/31649293_The_Role_of_Higher_Education_in_Promoting_Lifelong_Learning.

Yusiuk, O., Maslova, Y., Zukow, W., 2018. Rating positioning as part of Polish and Ukrainian Universities comparative aspect. J. Educ. Health Sport 8 (5), 149–159. https://doi.org/10.5281/zenodo.1245945.

Zakharin, S.V., Denysenko, M.P., 2014. Financing of higher education development in Ukraine: problems and prospects. Actual Probl. Econ. Law 9 (159), 113–119.

Zelinsky, S.S., 2016. Formation of informative competence of future engineers in the process of professional training. Dissertation of the candidate of pedagogical sciences on the specialty "Theory and method of vocational education" (13.00.04), on the rights of the manuscript. Kryvyi Rih, 257 p. http://luguiv.edu.ua/wp-content/uploads/2016/06/zelinsky_dis.pdf.

Zubchenko, Y., 2016. Bologna system 'in Ukrainian': mimicry, laziness and outright manipulation (Ukr.). Analytical portal «MediaSapiens». http://ms.detector.media/mediaprosvita/education/bolonska_sistema_poukrainski_mimikriya_lin_ta_yidverta_manipulyatsiya.