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Applying digital technologies for work management of young scientists' councils

Anna V. Iatsyshyn[1], *Iryna H.* Hubeladze[2], *Valeriia O.* Kovach[1,3,4], *Valentyna V.* Kovalenko[1,5], *Volodymyr O.* Artemchuk[1,6], *Maryna S.* Dvornyk[2], *Oleksandr O.* Popov[1,4,6], *Andrii V.* Iatsyshyn[1,6] and *Arnold E.* Kiv[7]

[1]*State Institution "The Institute of Environmental Geochemistry of National Academy of Sciences of Ukraine", 34a Palladin Ave., Kyiv, 03680, Ukraine*

[2]*Institute for Social and Political Psychology of the National Academy of Educational Sciences of Ukraine, 15 Andriivska Str., Kyiv, 04070, Ukraine*

[3]*National Aviation University, 1 Liubomyra Huzara Ave., Kyiv, 03058, Ukraine*

[4]*Interregional Academy of Personnel Management, 2 Frometivska Str., Kyiv, 03039, Ukraine*

[5]*Institute of Information Technologies and Learning Tools of NAES of Ukraine, 9 M. Berlynskoho Str., Kyiv, 04060, Ukraine*

[6]*G.E. Pukhov Institute for Modelling in Energy Engineering of NAS of Ukraine, 15 General Naumova Str., Kyiv, 03164, Ukraine*

[7]*Ben-Gurion University of the Negev, P.O.B. 653, Beer Sheva, 8410501, Israel*

Abstract. The publication explores the features of the digital technologies' usage to organize the work of the Young Scientists' Councils and describes the best practices. The digital transformation of society and the quarantine restrictions caused by the COVID-19 pandemic have forced the use of various digital technologies for scientific communication, the organization of work for youth associations, and the training of students and Ph.D. students. An important role in increasing the prestige of scientific activity and encouraging talented young people to participate in scientific projects belongs to the Young Scientists' Councils, which are created at scientific institutions and higher education institutions. It is determined that the peculiarities of the work of Young Scientists' Councils are in providing conditions for further staff development of the institution in which they operate; contribution to the social, psychological and material support of young scientists and Ph.D. students; creating an environment for teamwork and collaborative partnership; development of leadership and organizational qualities; contribution to the development of digital competence. The advantages of using electronic social networks in higher education and research institutions are analyzed, namely: general popularity and free of charge; prompt exchange of messages and multimedia data; user-friendly interface; availability of event planning functions, sending invitations, setting reminders; support of synchronous and asynchronous communication between network participants; possibility of access from various devices; a powerful tool for organizing the learning process; possibility of organization and work of closed and open groups; advertising of various events, etc. Peculiarities of managing the activity of the Young Scientists' Council with the use of digital technologies are determined. The Young Scientists' Council is a social system, and therefore the management of this system refers to social management. The effectiveness of the digital technologies' usage to manage the activities of the Young Scientists' Council depends on the intensity and need for their use to implement organizational, presentation functions and to ensure constant communication. The areas to apply digital technologies for the work managing of Young Scientists' Councils are sorted as the presentation of activity; distribution of various information for young scientists; conducting questionnaires, surveys; organization and holding of scientific mass events; managing of thematic workgroups, holding of work meetings. It is generalized and described the experience of electronic social networks usage for organizing and conducting of scientific mass events.

Keywords: digital technologies, young scientists, Ph.D. students, doctoral students, electronic social networks, information support, management, scientific work

1. The statement of the problem

Currently, countries with developed economies pay special attention to the promotion of science and the active involvement of young people in promising research conducting. An important role in this process belongs to youth associations, and in particular to the Young Scientists' Councils. Youth activities within the Young Scientists' Councils are a way to hear the voice of young scientists in higher education, research institutions, both nationally and internationally. The establishment of Young Scientists' Councils provides not only the conditions for further staff development of the institution in which such a Council operates, but also contributes to the social, psychological, and material support of young scientists and Ph.D. students.

For the scientific youth of Ukraine, the creation and operation of the Young Scientists' Councils have become a platform for uniting efforts and cohesive cooperation based on partnership, not competition. Such interaction forms a desire not just to follow the leader, but to be cooperative and have the opportunity to become a leader oneself. A young scientist is not only an age category. This is an important stage in the formation of a scientist when there are more questions than answers. And at this stage, it is important to support more experienced colleagues, but not from the authoritarianism or dominance standpoint, but from the standpoint of partnership, to guide the young scientist not only to improve what already exists but to find non-standard solutions, create a unique product [17].

We agree with what is stated in [46], that the functioning of the Young Scientists' Council is extremely important in the context of the European Higher Education and Research Area building, which will allow Ukrainian young scientists to be at the epicenter of European information space, to represent and lobby the interests of scientific youth in the European space and to promote contacts with national associations of young scientists and other academic partners of different countries.

The modern period of social development is characterized by the digitalization of all spheres of life: from politics and government to education and science [9, 34, 35, 58]. The general availability and dissemination of digital technologies as an integral part of digital society contributes to the renewal of work functions, simplifies the processes of interaction and experience exchange between people [19]. Also, the development of digital competence is important, especially for researchers and lecturers [39, 41, 42, 45]. Because researchers conduct research that must be performed following current scientific trends and be presented to the general public in an accessible form. And lecturers in higher education institutions should ensure the implementation of modern scientific findings in the educational process, being responsible for the training of future professionals of the new technological era. And applying digital technologies, particularly electronic social networks, is convenient and free of charge to develop the specialists' digital competence in various fields [21, 22].

anna13.00.10@gmail.com (A. V. Iatsyshyn)
0000-0001-8011-5956 (A. V. Iatsyshyn); 0000-0001-8023-6408 (I. H. Hubeladze); 0000-0002-1014-8979 (V. O. Kovach); 0000-0002-4681-5606 (V. V. Kovalenko); 0000-0001-8819-4564 (V. O. Artemchuk); 0000-0003-1505-0169 (M. S. Dvornyk); 0000-0002-5065-3822 (O. O. Popov); 0000-0001-5508-7017 (A. V. Iatsyshyn); 0000-0002-0991-2343 (A. E. Kiv)

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According to scientists, electronic social networks are experiencing not only the peak of popularity but also the stage of rapid development. The main factors of the attractiveness of social networks for users are free registration, popularity, the ability to choose the language of the site, free services, the ability to create your own content, posting photos, videos, chat functions, the ability to create closed and open groups, etc. Electronic social networks are more and more often used by various organizations and enterprises to present activities and interact with consumers.

As digital technologies allow integrating different forms of information presentation, as well as combining methods of communication and interaction, we consider them an important tool for organizing the activities of Young Scientists' Councils and promoting science among the general public.

Information on the activities of youth associations in the scientific and educational spheres, in particular on the work of the Young Scientists' Councils, is presented mainly on the official websites of various institutions, and there are only a few cases of scientific publications related to this issue. Various aspects of the use of digital technologies in higher education and research institutions are described in [16, 21–23, 26, 28, 29, 38, 40, 50, 55–57, 62]. After analyzing scientific publications and Internet sources on the electronic social networks' usage for various fields of knowledge, these publications were systematized in the following areas [1, 3–5, 8, 12, 14, 15, 18, 20, 24, 25, 30, 31, 36, 43, 52–54, 59, 60, 63]: the implementation of electronic social networks in the work of educational institutions; to manage social systems; for information and analytical support of scientific research; for journalism; for sociology; for psychology, however, the usage of electronic social networks for information support of youth associations, in particular the Young Scientists' Councils, is considered insufficiently. We believe that it is important to analyze the features of the usage of digital technologies, particularly electronic social networks, to organize the work of the Young Scientists' Councils.

The goal of the article is to explore the features of digital technologies' usage to organize the work of the Young Scientists' Councils, and to describe the best practices.

2. Research results

2.1. Features of the Young Scientists' Councils work

An important aspect for the training of future doctors of philosophy and the becoming of young scientists is the activities of various youth associations, namely: Scientific societies of students, Ph.D. students, doctoral students, and young scientists; Young Scientists' Councils; Public youth organizations, associations.

Let's analyze the features of the *Young Scientists' Councils* functioning, which are formed in higher education institutions, research institutions, and regional state administrations. The main purpose of the Young Scientists' Council is to promote the rights of young scientists, to ensure their active participation in research, and to protect their interests.

Let's take a look at the activities of the **Young Scientists' Council at the Ministry of Education and Science of Ukraine** and its impact on the formation of youth policy in the field of education and science of Ukraine. The Young Scientists' Council at the Ministry of Education and Science of Ukraine is an advisory body established to promote the constitutional

rights of young scientists to participate in the formation and implementation of state policy in the field of science, science-technology, and innovation activities. Since 2014, the Council is the legal successor of the Young Scientists' Council at the State Agency for Science, Innovation, and Informatization of Ukraine [46]. In figure 1 it is provided information about the Young Scientists Council at the Ministry of Education and Science of Ukraine at the official website of the Ministry.

Figure 1: Website information about the Young Scientists' Council at the Ministry of Education and Science of Ukraine.

The main tasks of the Young Scientists' Council at the Ministry of Education and Science of Ukraine are:

- promoting the cooperation between the Ministry of Education and Science of Ukraine and self-governing scientific youth organizations of research and higher education institutions of Ukraine;
- advisory support to young scientists in research activities, cooperation with foreign customers of scientific products, etc.;

- formation of proposals to create legal and socio-economic conditions for attracting talented youth to work in the scientific field, stimulating the professional activity of young scientists in local research and higher education institutions, raising their professional level, and realization of their creative and professional activity;
- assistance in attracting young scientists to participate in competitions of scientific works, formation of young scientists' teams for implementation of perspective scientific projects [46].

On the Ministry of Education and Science of Ukraine website [46] it is described the main activities of the Young Scientists Council at the Ministry of Education and Science of Ukraine:

1. Advisory area – participation in the development of bills and regulations, appeals to the authorities with proposals; participation in parliamentary and committee hearings. During the functioning of the Council, it was prepared a number of proposals (draft amendments, reports, justifications, etc.) to the Laws of Ukraine and other regulations in the field of science and education.
2. Information and communication area – is aimed at communication between individuals and legal entities on the exchange of information (e-mailing, coverage of activities, and current opportunities for young scientists in social networks, etc.). In order to implement this, the following was created: an electronic newsletter with more than 4,000 subscribers – young scientists of Ukraine; Facebook page [47] with more than 6,000 followers, Instagram, Twitter; information groups in social messengers Viber, Telegram; YouTube channel; publications in the newspapers "Osvita Ukrainy", the journal "Vyshcha Shkola", the Eurodoc bulletin "Newsletter", the magazine "Nasha Perspektyva" and others.
3. The international area is aimed at representing the community of young scientists of Ukraine in the global environment (membership and cooperation with the European Council of Doctoral Candidates and Junior Researchers of Eurodoc and Milset Europe). Among the achievements and activities of the members of the Council of Young Scientists at the Ministry of Education and Science of Ukraine in Eurodoc there are the following: membership in Eurodoc working bodies (Board, Advisory Board, Administration); participation in Eurodoc working groups on employment and research careers, education policy research, interdisciplinary research, open access, and mobility; Plenary Meetings delegates and observers; translation into Ukrainian and promotion of the European Charter for Researchers and the Employment of Researchers' Code; participation in workshops at the Eurodoc Plenary Meeting on research integrity and training for new Eurodoc delegates; annual reports on the Conference and the Plenary Meeting, as well as participation in the Annual Questionnaire; editing the Eurodoc Newsletter bulletin; development and administration of a new Eurodoc website; participation in the development of European and Eurodoc documents; participation in the preparation of Open Science Ambassadors; participation in the European Commission Expert Group – Commission Expert Group in Graduate Tracking, Bologna Follow Up Group; participation in the development of the direction concerning academic diplomacy – presenting Ukraine for representatives of European national organizations of young scientists, dissemination of information about Ukraine; international experience usage to formulate proposals for regulations

and their argumentation for key stakeholders in Ukraine; informing the community on topical issues of science and higher education in Europe; development of documentation and the Code of Experts in the Call for Proposals of young scientists of the Ministry of Education and Science, based on the Code of Conduct for Experts of the European Research Council (ERC) and the European Charter for Researchers [46]. The activities of the Young Scientists' Council at the Ministry of Education and Science of Ukraine in are mentioned MILSET. MILSET is an international movement for leisure in science and technology, which is a non-governmental, non-profit, and politically independent youth organization that aims to develop a scientific culture among young people through scientific-technical programs, including exhibitions, congresses, and other events. Also, the Young Scientists' Council at the Ministry of Education and Science of Ukraine signed a declaration on cooperation with the Young Scientists' Council at the Ministry of Science and Higher Education of the Republic of Poland.

4. Organizational area – activities for the organization (co-organization) of events on different levels, namely: round tables, seminars, and webinars, conferences, International Youth Science Festival, international conferences, forums, projects, youth competitions, etc.

Also, the Young Scientists' Council at the Ministry of Education and Science of Ukraine participates in the work of competition commissions and workgroups in the field of science and education, namely [46]:

- it is organized and held a competition for the selection of experts among young scientists of higher education and research institutions of Ukraine to participate in the review of research projects submitted to competitions for funding from the state budget;
- the competition commission of the Competition of scientific projects for young scientists;
- the competition commission for awarding the Prize of the Verkhovna Rada of Ukraine to young scientists and nominal scholarships of the Verkhovna Rada of Ukraine for young scientists – doctors of sciences;
- the workgroup on the preparation of proposals for the development and improvement of the legal framework for the implementation of scientific and scientific-technical activities of the Ministry of Education and Science of Ukraine;
- the competition commission for the award of academic scholarships for students and cadets named after the Heroes of the Heavenly Hundred;
- the Head of the Young Scientists' Council at the Ministry of Education and Science is included in the Board of the Ministry of Education and Science of Ukraine.

We support the opinion stated in [11] that young scientists are a powerful intellectual force that builds the scientific future of the country, actively influencing the formation of the strategy of socio-economic and political development of the state. The Ministry of Education and Science of Ukraine actively supports young scientists in their efforts to unite for the active development of the youth scientific movement. The active work of the Young Scientists' Council at the Ministry of Education and Science of Ukraine confirms the effectiveness of constructive cooperation of young scientists with public authorities and public associations and the high

potential for interaction of representatives of various youth scientific associations. Based on the European vision and approaches to scientific career and scientific policy, the Young Scientists' Council at the Ministry of Education and Science will build and strengthen its expert advisory activities for all categories of national stakeholders and work for effective transformations in science and higher education in Ukraine.

Let's analyze in more detail the activities of the *Young Scientists' Council at the National Academy of Educational Sciences of Ukraine* (figure 2). The Young Scientists' Council at the National Academy of Educational Sciences of Ukraine (NAES of Ukraine) is a collegial elected advisory body of the NAES of Ukraine, which unites young scientists of subordinate scientific institutions of the NAES of Ukraine. The Young Scientists' Council of NAES of Ukraine was established in 2016. The activities of the Council are carried out on a voluntary basis and are based on the following principles: scientific ethics; freedom of scientific creativity; equality of all its members; publicity and openness in work; voluntariness and collegiality; democracy; periodic election and reporting. The Council carries out its activities in order to represent, protect, and promote the rights and interests of young scientists of subordinate institutions of the NAES of Ukraine, ensuring their active participation in scientific research. The Facebook page of the Council [48] constantly covers data on various events for young scientists, publishes various news and photo-reports of events in which members of the Council participate. Also, a Youtube channel was created to present activities and post recordings of various events organized by the Council.

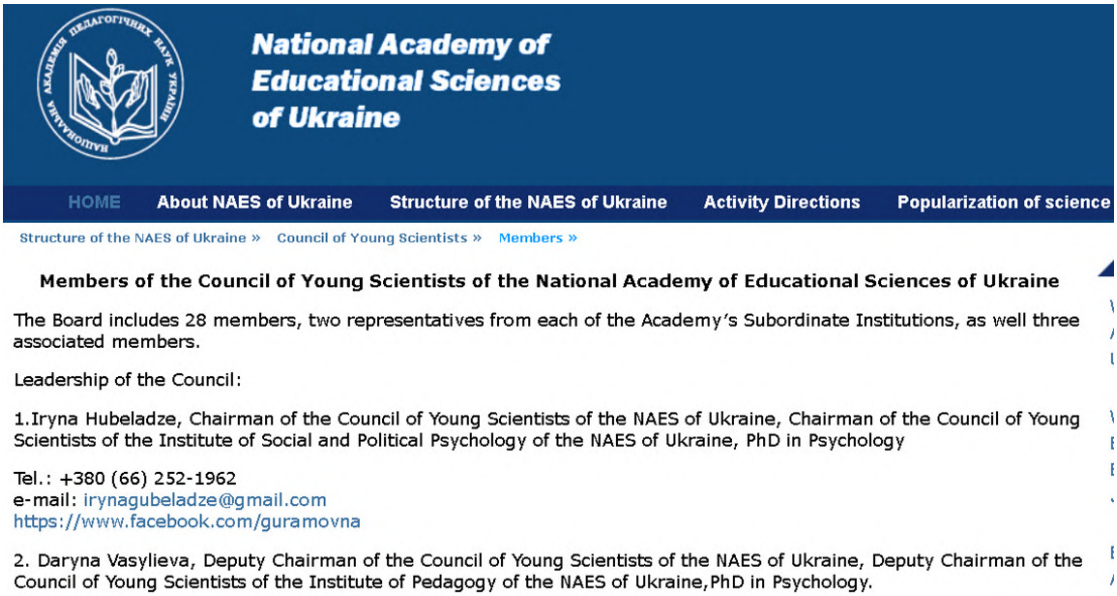

Figure 2: Website information about the Young Scientists' Council at the National Academy of Educational Sciences of Ukraine.

The main tasks of the Young Scientists' Council at the NAES of Ukraine are [49]:

- to unite young scientists of subordinate institutions of the National Academy of Educational Sciences of Ukraine in conducting scientific activities, to prepare proposals for the

development of the system of their grant, scholarship, and other forms of support;
- to promote the involvement of young scientists in competitions for scientific works, the formation of young scientists' teams to implement promising research projects;
- to promote scientific activities, advanced training, career growth, realization of creative potential, providing informational and organizational support to young scientists of subordinate institutions of the NAES of Ukraine;
- to support young scientists of subordinate institutions of the NAES of Ukraine in conducting scientific, scientific-organizational and scientific-educational activities;
- to promote the development and improvement of the scientific sphere of Ukraine and its integration into the world and European research space.

The Young Scientists' Council at the NAES of Ukraine provides such activities [49]:

- assistance in establishing professional contacts between the subordinate institutions of the National Academy of Educational Sciences of Ukraine, scientific, and higher education institutions of Ukraine, public scientific organizations and foreign scientific organizations to deepen scientific cooperation and joint scientific, scientific-organizational, and scientific-educational activities;
- ensuring information exchange among young scientists: dissemination of scientific and other information related to the activities of young scientists; providing information on awards, scholarships, grants, conferences, schools and other activities to support young scientists;
- participation in the nomination of applicants from subordinate institutions of the NAES of Ukraine for scholarships and awards for young scientists;
- organization and holding of scientific and scientific-practical conferences, seminars, schools, and other scientific, scientific-organizational, and scientific-educational events;
- popularization of science in Ukrainian society, in particular among schoolchildren and students, by organizing and conducting excursions, lectures, "scientific picnics" and other modern forms of educational work;
- preparation of proposals on improving the social guarantees of young scientists of the NAES of Ukraine, in particular improving the living conditions of young scientists through priority preferential youth lending for construction (reconstruction) and purchase of housing, including the provision of service housing, creating opportunities for their rehabilitation, proper scholarship support for Ph.D. and doctoral students;
- delegation of representatives of the Council to the composition of workgroups (expert commissions) created by the Presidium of the NAES of Ukraine to address issues related to the main tasks of the Council;
- creation and support of information resources of the Council in order to disseminate information about its activities, provide information support to young scientists, etc.;
- organization and holding of cultural, educational, and sports events, social projects.

Powers of the Young Scientists' Council at the NAES of Ukraine are: to represent the rights and interests of young scientists of subordinate institutions of the NAES of Ukraine; to delegate

members of the Council to participate in the general meetings of the NAES of Ukraine; to develop annual work plans of the Council and to ensure their implementation; to elect the Head, the Deputy Head, and the Secretary of the Council; to inform young scientists of subordinate institutions of the NAES of Ukraine about their activities; to make proposals to the Presidium of the NAES of Ukraine, public authorities, public organizations regarding the solution of problems of young scientists; to perform other functions that don't contradict the Regulations. The main events that are constantly held by the Young Scientists' Council at the NAES of Ukraine:

1. English-speaking seminar "OPEN UP!". In order to develop the *foreign language competence* of young scholars, the Council launched a monthly seminar, where everyone, regardless of the level of language proficiency, has the opportunity to gain experience of discussion in English. The coordinator is the Young Scientists' Council at the Institute of Social and Political Psychology of the NAES of Ukraine.
2. Round table "Scientific youth in the context of Ukraine's integration into the international educational and scientific space". The coordinator is the Young Scientists' Council at the State Scientific and Pedagogical Library of Ukraine named after V. O. Sukhomlinskyy. The round table is held to *exchange experiences* between young scientists of the National Academy of Educational Sciences of Ukraine and higher education and other scientific institutions of Ukraine.
3. Training-marathon "OPEN AIR". In order to put the results of scientific research into practice, the Council launched an annual training-marathon. The trainers are the members of the Council. The training topics are chosen annually by open voting.
4. All-Ukrainian scientific-practical conference of students, Ph.D. students and young scientists "Academic culture of the researcher in the educational space", which is held in cooperation with Sumy State Pedagogical University named after A. S. Makarenko in order to *defend the principles of academic integrity*. The coordinator is the Young Scientists' Council of the Ivan Zyaziun Institute for Pedagogical Education and Adult Education.
5. All-Ukrainian scientific-practical conference of young scientists "Scientific Youth". It is held to exchange experiences and to cooperate with the Young Scientists' Councils at the National Academy of Sciences, the Ministry of Education and Science, and single higher education institutions. The coordinator is the Young Scientists' Council at the Institute of Information Technologies and Teaching Tools of the NAES of Ukraine. Also, round tables and master-classes are held during the conference.
6. Cooperation with the Young Scientists' Councils of the National Academy of Sciences, the Ministry of Education and Science, and branch academies of sciences.
7. Seminars, master-classes for young scientists in order to develop digital competence and master webometric methods of evaluating scientific results.

The publication on the work of the Young Scientists' Council at the NAES of Ukraine [17] states that given the experience of European colleagues, it is extremely important to study the quality of Ph.D. training in Ukraine, opportunities for young scientists employment, mental health, work-life balance, geographical, intersectoral and interdisciplinary mobility at all stages of career, favorable research environment, (in)stability of employment, financing, and pensions, etc. The Young Scientists' Council at the NAES of Ukraine is actively involved in resolving these issues.

Let's also describe the features of the **Young Scientists' Council at the National Academy of Sciences of Ukraine** [64]. The Young Scientists' Council at the National Academy of Sciences of Ukraine (NAS of Ukraine) is a collegial elected advisory body of the NAS of Ukraine, which unites young scientists of scientific institutions of the NAS of Ukraine. The activity of the Young Scientists' Council at the NAS of Ukraine (figures 3, 4) is carried out on a voluntary basis and is based on the principles of scientific ethics; freedom of scientific creativity; equality of all its members; publicity and openness in work; voluntariness and collegiality; democracy; periodic election and reporting.

Figure 3: Website information about the Young Scientists' Council at the National Academy of Sciences of Ukraine.

The main tasks of the Young Scientists' Council at the NAS of Ukraine are:

- to unite young scientists in conducting scientific activities, to prepare proposals for the development of their grant system, scholarship and other forms of support;
- to promote the implementation of scientific activities, training, career growth, creative potential, providing informational and organizational support to young scientists of scientific institutions of the NAS of Ukraine;
- to support young scientists of scientific institutions of the National Academy of Sciences of Ukraine in conducting scientific, scientific-organizational and scientific-educational events;
- to promote the development and improvement of the scientific sphere of Ukraine and its integration into the world and European research space.

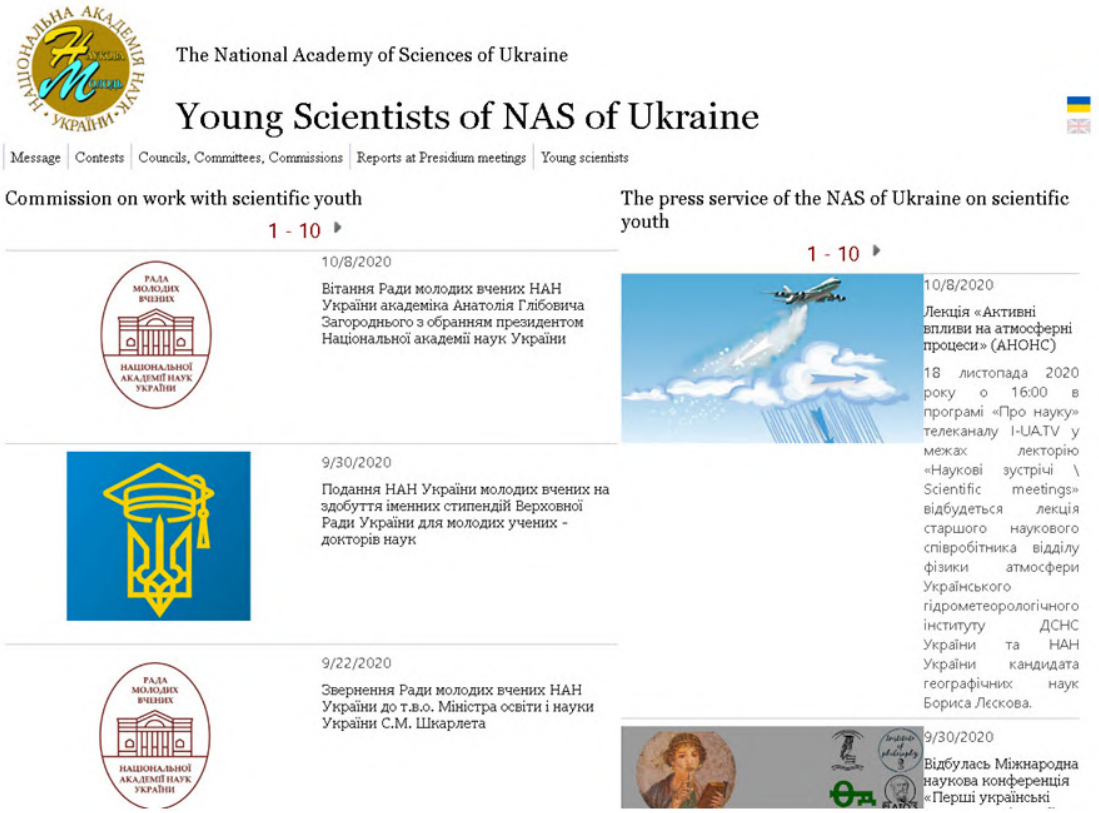

Figure 4: Website information about events and activities of the Young Scientists' Council at the National Academy of Sciences of Ukraine.

Areas of activity of the Young Scientists' Council at the NAS of Ukraine are as following:

1. To represent the interests of young scientists of the National Academy of Sciences of Ukraine, state and public organizations, and provide assistance in solving the young scientists' problems.
2. To promote the establishment of professional contacts between scientific institutions of the NAS of Ukraine, institutions of higher education of Ukraine, and foreign scientific organizations to deepen scientific cooperation and joint conduct of scientific, scientific-organizational, and scientific-educational activities.
3. To provide information exchange among young scientists: dissemination of scientific and other information related to the activities of young scientists; providing information on awards, scholarships, grants, conferences, schools, and other activities to support young scientists.
4. To organize and conduct scientific and scientific-practical conferences, seminars, schools, and other scientific, scientific-organizational, and scientific-educational events.
5. To popularize science in Ukrainian society, in particular among schoolchildren and students, by organizing and conducting excursions, giving lectures, "scientific picnics" and other modern forms of educational work.

6. To prepare proposals on improving the social guarantees of young scientists of the NAS of Ukraine, in particular the proper compensation for their work, improving the living conditions of young scientists, including providing them with official housing, creating opportunities for their recovery, proper scholarships for Ph.D. and doctoral students.
7. To delegate representatives of the Council to the working groups (expert commissions) established by the Presidium of the NAS of Ukraine to address issues related to the main tasks of the Council, and to the Commission on work with scientific youth of the NAS of Ukraine.
8. To create and maintain information resources of the Council in order to get acquainted with their own activities, provide information support to young scientists, etc.
9. To organize and conduct cultural, educational, and sporting events.

It is also important for this study to consider the experience of international associations of young scientists. For example, in Europe, a powerful organization that brings together young researchers from different countries is the **European Council of Doctoral Candidates and Junior Researchers – Eurodoc**, which is founded in 2002 as an international, non-profit organization. The [33] states that Eurodoc unites national organizations of graduate and junior researchers from 26 countries and is essentially a confederation of more than 35 national associations of graduate and junior researchers from the EU and the Council of Europe, which aims to unite the youth academia space in Europe and to represent its interests. The aim of Eurodoc's work is to develop an ERA in which all researchers have the same status and equal rights and opportunities (funding, pensions, social protection), to defend the interests of junior researchers. Eurodoc officially supports the European Charter for Researchers (recommendations of the European Commission's "good practices" for researchers and their employers) and the Personnel Policy Code for Scientists (employment and career advancement of researchers). Figure 5 presents the main page of the Eurodoc website (as of 2020).

The main tasks of Eurodoc activities are [13]:

- Represent doctoral candidates and junior researchers at the European level in matters of their education, research, and professional development.
- Advance the quality of doctoral programs and the standards of research activity in Europe.
- Promote the circulation of information on issues regarding ECRs and organize events.
- Participate in debates, and assist in the elaboration of policies about Higher Education and Research in Europe.
- Establish and promote cooperation between national associations representing doctoral candidates and junior researchers within Europe.

The Eurodoc website presents a variety of projects carried out by members of the organization and which you can join as a contractor or propose your own project.

2.2. Applying electronic social networks at higher education and research institutions

A significant increase in the diversity of electronic social networks and the number of their users is one of the forms of self-expression, self-presentation, and development of network

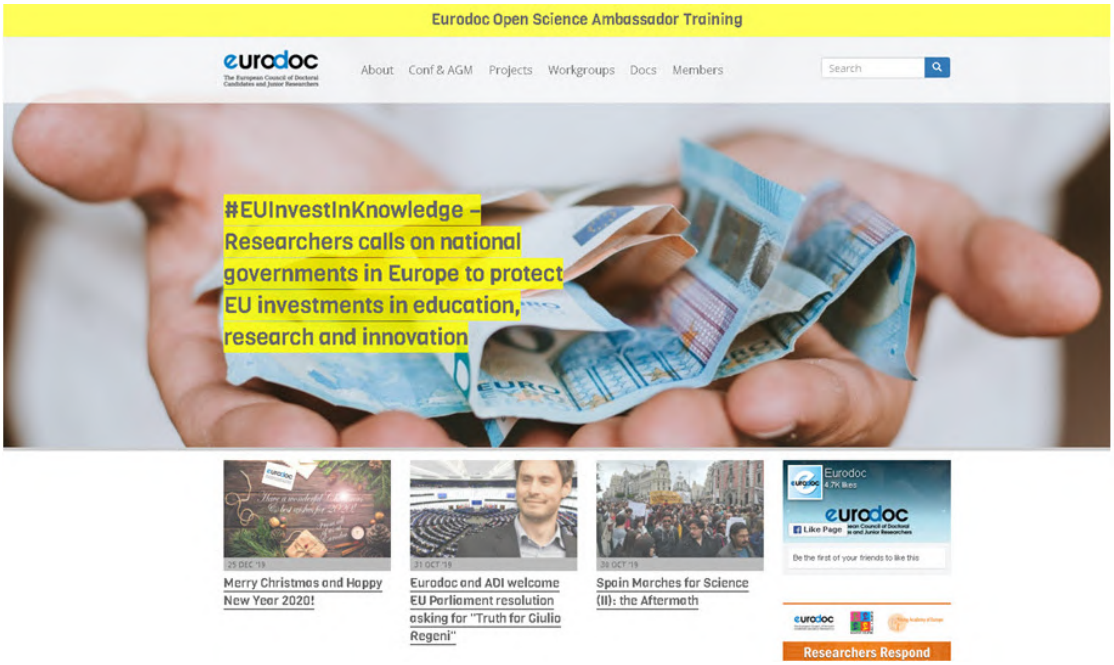

Figure 5: Eurodoc website main page (as of 2020).

communication, which is the basis of the digital society. Also, the electronic social networks' usage is an important tool for the development of the digital competence of users.

Electronic social networks have a different interface and purpose, their audience, mechanisms and certain rules. Scientists distinguish the following types of networks: professional, universal, thematic (academic or research) [19].

Users of electronic social networks have the following opportunities: the view of posted information regardless of location; its storage both in the closed mode (accessible only to the author), and open mode (accessible to all users); systematization of data and organization of search by keywords; collecting data into thematic groups; discussion of available materials; analysis and evaluation of the quality of information posted on the service, etc. This feature of online social services determines their advantages over global network sites, which are essentially just data warehouses. Network social services include: social search engines, social networks, blogs, Wiki, social media repositories, geographic information services [56].

The results of the study on electronic social networks usage in Turkish state universities are described in [1]. It is determined that among 658 teachers from eight different universities, the biggest motivating factor for such usage is that social networks provide fast and effective communication with colleagues and students [1]. A similar study on the electronic social networks' usage in universities was conducted among teachers and students of Malaysian and Australian universities. The studies' results showed that students found a number of advantages in using electronic social networks to interact with each other and with their teachers. The vast majority of students and teachers are positive about the electronic social networks' usage to enhance interaction with each other to get better learning outcomes and address organizational

issues related to learning [15].

Various scientific publications were analyzed to study the peculiarities of Twitter, Instagram, and WhatsApp usage in universities. The study [59] analyzed publications on Twitter usage for educational purposes. It is concluded that Twitter was most often used for communication and evaluation. Teachers send students important information on Twitter about courses, homework, and test deadlines [59]. The experience of Twitter and WhatsApp usage to teach medical students is described in [30]. It is noted that professional societies have used various social media platforms, such as Twitter and WhatsApp, to improve lifelong learning through online discussions in closed groups. WhatsApp usage allows you to quickly share and discuss learning material through group chat, based on the case-study method. The purpose of group learning chat is to discuss specific learning situations on a case-by-case basis and to stimulate interesting discussions. WhatsApp was chosen as an interactive platform because it allows you to send instant messages, an unlimited number of participants, encrypt texts at the end, and the ability to evaluate participation and engagement in the discussion [30]. Instagram can also be used for professional development and training. The experience of using Instagram to train future physicians in the discipline of radiology is described in the publication [53].

Exploring the peculiarities of Facebook network usage in universities, various scientific publications were analyzed. The results of a study on the electronic social networks' usage among future bachelors at the University of Western Australia are described in the article [4]. The study results showed that students were satisfied with their learning experience using Facebook because they were able to write their questions and get advice and answers from other students and teachers, they felt encouraged to learn through such cooperation [4]. The impact of the official Facebook group on learning outcomes is described in the study [60]. The results of the study showed that students who used the group on Facebook at the beginning of the training course reported a sense of greater social connection, better relationships with teachers, and less stress associated with training courses compared to students who did not have Facebook groups. Also, the presence of an official group on Facebook indirectly increased the satisfaction of the course through social connections. The impact of Facebook on distracting students from the learning process is described in the publication [14]. Modern requirements for socialization and processing of disparate information on Facebook can also have a detrimental effect on students' academic performance. After the study, teachers and students were informed about the importance of regulating their own behavior regarding the frequency of using Facebook for entertainment.

Features of the electronic social networks' usage to manage the educational social system are described in the paper [8]. The factors influencing the functioning of the educational social system are considered, the corporate social network's usage as an object of management is substantiated. The peculiarities of the corporate social networks' usage are analyzed, their potential for usage in the management of the educational social system is determined.

The publication [32] states that electronic social networks can be helpful to support the educational process of higher education institutions in the following areas: supporting the study of various disciplines; management of the educational process of a higher education institution; electronic social networks' usage to perform research work at the university; formation of the image of a higher education institution in the Internet environment.

As a result of the analysis of scientific publications [1, 3–5, 8, 14, 15, 30, 36, 43, 53, 59, 60]

and personal experience [19, 20, 24, 25, 32, 37] there are identified the benefits of electronic social networks' usage in educational and research institutions, namely: accessibility and free of charge; interest and motivation of users to apply them into everyday practices; user-friendly intuitive interface; creating of the content of one's own; possibility of operative messages' and multimedia data's exchange; the possibility of organizing thematic groups (for example, for the joint implementation of an educational or research project); availability of event planning functions; sending invitations, setting reminders; creating a portfolio of own works (completed creative tasks, educational projects, multimedia presentations, etc.); preparation and conducting of surveys on prominent topics; creation of short videos and their instant distribution or live broadcast from various events for joint viewing; mutual evaluation and discussion of the completed work ("likes" and comments); access from various devices (personal computer, tablet, smartphone, etc.); support of synchronous and asynchronous communication between network participants, etc.

2.3. Management of the Young Scientists' Council with the use of digital technologies

In the current conditions of digitalization of various sectors of society, the scientific field should take a leading position and actively implement digital technologies, especially with young scientists and graduate students. Also, the need for more active use of digital technologies was caused by the spread of the COVID-19 pandemic in the world and quarantine restrictions and measures [7, 44, 51, 61].

Let's consider the management of the Young Scientists' Council as a process of managing the social system. The essence of social management is organizational interaction. Organizational interaction is a conscious and controlled process, which is determined by the level of correspondence of needs, interests and goals of organized subjects of joint activity, namely members of the particular social entity. Management of organizational interaction process is inseparable from the management of social education (system) which is in constant development, and provides reliable information about the holistic functioning of this social education, as well as features and opportunities for innovative projects aimed at continuous improvement [6].

In the work of [8] the social system management is defined as a conscious purposeful activity, namely, the process designed to bring a social system or its component in line with needs, laws of functioning and development. Currently, the role of social networks in the management of social systems has significantly increased. The main opportunities for managing the social system with the help of social networks are following: discussion, polls, holding events, forming groups for joint work, administering group content, file sharing, instant messaging, online ad distribution, etc.

We will briefly describe the experience of the authors of this publication on working with young people in the scientific field, work on postgraduate training, ensuring the work of the Councils of Young Scientists and the use of digital technologies for the outlined issues.

1. *Anna Iatsyshyn* (Doctor of Pedagogical Sciences) initiated, created and was the Chairwoman of the Young Scientists' Council at the Institute of Information Technologies and Learning Tools, NAES of Ukraine (2016–2019). She created and administered the Council's

Facebook page and ran the Council's blog. Also, she was a member of the Young Scientists' Council of the National Academy of Educational Sciences of Ukraine (2016-2019). A. Iatsyshyn initiated and regularly held a quarterly seminar for junior researchers "ICT in Education and Research" (2010–2019). She organizes an Annual Conference for young scientists with using digital technologies.

2. *Iryna Hubeladze* (Ph.D. in Social Psychology) is the Chairwoman of the Young Scientists' Council of the Institute for Social and Political Psychology of the National Academy of Educational Sciences of Ukraine. In 2019, she was elected as a Chairwoman of the Young Scientists' Council at the National Academy of Educational Sciences of Ukraine. Since 2018 she is a member of the Young Scientists' Council at the Ministry of Education and Science of Ukraine; Plan S Officer and Bologna Follow Up Group Officer, member of working groups "Mental Health" and "Doctoral Training" in Eurodoc. I. Hubeladze constantly conducts various webinars and classes for junior researchers and not only with using digital technologies.
3. *Valeriia Kovach* (Ph.D. in Ecology), Deputy Head of the Young Scientists' Council, National Academy of Sciences of Ukraine, Head of the Young Scientists' Council at the Department of Nuclear Physics and Power Engineering of NAS of Ukraine. Represents the State Institution "The Institute of Environmental Geochemistry of the National Academy of Sciences of Ukraine" and the Educational and Scientific Institute of Continuing Education of the National Aviation University (administers Facebook pages). Constantly conducts various webinars and classes for students, young scientists with the use of digital technologies.
4. *Valentyna Kovalenko* (Ph.D. in Pedagogy). Since 2019 she is the Chairwoman of the Young Scientists' Council at the Institute of Information Technologies and Learning Tools of the NAES of Ukraine. She constantly sends by e-mail to graduate students and junior researchers various information about events held for young people; organizes and conducts a quarterly seminar for young scientists "ICT in Education and Research". Also, conducts various webinars and classes for students and graduate students using digital technology.
5. *Volodymyr Artemchuk* (Ph.D. in Technology) is a Chairman of the Young Scientists' Council at the Department of Physical and Technical Problems of Power Engineering of NAS of Ukraine, Chairman of the Young Scientists' Council of G.E. Pukhov Institute for Modelling in Energy Engineering of NAS of Ukraine, member of the Young Scientists' Council at the NAS of Ukraine. He organizes an Annual Conference for young scientists using digital technologies; created and administered two Telegram channels for junior researchers: @CYSNASU and @YEnergyS.
6. *Maryna Dvornyk* (Ph.D. in Social Psychology) is a Deputy Chairwoman (2017–2019), a member (currently) of the Young Scientists' Council at the Institute for Social and Political Psychology of the National Academy of Educational Sciences of Ukraine. She is a co-organizer of educational events, workshops for young scientists, active user and promoter of digital technologies in the field of mental health.
7. *Oleksandr Popov* (Doctor of Technical Sciences) is a member of the Young Scientists' Council at the State Institution "The Institute of Environmental Geochemistry of the National Academy of Sciences of Ukraine" and a member of the Young Scientists' Council

of G.E. Pukhov Institute for Modelling in Energy Engineering of NAS of Ukraine. For many years co-organizes an Annual Conference for young scientists on digital technologies.

8. *Andrii Iatsyshyn* (Doctor of Technical Sciences) was a Chairman of the Young Scientists' Council of G.E. Pukhov Institute for Modelling in Energy Engineering of NAS of Ukraine of Ukraine (2006–2016). He was also a Chairman of the Young Scientists' Council at the State Institution "The Institute of Environmental Geochemistry of the National Academy of Sciences of Ukraine". For many years he has been organizing and holding an Annual Conference for young scientists using digital technologies.

Analysis of publications and own experience allowed us to identify several areas of application of digital technologies to manage the activities of the Young Scientists' Councils.

Firstly, it is important for the Young Scientists' Council to have a separate page on the official website of its host institution. Above (figures 1, 2, 3, 4) information about the Young Scientists' Councils and their activities on the websites of various institutions has already been presented. These pages should contain at least a minimum of information: a list of Board members, Regulations, action plan, work reports, and be sure to provide links to other pages of the Board on various social media (Facebook, Twitter, YouTube, etc.).

Secondly, it is important to create a page "Council of Young Scientists" in the social network to ensure the activities and communication with young scientists. In figure 6 there is the page of Young Scientists' Council at the Ministry of Education and Science of Ukraine and the page of Young Scientists' Council at the National Academy of Educational Sciences of Ukraine on Facebook were submitted. As of October 2020, the page of the Young Scientists' Council at the National Academy of Educational Sciences of Ukraine was signed by 561 people, and the page of the Young Scientists' Council at the Ministry of Education and Science of Ukraine was signed by 6327 people. For example, Facebook services allowed to post on the official page of Young Scientists' Council video recordings of various events and activities (figure 7), create separate pages with different events, post photos, posts and messages, polls, as well as receive statistical reports on various aspects of the page (the number of "likes", the number of subscribers to the page, the distribution of page users by gender, age, etc.). Also, the authors of this paper have experience in creating closed groups on Facebook to discuss important issues, to work together on certain draft documents, etc.

In figure 8 the pages of the Young Scientists' Council at the Institute of Information Technologies and Teaching Aids of the National Academy of Educational Sciences of Ukraine and of the Young Scientists' Council at the Institute for Social and Political Psychology of the National Academy of Educational Sciences of Ukraine on Facebook are presented. Also, on the page of the Council it is possible to post about the activities of other organizations and interesting events for junior researchers; disseminate the scientific results of young scientists by posting links to them or announcing where they can be viewed or downloaded. On social networks you need to subscribe to the selected person or thematic page and then the new arrivals will be displayed in the user's news feed.

Thirdly, to expand the channels of communication of young scientists, a wider presentation of their activities, the organization of thematic groups, the Young Scientists' Council should create pages on various social media: Twitter, Instagram, YouTube and others. In figure 9 presents a YouTube channel and a Twitter page of the Young Scientists' Council at the Ministry of

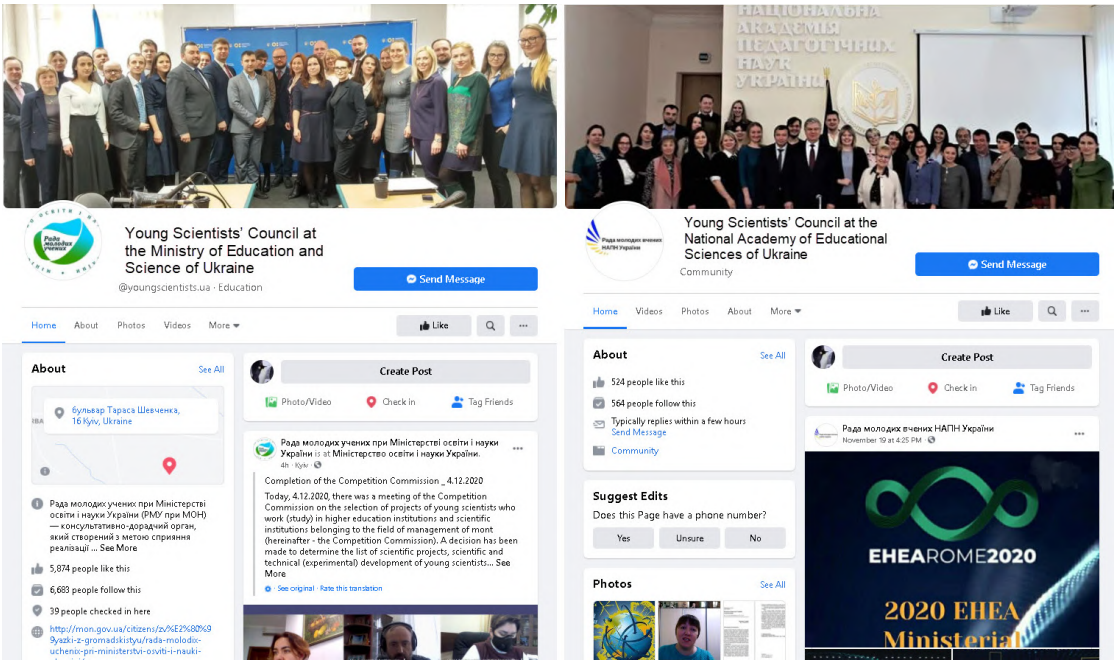

Figure 6: Pages of Young Scientists' Councils on Facebook.

Education and Science of Ukraine. Also, with the help of these social media can be a significant informational impact on junior researchers and the general public which will lead to awareness, change public attitudes towards scientists and the results of scientific research, promote scientific achievements and science among young people.

In figure 10 the Telegram channel for young scientists [10], supported by the Young Scientists' Council of the National Academy of Sciences of Ukraine is presented. As the channel was recently created, there are only 224 followers; the number of participants is increasing.

Fourthly, to ensure the activities of the Young Scientists' Council, it is important to constantly send e-mails on various aspects of the work, on activities, on surveys of young scientists and other organizational issues. Therefore, you need to create an e-mail box of the Council and use it for various mailings and when registering different pages in social media, you can specify this e-mail.

In figure 11 the example of sending materials from the Young Scientists' Council at the Ministry of Education and Science of Ukraine is shown. You can also use both email and special services, such as Google Forms, to organize various surveys, questionnaires, or event registrations. In figure 11 shows an example of using Google Forms to register for the Scientific Youth 2020 conference. These specialized services help reduce the time for organizing various events and improve the visual presentation of statistics about the event. Statistics on Google Forms for Young Scientist Conference Participants are provided in figure 12.

Therefore, we believe that the mandatory use of a variety of digital technologies is essential for the effective management of the Young Scientists' Council.

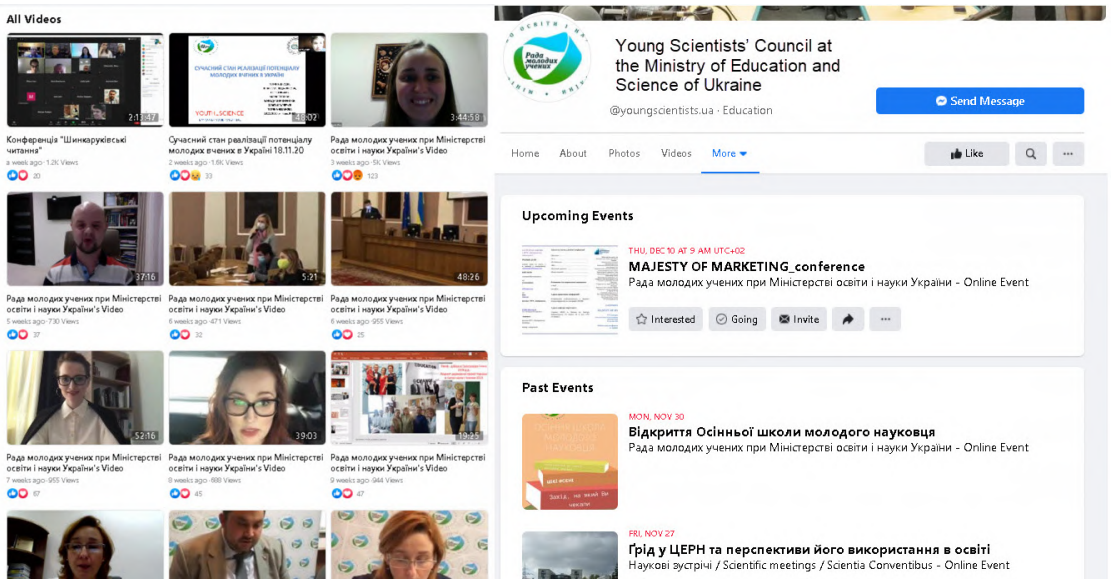

Figure 7: Videos of various events and activities on the page of Young Scientists' Council at the Ministry of Education and Science of Ukraine on Facebook.

2.4. The use of electronic social networks for scientific events organization and conducting

In current conditions of digital transformation of society anyone can choose the most convenient means and conditions for communication, self-education, research or dissemination of their own work. Nowadays, electronic social networks, thanks to the convenience of their tools and services, have become the main ones for quick public feedback. We confirm that electronic social networks are a convenient way to interact between researchers from different countries. Now it is easier and faster to share experiences and disseminate research results, observe participants' reactions to discussions or information on specific issues, invite people to participate in various scientific events.

Every day a large number of scientific mass events are held in the world: conferences, seminars, webinars, master classes, trainings, etc. on topics related to various scientific researches, new books and journals are published. Researchers try to disseminate their scientific results to colleagues by posting links to them or announcing where they can be viewed or downloaded. In scientific social networks, as well as in usual: it is necessary to subscribe to the chosen person or the thematic page and new receipts will be displayed in your news feed. Also, many researchers want to share their experiences in professional networks, in order to hear feedback about their work. From time to time you should use the statistics tools offered in most electronic social networks. The received analytical reports will show which materials attract the most attention and approval and from which countries users were interested in your publications [27].

The manual [27] states that the use of electronic social networks to support and conduct research and to publish and disseminate scientific results is called "information and analytical support for research", which is interpreted as assistance to research activities in obtaining and

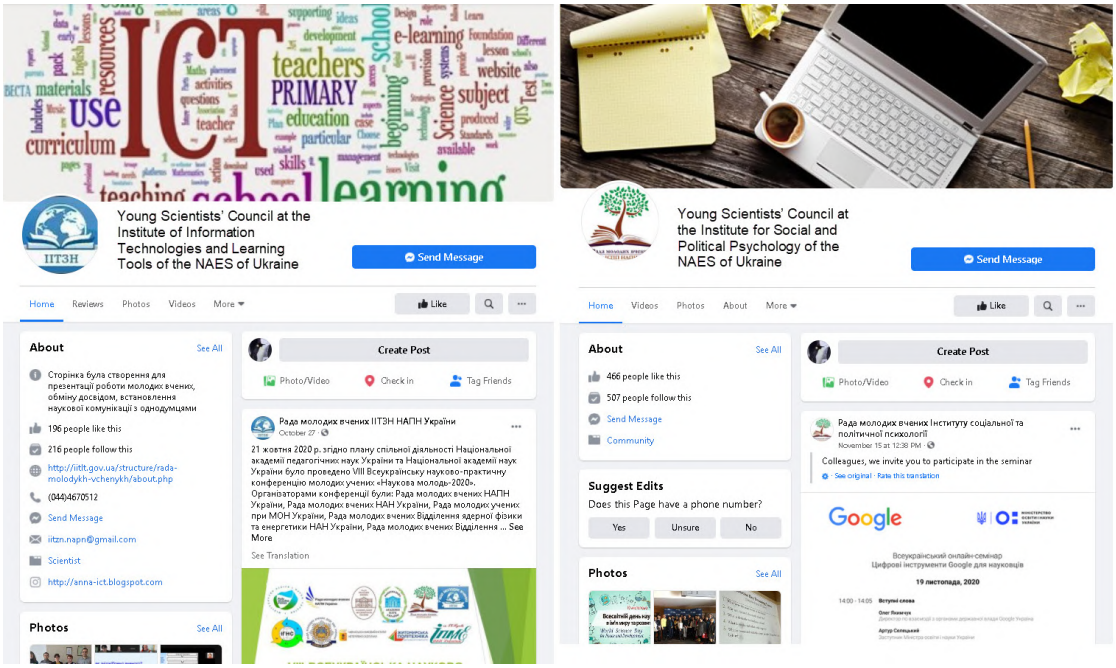

Figure 8: Pages of the Young Scientists' Councils on Facebook.

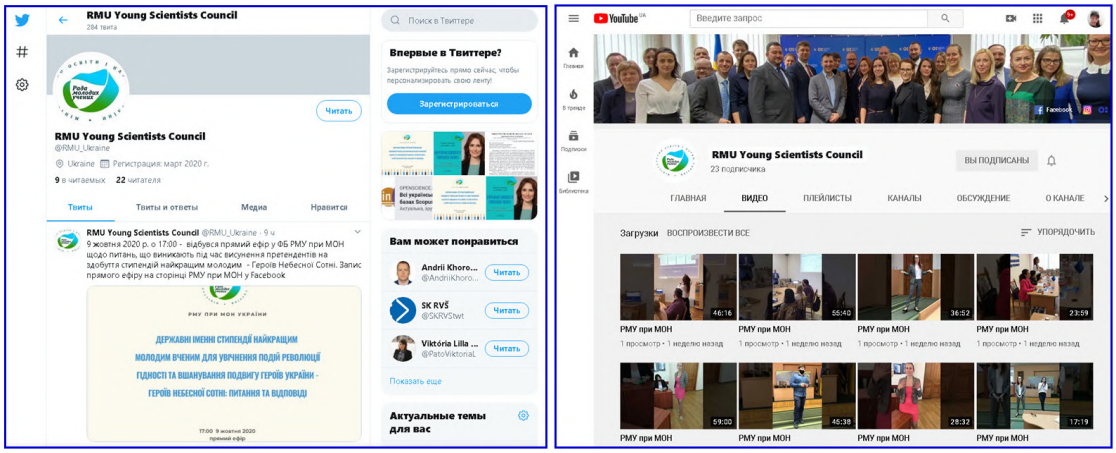

Figure 9: YouTube channel and Twitter page of the Young Scientists' Council at the Ministry of Education and Science of Ukraine.

analytical processing of information and data by ICT on the processes of planning, organization, conducting and implementation of research results. The system of information and analytical support of scientific research primarily involves the use of statistical, information-analytical, sciecometric services of electronic open systems [27].

Informational support of scientific mass events is an important factor in their effective conduct and involvement of more participants. Varieties of information support are: messages on radio or

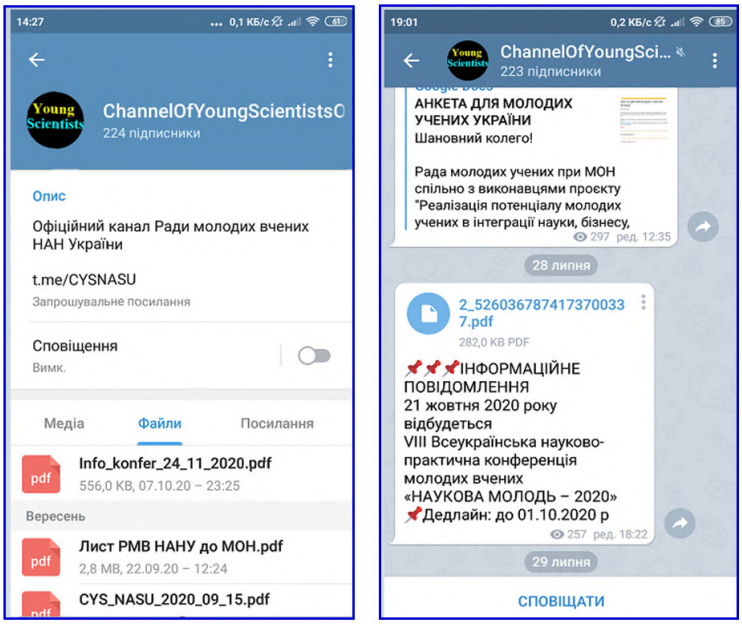

Figure 10: Telegram channel for junior researchers supported by Young Scientists' Council at the National Academy of Sciences of Ukraine.

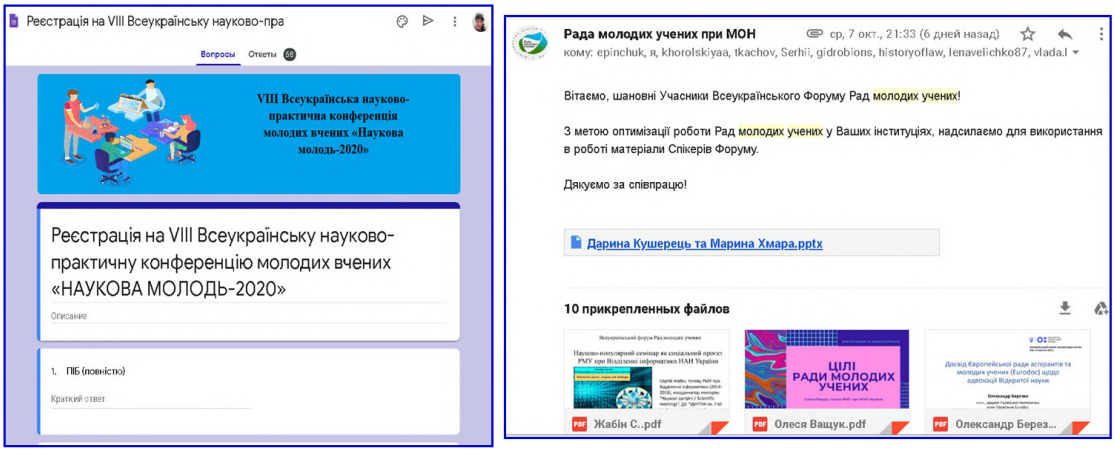

Figure 11: Example of using e-mail and Google Forms for Young Scientists' Councils.

television, publication in print media (newspapers, magazines), posters, and ads on websites or blogs. Currently, the information support of scientific mass events with the use of its traditional types is decreasing, and on the contrary, the announcement of scientific mass events through electronic social networks is spreading. After all, submitting ads on the Internet is easy and free. Therefore, the simplest means for information support and for the organization of scientific mass events is the Internet, and in particular electronic social networks.

Let's analyze the main stages of the organization of a scientific mass event and features of

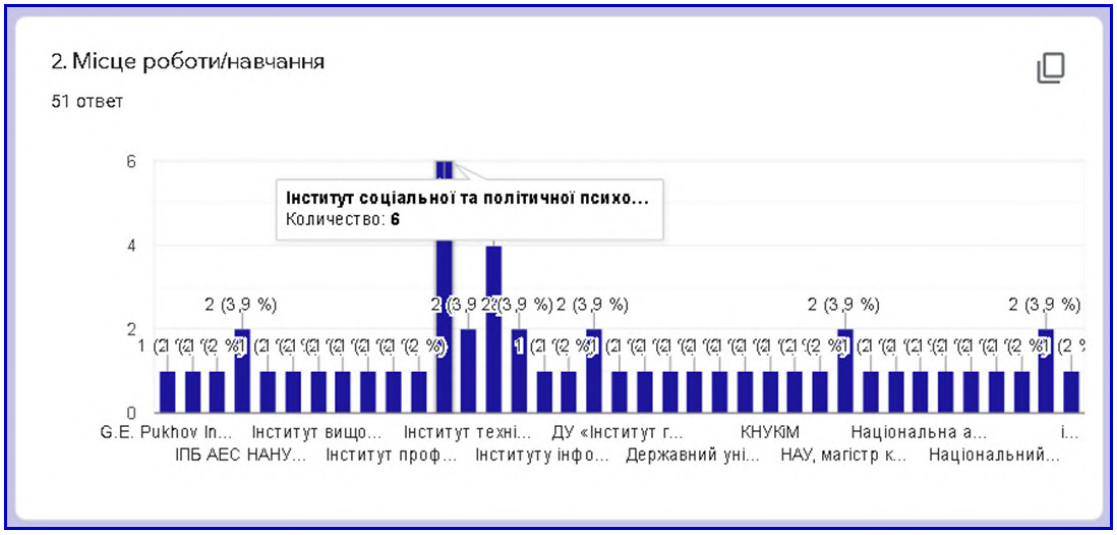

Figure 12: Google Forms Statistics on Participants of Young Scientists' Conference.

the use of electronic social networks at each stage:

1. To define the problems of a scientific action, separate directions (names of sections; to outline a range of issues). The purpose of the scientific event, for example is publication of scientific ideas of the authors; creation of a scientific society; implementation of communication between representatives of various scientific societies [2]. You need to decide on the members of the organizing committee and divide the responsibilities among the organizers. Prepare an information letter (information message), which is the business card of the scientific event. To perform the above tasks, you can create a closed group in the electronic social network and involve participants, discuss each aspect, you can vote among the participants, put up drafts of the information letter and comment on it, and others.
2. To use a special function in social networks "Events". Announcements about scientific events on electronic social networks can be made in different ways: by posting on a personal page (this news will be seen by your friends); by creating a separate "Event" page with a photo and a detailed description of such an event and with the ability to quickly send to friends and invite them to this event, you can also see how many people are interested in this event and who want to attend it, as this page displays data. You can also advertise a specific "Event" on both the personal page and the page of a specific organization or association, which will significantly increase the number of participants.

For example, we will report on scientific activities that have been posted on the electronic social network Facebook. In figure 13 a Facebook page with a reminder of events that the user is interested in, added to their events and plans to take part in is shown. We will describe them in more detail.

Figure 14 shows that 272 people plan to take part in the international conference.

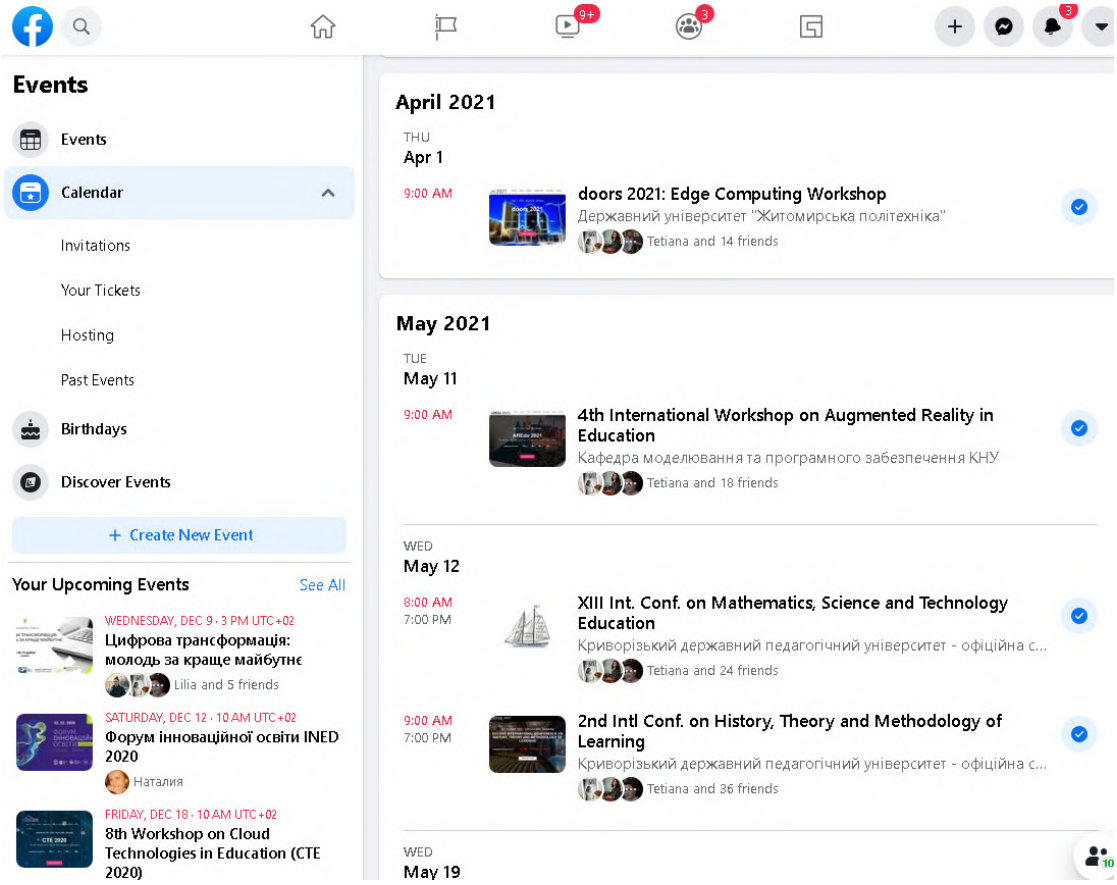

Figure 13: Information about upcoming events on Facebook on the user's personal page where he/she is going to participate.

Figure 15 presents statistics from the page of the Young Scientists' Council on the number of people who reviewed the publications. The largest number of views (411 views) was in the publication on the conference.

Thus, the use of electronic social networks for the organization of scientific events has a number of advantages and features: free advertising of the scientific event; opportunity at any time to join, plan to participate, get interested; possibility of operative organization of discussion some organizational issues; free access to all presented conference materials; opportunity to receive statistical data on those wishing to take part in the scientific event, statistical data on the number of people interested in the event; statistics about users who liked the event, etc. We believe that the use of electronic social networks is promising for the organization and dissemination of messages about scientific events and to support scientific communication.

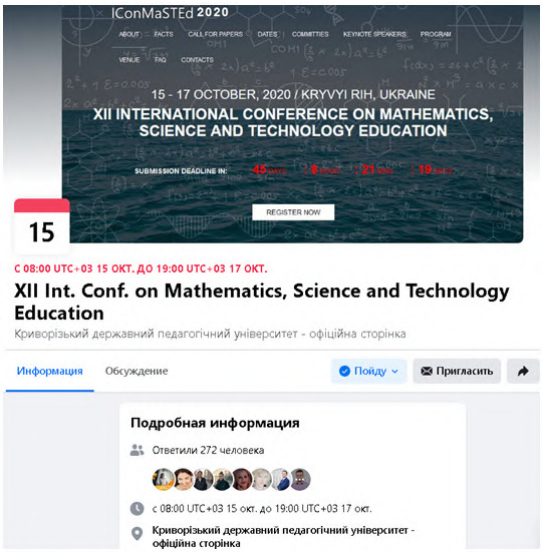

Figure 14: Facebook page of the International Scientific Conference and information on the number of people who plan to take part in this event.

3. Conclusions

For countries seeking global recognition, it is important to increase the prestige of scientific activity and encourage talented young people to participate in research projects. An important role in this process belongs to the Young Scientists' Councils, which are created at scientific institutions, institutions of higher education and regional state administrations.

Large-scale digitization of all public spheres and quarantine restrictions caused by the COVID-19 pandemic has forced the use of various digital technologies. The scientific and educational spheres should occupy leading positions and be role models in the application of digital technologies, especially in the training of students, graduate students and in working with young scientists.

On the basis of the analyzed scientific literature and own experience of digital technologies implementation for the organization of Young Scientists' Councils activity the following conclusions are made:

1. *The peculiarities of Young Scientists' Councils* activity are following: provide conditions for further staff development of the institution in which they operate; contribute to the social, psychological and material support of young scientists and graduate students; create an environment for teamwork and collaborative partnership; promote the development of leadership and organizational qualities; contribute to the development of digital competence.
2. *The advantages of using electronic social networks* in higher education and research institutions are: general popularity and free; prompt exchange of messages and multimedia data; user-friendly interface; availability of event scheduling functions, sending invitations, setting reminders; support of synchronous and asynchronous communication between

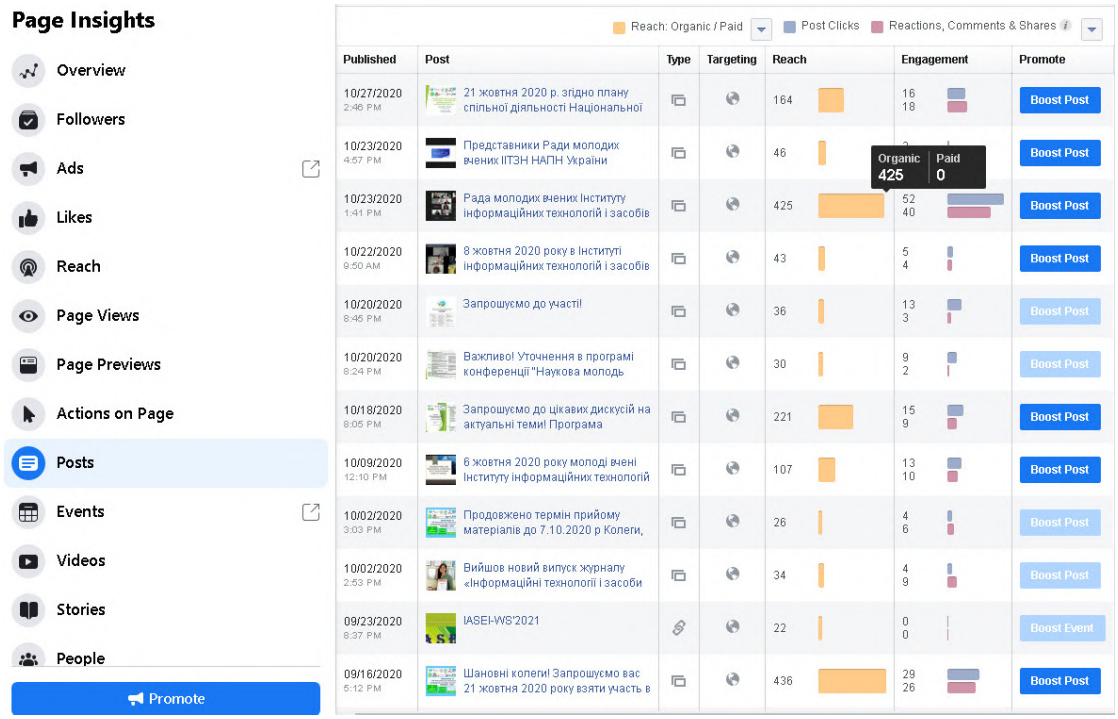

Figure 15: Data from the statistical service of Facebook on publications on the page of Young Scientists' Council at the Institute of Information Technologies and Learning Tools of the NAES of Ukraine in 2020.

network participants; possibility of access from various devices; a powerful tool for organizing the learning process; possibility of organization and work of closed and open groups; advertising of various events, etc.

3. *Features of management of Young Scientists' Councils activity with application of digital technologies are defined.* The Young Scientists' Council with a social system, and therefore the management of this system refers to social management. The key idea of social management is organizational interaction. Management of the process of organizational interaction is inseparable from the management of the social system as one that is in constant development, requires the implementation of various projects aimed at continuous improvement of its activities. The effectiveness of the use of digital technologies to manage the activities of the Young Scientists' Council depends on the intensity and need for their use to implement organizational, presentation functions and ensure constant communication.
   The analyzed scientific publications and the own experience of the authors of this paper on ensuring the functioning of the Young Scientists' Councils, helped to identify the following areas of application of digital technologies for the organization of associations of junior researchers:

   - for the presentation of activities (page on the official website of the institution where the Council operates, YouTube channel, pages on social networks: Facebook, Instagram);

- to send various information to young scientists (e-mail, Telegram, Twitter, etc.);
- for conducting questionnaires, surveys (e-mail, Telegram, Google Forms, etc.);
- for the organization and holding of scientific mass events (Facebook, Google Forms, Zoom, Google Meet, Microsoft Teams, etc.);
- to organize the work of thematic working groups, to hold working meetings of the Council (Facebook, Telegram, Zoom, Google Meet, Microsoft Teams, etc.).

4. *The experience of application of electronic social networks for the organization and carrying out of scientific mass actions is generalized.* Thus, one of the main advantages of using electronic social networks for information support of scientific mass events is: receiving quick feedback; convenience of tools and services; opportunity to invite those interested to participate in various scientific events; create a separate page for a scientific event; receive statistics on participants in events; to make a video broadcast of events; store photos and videos of scientific events, etc.

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