

UDC 811.111

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### INNOVATIONS IN UPDATED SCIENTIFIC COMMUNICATIONS

*The paper examines innovational approaches in scientific communications, which become rather popular in our days and are designed to form scientific literacy among wide segment of society. The main idea of modern scientific communication is that the science must be presented as somewhat useful and interesting, available for "common people". The role of scientist turns from "overman" to "common man" who has sense of humor, hobbies and is open for the world as everybody. The first thing that must be explained while scientific communication is how the scientific discovery and it's results may be used in everyday life, what benefits it will bring, what is its practical value. All methods of scientific communications are viewed in context of three groups. The first one is classical and means information exchange by using of media sources, such as TV, radio, magazines etc. Other groups are rather new for Ukraine, but they are rapidly developing. The group of communications by live interaction becomes plenty popular. It includes all methods of face-to-face interplay between scientist and the receivers of information. Another updated group of methods of scientific communication is online interaction that provides communications by means of Internet-sites, social networks, blogs electronic databases etc. The significance of science communication for individuals and society is considerable. It forms the progressive view on science, promotes democratization and ethical solution of many problems.*

*Keywords: scientific communication, scientific literacy, methods of scientific communication, progressive view on science, interesting science, useful science, live interaction, online interaction, media communications, science busking.*

### ІННОВАЦІЇ В СУЧАСНИХ НАУКОВИХ КОМУНІКАЦІЯХ

**Ткачук С.В., Стахурська С.А., Стахурський В.О.**

*Досліджуються інноваційні підходи до здійснення наукових комунікацій, метою яких є формування наукової грамотності та прогресивного погляду на науку серед широких верств суспільства. Головна ідея сучасних наукових комунікацій розглядається з точки зору висвітлення практичного значення наукових досліджень та їх результатів для повсякденного життя людини і суспільства. Роль вченого трансформується від «надлюдини» до «звичайної людини». Висвітлюються сучасні методи наукової комунікації із поділом їх на три групи: медіа-комунікації, жива взаємодія та взаємодія онлайн. Розглядається питання значимості ефективної наукової комунікації для індивідуума та суспільства.*

*Ключові слова: наукова комунікація, наукова грамотність, методи наукової комунікації, прогресивний погляд на науку, цікава наука, корисна наука, жива взаємодія, взаємодія онлайн, медіа-комунікації, наукові шоу.*

## ІННОВАЦІЇ В СОВРЕМЕННЫХ НАУЧНЫХ КОММУНИКАЦИЯХ

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*Исследуются инновационные подходы к осуществлению научных коммуникаций целью которых является формирование научной грамотности и прогрессивного взгляда на науку среди широких слоев общества. Главная идея современных научных коммуникаций рассматривается с точки зрения освещения практического значения научных исследований и их результатов для повседневной жизни человека и общества. Роль ученого трансформируется от «сверхчеловека» до «обычного человека». Освещаются современные методы научной коммуникации с разделением их на три группы: медиа-коммуникации, живое взаимодействие и взаимодействие онлайн. Рассматривается вопрос значимости эффективной научной коммуникации для индивидуума и общества.*

*Ключевые слова:* научная коммуникация, научная грамотность, методы научной коммуникации, прогрессивный взгляд на науку, интересная наука, полезная наука, живое взаимодействие, взаимодействие онлайн, медиа-коммуникации, научные шоу.

**Problem statement.** Nowadays the exchange of scientific knowledge is on its way to new level. The new methods and instruments of scientific communications are regularly appearing in response to rapid changes in information technologies, market requirements and mentality of society and individuals. The task is to study the modern trends in scientific communications and to implement them into Ukrainian science and education.

**Latest research and publications analysis.** In accordance with latest research and publications analysis, the modern tools of scientific communications are being regularly enriched. Among the authors, whose works are dedicated to studying of theoretical and practical aspects of this question we can't, but mention, K. Bultitude [2], M. S. Jucak [3], F.B. Wood [5], S. Chemerkin [8], T. Yakhontova [9] and others. *The genre innovations in scientific communications by T. Yakhontova merit the attention for their practical importance, especially the video abstract in aspect of development of informational interactive technologies [9]. Rather interesting list of types and instruments of science communications is represented by K. Bultitude [2]. The sources of information exchange are divided into three groups: traditional journalism, live or face-to-face events and online interactions [2]. Also, speaking about the dissemination of scientific discoveries and innovations, we can't, but mention about the social responsibility of scientists, which is considered in works of F.B. Wood [5].*

**The purpose of article** is to review the recent trends and innovations in scientific communications for further implementation of the modern tools into scientific and educational process.

**The main results of the research.** To make the scientific communications really effective, we first must realize the importance of such communications. So, we must answer the question: what is the aim of propagation of new knowledge and findings? To our opinion the main aim of scientific communication is scientific literacy of people and, as the result, forming of progressive view on the science among broad segments of society (fig. 1).

So, spreading of scientific information among broad segments of society must form the scientific literacy of people, and, as the result, the progressive view on science not only among scientists, but among so-called "common people". Even a child knows how to contact in Facebook, because it is simply and he (or she) understands for what it is done. So, obviously, the child could understand almost every scientific innovation if it would be explained in common, not scientific, words and with illustrating of its practical advantage. The progressive view on science among broad segments of society gives the next positive results:

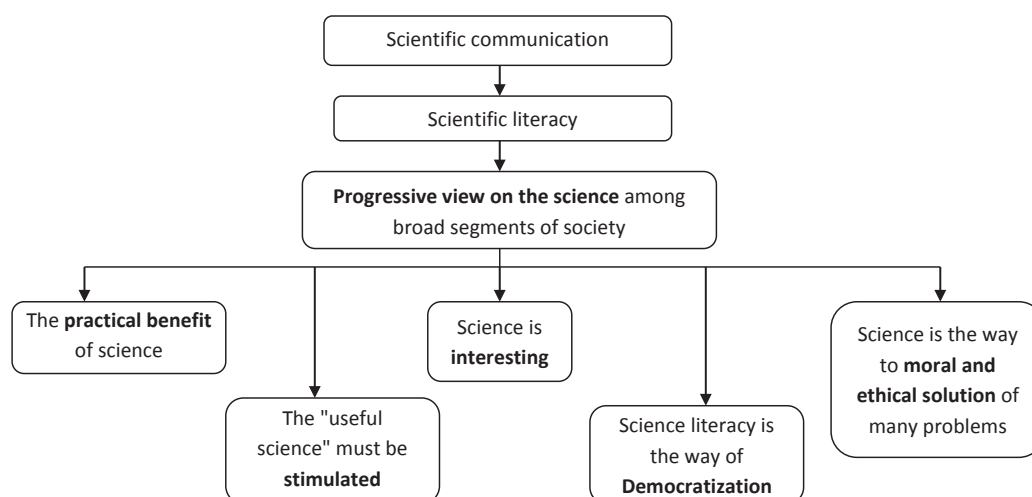
- people will understand the practical benefit of science, they will realize, how they can use of scientific knowledge in their everyday life, professional field, self-realization etc;
- understanding of practical sense of science will cause the stimulation of useful, progressive science projects by government agencies and private investors;
- people will understand, that science is interesting, that it is useful and common and that scientist is "common man", like them, not the "overman";
- scientific literacy will contribute to the democratization of society, more conscious attitude to political elections and reforms;
- scientific literacy will promote ethical and moral solution of many problems (awareness of the impact of human activity on climate and ecology, developing of effective systems of waste utilization, implementation testing of products and components in synthetic laboratory conditions, as opposed to tests on animals etc.) [1–3].

So, the significance of scientific communication is rather considerable. But how to make such communication effective? There are several approaches to insurance the efficiency of scientific communication:

- explanation of the essence of scientific discoveries as opposed to simple ascertain of facts;
- accent on benefits that brings scientific discovery for individuals, nature, society;
- using of simple, not scientific, terms, especially if communication takes place among scientist and not scientist;
- explanation of possible social, ethical and other consequences, which may take place as a result of scientific discovery implementation;
- using of creativity during scientific communication, for example convincing and entertaining methods, such as humor, metaphor, interesting stories. The scientists, who are widely involved in scientific communication can even improve their qualifications by mastering the actor art [2].

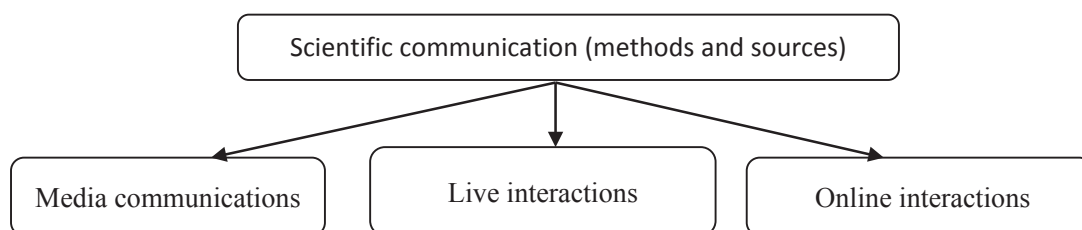
Speaking about the exchange of scientific information, it is necessary to consider the updated methods and sources of scientific communication. They can be divided into three groups (fig. 2).

Media sources are the most classical group of scientific communication methods. They include such sources as magazines, TV-programs, radio and so on. The main advantage of this method is an



**Fig 1. Significance of Science Communications for Individuals and Society**

Source: created by the author based on [1–3, 5]



**Fig. 2. Methods of Updated Scientific Communication**

Source: created by the author based on [1–10]

opportunity to cover of a large audience. But, on the other hand, such communication is one-sided; the interaction between scientist and the receiver of information is not available.

The more modern group of method is live interaction, which includes the next ways of scientific communications: public lectures, scientific master-classes, science cafes, Sci-art, science busking etc. All these methods permit the interaction between scientist and information receivers and also make possible to show, that science is simple and interesting. Science buskings are rather popular abroad and rapidly developing in Ukraine. For instance, catering show "Science Tricks" and project "Eureka" proposes the entertaining programs for children and adults that combine amusements and study [6; 7]. The programs of children's parties are organized in format of "edutainment" (education and entertainment) [7]. Another method of modern scientific communication, that deserves special attention, is Sci-art (science art). It is the updated stream that is located at the intersection of science and art. Speaking about foreign experience in this field, we can't, but mention about SciArt Center (New York) that combines not only science art in classical understanding, but also the elements of media communications and online interaction [4]. Sci-art becomes rather popular in Ukraine. For example, in 2015 the Science Art Laboratory was opened in Dnipropetrovsk, which worked in different sections: Educational and Awareness Raising, Creation and Maker, Exhibition [10].

Nowadays the third group of science communication methods, methods of online interaction, is of great demand. It includes such sources of information exchange, as Internet sites, blogs, wiki, social networks, electronic databases, Internet-conferences etc. The methods of online interaction permit to cover wide audience, but protection of information copying is rather low.

Conclusions. Updated requirements dictate to use modern instruments of scientific communication in order to make the information exchange effective and, as a result, to form the scientific literacy and progressive view on science among wide circles of public. The main condition of effective science communication is understanding of benefits of science discoveries for everyday life, presentation of science as something interesting, using the humor, storytelling and other instruments. According to the new conditions and streams the new methods of scientific communication are arising. All of them can be divided into three main groups: media communications, live interactions and online interactions. Media communication is more classical group of methods, while the other groups are on the stage of growth and development. Master-classes, science art, science busking and other methods of these groups are intended to spread science discoveries among wide segment of "common people" and to form scientific literacy in society.

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