Creating an Open-Access Student Scientific Journal with the Help of "Open Journal Systems" at the UNESCO Center "Junior Academy of Sciences of Ukraine"

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Summary
This paper explores the opportunities for scholarly publishing as part of the educational activities of the system of extracurricular research and experimental education, UNESCO Category 2 Centre, "Junior Academy of Sciences of Ukraine" (hereinafter referred to as the JASU), using Open Journal Systems (hereinafter referred to as OJS) publishing platform. Based on the survey data and taking into account the benefits of using the OJS platform, the authors propose a procedure for the launch of an open-access student scholarly e-journal at the JASU with due consideration of students' needs. The paper provides a brief description of the work stages and outlines the structure of the task group in charge of the development of the journal, and suggests the means to optimize the journal content. The authors also propose the definition for the concept of "scholarly communication in the digital age".

Keywords:
open access; scholarly communication; UNESCO Centre, "Junior Academy of Sciences of Ukraine; gifted students; Open Journal Systems

Introduction

Open access to scholarly information is provided now by online research journals, which, in fact, constitute a challenge for traditional print-based publications (Bhattacharyya et al., 2012). Their share in the information space continues to grow, as well as their popularity. However, there is an opposite point of view regarding the translation of traditional, print-only academic publishing to parallel print and online open access publishing. In particular, many publishers of print academic editions, library administrators, teachers, and university leaders strongly oppose the initiative of open access publishing. They argue that the openness of scholarly information provides a challenge to the authors, who may lose their copyright, and to publishers, who may lose their profits and reputation, which will disrupt the established relationships between all stakeholders (Salo, 2013). The growth of open access to scholarly information has also raised some purely ethical issues, which are of secondary importance in the ongoing moves towards open information. In practice, ethics matters across the entirety of the research process, including design of the process and instruments, data collection through to dissemination (Farrow, 2016). Copyright infringement and dishonesty practices are mainly observed among undergraduates developing research projects and writing scientific articles (Mâtă et al., 2020).

The vast majority of electronic publications are established on demand and focus on research organizations or institutions of higher education. The rate of introduction of innovative and communicative technologies in the educational process is indicative of the state of education in general and the level of social advancement. Many different computer systems and information technologies, electronic resources, and libraries have emerged recently to create the most accessible and user-friendly environments for the learning and sustainable development of youth. These innovations give impetus to talented and science-prone students' engagement in research and their conscious self-education throughout life, which is necessary to become more responsive to the needs and ambitions of modern society. According to the report by the Expert Group on Science Education to the European Commission, "Science Education for Responsible Citizenship", we must find the most effective ways to nurture the curiosity and cognitive resources of children, better equip future researchers and other actors with the necessary knowledge, motivation and sense of societal responsibility to participate actively in the innovation process (Hazelkorn et al., 2015, p. 6). The COVID-19 crisis, the biggest global challenge the world is facing in modern times, has significantly exacerbated this issue and prompted the search for an effective solution to the problem of scholarly communication among gifted students from different countries.

Manuscript received May 5, 2022
Manuscript revised May 20, 2022
https://doi.org/10.22937/IJCSNS.2022.22.5.93

Research Focus

The idea to launch a student electronic journal has come up during the discussion, "Open Access to Scholarly Information: Pros and Cons", held via Zoom under the program of cooperation between the Institute of Gifted Child of Ukraine's NAES and the JASU students and educators. The decision to organize a discussion has been made based on the interest in this topic shared by all the participants. This scientific meeting enabled all the participants to outline their views of the problem in the context of an emerging knowledge society and helped students realize the value of open scholarly communication for the intellectual exchange of research outcomes by students from different countries. The participants of the meeting have made a joint decision to evaluate the relevance of establishing an open scientific information environment at the JASU by launching an open-access student scholarly e-journal for scientific communication and sharing research results by the JASU students.

Research Methodology

Students aged 14-17 from various regional branches of the JASU, namely Kyiv, Poltava, and Zakarpattia, were invited to take part in the survey. To obtain more reliable data, it has been decided to recruit students from different scientific departments and sections. The overview of survey participants is given in Fig. 1.

Figure 1 *Tabulated overview of survey participants*

Specialization	**Gender**	**Regional Territorial Branch**					
		Kyiv		**Poltava**		**Zakarpattia**	
		Quantity	Total	Quantity	Total	Quantity	Total
Social Sciences	Boys	11	19	3	7	1	4
	Girls	8		4		3	
Humanities	Boys	11	23	3	8	2	7
	Girls	12		5		5	
Natural Sciences	Boys	10	21	3	7	3	8
	Girls	11		4		5	
Physics, Mathematics and Engineering	Boys	11	22	4	9	2	6
	Girls	11		5		4	
Subtotal			85		31		25
Total		**141**					

As seen from Fig. 1, the survey included 85 students (43 boys and 42 girls) of Kyiv Regional Territorial Branch of the JASU, 31 students (13 boys and 18 girls) of Poltava Territorial Branch, and 25 students (8 boys and 17 girls) of Zakarpattia Territorial Branch. The higher participation rate of the Kyiv Regional Territorial Branch may be explained by the larger total number of students studying in this branch, as well as a much wider range of sections available therein. Therefore, the authors hold the opinion that this imbalance shall not affect the quality of the survey results.

Ethical Considerations

The interview procedure used in this survey complied with all applicable requirements. The researchers focused on the JASU students. Before the survey, all the students were made aware of its purpose and tasks, and notified that all data collected during the survey will remain confidential. Therefore, the survey was conducted exclusively on a voluntary basis among students interested in this issue.

Role of Researchers

To avoid any interference and give students the freedom of choice, the researchers put aside their own emotions and preferences, personal assumptions, and prejudices. The role of researchers was to collect and analyze data.

Instruments and Procedures

As a diagnostic tool, the authors have used a set of tests comprising 10 questions, which was developed on the SurveyMonkey platform. When formulating the questions, the psychophysical characteristics of 14-17-year-old students were taken into account because at that age of late adolescence – early adulthood transition the individuals experience significant changes associated with socialization, choice of life trajectory, and future profession (Khavula, 2015). During this period, a new motivational frame of learning is formed, with prevailing motives of personal

identity and preparation for independent living, which increases the interest of high school students and encourages them to develop a conscious and positive attitude to learning, which is seen by them as an essential basis for their future professional activity, while students' self-awareness ensures their conscious and critical attitude to themselves. The communication need and the desire to be aware of the various events taking place in the world become essential for the students at this age. The students' cognitive interests expand and become stable, effective, selective, and individualized, and their link to life plans and professional intentions strengthens significantly (Titov, 2018). Therefore, the authors concluded that the JASU students had a conscious interest in the establishment of an open scientific environment through the launch of a student scholarly e-journal for sharing scientific information and publishing research results and expressed a clear desire to participate in this study.

Data Analysis

The number of survey participants was 141. Answering the questions of the first test, *What web resources and/or sites are you most interested in?*, the majority of the respondents mentioned social media (56%) and information resources (39.22%). Preferences to self-educational content and news gave 51.22% and 43.9% of the surveyed, respectively.

As to the content which was the most frequently searched for by high school students on the Internet, the responses distributed as follows: 51.22% searched for self-educational content, 43.9% - for news, 34.15% - video, 39.02% of respondent expressed interest in outstanding scientific discoveries and inventions of the humanity, 32.48% liked memes and funny pictures, and 24.39% of respondents enjoyed other content. This breakdown of responses testifies to the degree of importance of social and personal self-determination for high school students, which is manifested through their theoretical and scientific worldview and is one of the indicators confirming the importance and relevance of creating an open scientific and information space for scholarly communication among young students. The launch of such a journal will help high school students to realize themselves as members of the scientific community and train them to solve the main tasks of self-development aimed at finding their place in the adult world and choosing a profession. All the above mentioned explains the interest and overall positive attitude of high school students (51.22% answered *"yes"*, and 29.27% answered *"maybe"*) to the idea of launching an open-access student e-journal and their desire to engage in this process. Although 9.76% of respondents said that they were uncertain about the answer, explanations of the reasons for their uncertainty were as follows: a) concerns about the lack of time for a new activity (3.46%); b) desire to learn more about open access publishing and then make a conscious choice (6.3%).

The next question aimed to identify the "roles" the students preferred to fulfill in the journal's editorial team. The analysis of the results revealed that the largest number of respondents wanted to take on a role of a correspondent, i.e. engage in writing articles (36.6%), a deputy editor (24.4%), and an editor-in-chief (21.95%). Some students were ready to perform the functions of a reviewer (19.51%), a section editor, or a literary editor (each 9.76%). The survey also showed some "bottlenecks": students were least interested in the roles of a site administrator (8.2%) and a text editor (7.32%), although these very activities provide an opportunity to master journal systems operating skills. None of the respondents wanted to be a proofreader. The reasons for a relatively low interest, if any (as in the case of a proofreader), in certain "roles" were identified during the next survey. The respondents explained their choice by a) conscious selection of their "role" at the journal editorial team (51.2%); b) low awareness of the specifics of certain types of professional activity (21.4%); c) lack of creative aspect in these activities (7.8%); d) lack of practical skills in these areas (6.6%). The rest of the students confined themselves to phrases like "*I don't know*", "*I'm not interested*", or "*I can't explain*". Against this general background, interesting thoughts on that subject matter with elements of reflection and self-assessment stood out: "*Unfortunately, I cannot select any specific role now. My choice is driven by the thirst for knowledge within different roles, whereupon I can choose an activity, which would be the most appropriate, interesting, and efficient for me*".

In terms of willingness/unwillingness to take on a role of an author of articles, the responses were distributed as follows: 17.07% replied "*Yes, it is really interesting*", 24.39% – "*I have no experience, but would try*"; 19.51% – "*Yes, but under certain conditions*"; 17.07% – "*I want, but I am not sure*", 17.07% – "*Maybe*", and 12.2% gave negative answers. The subsequent survey helped to determine the reasons for the lack of desire or uncertainty and hesitation of respondents in providing answers to this question. They explained their choice by a) lack of experience in writing articles (9.6%); b) significant complexity and responsibility of the author's role (4.8%); c) commitment to exact sciences (2.6%); and the rest of the students replied "*Other reasons*". Among such similar answers, the following statement appeared conscious and prudent: "*At first, I want to evaluate my abilities, but it is worth trying – I find this experience useful for myself*".

We think that one of the ways to overcome these difficulties may be raising the awareness of potential publishing workflow participants on the following: 1) the relevance and importance of each "role"; 2) the positive features of all activities. At the same time, it is possible to attract experts or educators of the Junior Academy of Sciences of Ukraine for the fulfillment of purely "routine

roles" (a proofreader, a makeup editor, a technical secretary) in the student journal publishing workflow.

The following answers were given to the question about the most interesting subject areas for high school students, which can be represented in the student journal: a) architecture, art, and design – 65.85%; b) scientific discoveries – 36.59%; c) man and nature – 26.83%; d) technologies and engineering – 24.39%; e) social sciences – 14.63%; f) other areas – 21.95%.

Thus, the survey enabled us: 1) to evaluate the degree of students' interest in the launch of an open-access student e-journal and their desire to participate; 2) to identify information inquiries and research interests of potential readers of the future journal; 3) to determine the content issues, the ratio of textual and illustrative components; 4) to initiate the development of the procedure for creating an open-access student e-journal within the framework of cooperation of the JASU research and teaching staff and the student audience.

Research Results

The quantitative and qualitative analysis of scattered and invariant information in terms of its structure and content allowed us to propose a definition for the key concept of this research. In particular, by the term "scholarly communication" in the digital age, we shall mean the dissemination of scientific information (knowledge, ideas, research results, etc.) and its exchange between scientists and experts in various fields. Such exchange is warranted through specialized electronic scholarly communication channels by providing free access to full-text publications for the disclosure of research results to all stakeholders.

Based on the constructive analysis of publicly available information, we have singled out three conventional publishing models among the existing journals of young researchers:

1) "Model of great students' autonomy" in the publishing process. An example of such a model is the international scientific journal *Young Scientists Journal* (https://ysjournal.com/). Its articles are written, reviewed, and prepared for publishing by schoolchildren aged 12 - 20 years. The Editorial Team (https://ysjournal.com/meet-the-team/) consists entirely of students, but, as an exception, the Journal engages students or postgraduate students of higher education institutions. The Editorial Team is overseen by the Scientific Board (https://ysjournal.com/the-board/) – a group of adults that helps with legal issues of the Journal publishing and promotes its long-term interests.

2) "Hybrid model", in which the students' initiatives related to the development of international scientific cooperation and communication are supported and controlled by additional councils of experienced scientists, who mainly perform a supervisory function. An example of such a model is the first peer-reviewed British *Journal of Young Investigators* (JYI). Thanks to the Journal's policy aimed at changing the situation when student research results "remain in classrooms unknown to the global audience", the joint efforts of students, future experts in various fields, and the executive board consisting of students from leading universities (https://www.jyi.org/executive-board-1) provide for a full workflow of publishing and creative scholarly communication.

3) "Active scientific support model". According to this model, the ideas of school researchers are refined and made suitable for publication by their mentors, who co-author students' research papers. This model may be exemplified by the *Young Scientist* journal (https://www.youngscientistjournal.org/). It is a product of the Vanderbilt Center for Science Outreach (Tennessee, USA), a group that is dedicated to enhancing scientific and technological literacy through the establishment of unique partnerships between Vanderbilt University scientists, K-12 educators, and the local and global science community, and promoting student research activities.

Based on the analysis of existing student scholarly publications, it was decided to use the Hybrid model for the creation of a student scholarly e-journal within the JASU. According to this model, the Scientific Board will oversee the activities of the student Editorial Team, and assist in resolving organizational, financial, and technical issues related to the launch of the student journal, participate in the establishment of the Editorial Team, support student initiatives, etc.

Thus, with the Hybrid model, the students will have an opportunity to use their potential not only as authors but also as participants of the entire publishing workflow (editors, reviewers, etc.). This model also enables to engage Ph.Ds., researchers, and post-graduate students as the members of the Scientific Board, and students of the global leading universities as co-editors. This model ensures a balance between the quality of content and the effectiveness of the space for students' professional self-determination, and preparation for their adult scientific career, and enables the development of students' business culture and interpersonal skills, and gives the students insight into the global publishing standards, etc.

It should be emphasized that the online format of such a publication will provide significant benefits and convenience at all stages of Journal development and management. The benefits of the online format for the editorial and production workflow are as follows: simplified business communication through the remote collaboration between authors, reviewers, and editors; possibility to increase the volume of the publication and number of published articles; convenience in archiving

many necessary documents. These factors help improve efficiency and productivity in general, significantly expand the range of users, and boost the rating of the publication. In addition, they enable financial savings through reducing the staff and spending no costs on printing and other related procedures.

The advantages of online format for authors and users include the universal reach of the publications, convenient access and ease of searching for the necessary information, simultaneous use of publications by an unlimited number of users, the possibility of obtaining information and analytical support for the research through indexing of published papers in scientific databases. All the above mentioned explains the growing demand for electronic research periodicals, while the rapid progress of multimedia technologies creates new prospects for their further development.

Among other e-journal systems, Open Journal Systems currently is the most widely used open-source journal publishing platform for journal management and publishing. It features a set of functions and powerful tools, which assist with every stage of the editorial and publishing workflow (PKP Public Knowledge Project Open Journal Systems). Many benefits inherent in OJS encouraged us to use this platform for the launch of an open-access student scholarly e-journal, thereby satisfying the desire of high school students for joint creative activity related to the establishment and management of the Journal. Important positive aspects of OJS include clear, well-developed documentation, easy installation, and the opportunity to quickly create a high-quality e-journal website, support multiple publications with their own assigned URL on a single platform, customize site design, introduce changes to the Journal settings, ensure support of all Journal functions by the Editorial Team, automatically archive all intermediate edited versions of submitted materials and published articles, provide multilingual interface support, fully automate the communication process between users at each stage of the editorial workflow, and expand the range of system capabilities using plugins. A flexible management system provides the efficiency of reviewing and preparing articles for publication, a quick search for the necessary materials in different categories using many search tools. All these benefits ensure automation and ease of technical tasks' performance by the Editorial Team and provide further support for the student e-publication (Spirin et al., 2017).

To create a high-quality top-rated e-journal on OJS platform, it is necessary to consider essential aspects associated with the development and implementation of an action plan targeting a specific audience. In the framework of our study, the talented and science-prone high school students – students of the JASU – for the most part act as authors, potential actors of scientific and information exchange, and "end users" of the finished product. The creation of an e-journal involves multiple stages and requires the use of computer technologies, abilities to solve analytical and applied problems through an innovative approach, which is very important for shaping the key 21st-century skills and competencies in the emerging knowledge society. According to the processes and procedures associated with the launch and management of the Journal, future work will involve the project activities (hereinafter referred to as the Project) such as design, content creation, artistic web design, and technical support.

Preparatory Stage

The Project preparatory stage starts with the establishment of an Action Group, which includes representatives of the administration office, teachers, and students of the JASU. Based on the analysis of the institution's capabilities, the Action Group outlines the required financial and technical resources, determines the need in engaging information and communication technology and publishing experts, and scientists in the Project implementation, and considers involving patrons and charitable funds to support the Journal publishing.

This stage is characterized by a significant scope of tasks: members of the Action Group study the legal framework and analytical information, develop a general concept of the contemplated journal, and a content action plan.

Organizational and Simulation Stage

Since the target audience of the e-Journal has already been determined, the Project organizational and simulation stage includes the discussion of organizational issues, building a team, and defining the duties of:

- the members of the Editorial Team (editor-in-chief, deputy editor-in-chief, members of the Editorial Review Board, executive and technical secretary);
- the editorial staff of the Journal (manager, section editors, literary editors, proofreader, makeup and content archiving editors);
- the information and communication technology specialists (site administrator, web programmer, system administrator).

This stage includes the distribution of selected "roles" with due regard to the interests and abilities of high school students who have expressed a desire to participate in the Project. To improve the student's understanding of the Project's goals, their ability to act constructively, coherently and creatively as part of a team, and give them insights into the specifics of each activity, it will be appropriate to organize and conduct preliminary events for students participating in the Project, i.e. seminars, training sessions, consultations. To lay the foundation for the development of necessary knowledge and skills, the

students are assigned to respective mentors according to the chosen field of activity. Within the framework of cooperation, the mentors help high school students to gain experience in the area that may become their profession in the future, develop competencies necessary for their further independent life. Particular attention should be given to the development of the Regulations on open-access student scholarly e-journal and its launch in line with the international and Ukrainian publishing standards. The Regulations shall define:

- the concept, namely, the type (multidisciplinary or specialized) and form of the publication (original or parallel), access mode, frequency of publication, number of languages used for the site support and submission of manuscripts, allowed formats for text, graphic or other materials;
- the purpose and range of scientific issues, system of headings, sections of the subject area;
- the Journal's policy regarding copyright compliance and authors' responsibility for the authenticity of submitted articles, prevention of plagiarism and conflicts of interest, editorial ethics, peer-reviewing, principles of articles selection, archiving, etc.

Upon the development of the Regulations, the technical tasks for a web programmer and web designer associated with the journal's functionality and design are defined.

This stage includes defining the areas of responsibility and tasks of all Project participants, the reporting procedure, etc.

Technical Stage

The procedure for creating an e-journal at the next stage includes the completion of the technical tasks: 1) creating the necessary functionality, namely: navigation systems (transitions between pages, journal content, search engines), setting up filters and categories, connecting the necessary plugins, etc.; 2) overlay design (page layout, images, animations, videos, sliders, etc.).

At this stage of the Project, the site administrator creates accounts for the members of the Journal Editorial Team and defines the levels of their access to different systems within the editorial workflow; integrates the e-Journal with the official website of the JASU; registers it in scientific and library search engines, adds statistical modules, etc.

Arrangement Stage

At the next stage, the Project participants develop instructions and guidelines for future authors and users and upload them to the Journal website; conduct training sessions for the academic staff and students of the Junior Academy of Sciences of Ukraine in order to make them aware of and organize their activities associated with a new publication.

Summarizing Stage

Subject to the successful launch of the first issue of the student e-journal, the summarizing stage shall include saving the scientific content of the Journal in the open archives and institutional repositories, developing a strategy for the journal advertising campaign among a wide readership, and supporting the publishing activity of student youth; expanding scientific content.

Consistent fulfillment of all the above tasks will ensure the quality and credibility of the future publication among a certain target audience.

Discussion

This study shows that the idea of creating a student scholarly journal at the Junior Academy of Sciences of Ukraine using the modern OJS technology is feasible and may be put into practice. Firstly, we found a significant need for the launch of such a publication for optimizing the educational activities at the JASU – the institution, which is committed to the identification, support, and development of gifted and science-prone students. International student project and research competitions organized and held by the JASU, as well as extra-curriculum training at the JASU, facilitate the development of the students' abilities to present their outputs to a wide research community, substantiate and defend their opinions. Despite many years of experience of the JASU and the active participation of talented students from all over Ukraine in scientific activities, the results of student research are published only in special, dedicated to specific competitions, collections. The time has come when the introduction of a modern open-access approach may warrant the continuity and independence of public disclosure of the scientific results achieved by JASU students, and bring this disclosure to a new international level through open publishing in English.

Secondly, the structure of the organization, which has centers in each region and branches in small towns and villages, may ensure high participation of students from different localities and social groups in the Journal launch, help unite the community of JASU students through publishing activities, and possibly create an extensive network of journals on the model of this Journal.

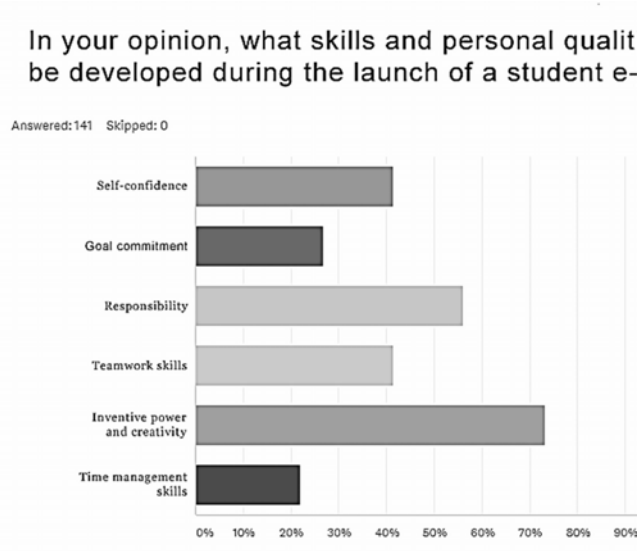
Thirdly, until recently, the JASU's educational activities were mainly focused on the formation of scholarly knowledge and knowledge of research procedures. Over the last years, however, the importance of forming in young people also the epistemic knowledge and skills of scientific interpretation and argumentation is gaining ground. The role of the research articles' author (the most widespread

role at the student journal) can contribute to the formation of the above characteristics.

In terms of the roles in the Journal publishing selected by the students, the majority of respondents preferred to be the authors of articles (36.6%). This comes up to the expectations since the JASU students are engaged in research activities and achieve results, which they want and may share with like-minded people. The fact that the lowest share of respondents expressed a desire to take on a role of a text editor (7.32%) and none of the respondents wished to be a proofreader can be explained by the somewhat "routine" nature of a proofreader and text editor duties, which, according to the respondents, almost do not involve the search for creative solutions, use of imagination, and are quite specific.

The students' considered and informed responses to survey questions demonstrated their understanding of the importance of establishing effective scholarly communication among peers from different countries through the creation of an open-access student scholarly e-journal. In particular, high school students noted "inventive power and creativity", "responsibility", "self-confidence", "teamwork skills", "goal commitment", "time management skills" as the most important skills and personal qualities which formation and development may be promoted during the creation of an e-journal.

Figure 2 *Diagram with examples of the answers to survey questions*



In the Ukrainian realia of ongoing introduction of specialized science-oriented education, the involvement of talented, science-prone students in the launch of an OJS-based student scholarly e-journal and the publishing process in general, is one of the tools to boost the internal motivation of high school students to the conscious development of scientific literacy, scientific thinking, and the formation of self-organization skills, which will help them to build a scientific career in the future (Kuzmenko & Bratus, 2020; Kuzmenko & Bratus, 2021).

Nowadays, the importance of open access is widely recognized. An essential obstacle to global open access is not resistance but inertia stemming from an outdated tradition, which inhibits its promotion. However, it is impossible to overestimate the importance of open access for developing countries. It is a chance to participate in the worldwide project of research on a level playing field. A route into the academic world for impoverished but motivated students. Immediate access to crucial medical advances. A path towards research that's targeted to these nation's issues (Poynder, 2013). This is especially relevant for Ukraine during the introduction of innovative research practices when domestic scientists reconsider the global experience of science education (Halchenko, 2017; Kovalova, 2020) and strive for integration into the global innovative educational context. It is scholarly communication through open access journals that is becoming a key element of open science and international cooperation for sustainable development.

Conclusions and Implications

This paper has clearly shown that the idea to launch an open-access student scholarly e-journal as a progressive innovative practice at the JASU aimed to ensure scholarly communication of students from different countries is a timely and relevant initiative. It has been demonstrated that the launch of the journal, in which 14-17-year-old students of scientific sections of extracurricular institution act mostly as authors, potential actors of scientific information exchange, and "end users" of the finished product, i.e. the target audience, meets their interests. As seen from the students' answers to survey questions, the vast majority expressed a desire to take part in the Journal launch Project (51.22% of respondents said "yes", 29.27% – "maybe"). We consider the desire of high school students to participate in the joint launch of such a publication to be conscious and fully justified. Since at the age of 14-17 (late adolescence – early adulthood transition), the individuals acquire the ability to search for the goals and meaning of existence and identify their life trajectories, which enable students to consciously determine their needs and abilities, position themselves in social and labor relations.

It has been found that OJS platform suits perfectly the idea of student journal launch. OJS features a set of functionalities and powerful tools for managing the editorial and publishing workflow at all stages, which both simplifies the technical tasks of the Editorial Team and provides further support for the publication, the main creators of which will be students.

The practical implications of this research include the choice of the appropriate publishing model, development of the procedure and content of the stages for creating and maintaining the open-access student e-journal within the framework of creative collaboration between the JASU's teaching staff and students. The main stages are namely the preparatory, organizational and simulation, technical, arrangement, and summarizing.

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