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ORIGINAL ARTICLE

Student Scientific Group Technology and Science and Experiences in scientific dissemination

Grupo Científico Estudiantil Tecnología y Ciencia. Experiencias en la divulgación científica

Grupo Científico de Estudantes de Tecnologia e Ciências. Experiências em divulgação científica

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ABSTRACT

Introduction: scientific dissemination should not be seen only as an activity of the communication or journalism professional. Knowing how to disseminate scientific research is a form of management of acquired knowledge. **Objective:** to describe the experiences in scientific dissemination of the Student Scientific Group: Technology and Science. **Method:** an observational, descriptive and cross-sectional study was carried out. During the period October 2020 May 2023, at the University of Medical Sciences of Cienfuegos, Cuba. The information was compiled from the analysis of the GCE's work evidence. The experiences were described taking into account the actions, activities and spaces created for the development of scientific dissemination. **Results:** the GCE is made up of 14 students from different careers in medical sciences. Of them: seven are medical students, two belong to Stomatology, three to Health Technologies, and two to the Nursing career. Regarding sex, 57% are male and 43% female. The systematic work with the GCE has allowed for considerable progress in terms of organization and development of events where scientific results are socialized and disseminated, and the sustainability of teamwork has allowed the contributions derived from the results to be published in scientific journals. **Conclusions:** the work of the GCE: Technology and Science plays a decisive role in the university community, as it organizes scientific and academic activities in order to increase student scientific development.

Keywords: scientific dissemination; student scientific group; scientific activity

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RESUMEN

Introducción: la divulgación científica no debe verse solo como una actividad propia del profesional de la comunicación o del periodismo. Saber divulgar una investigación científica es una forma de gestión del conocimiento adquirido. **Objetivo:** describir las experiencias en la divulgación científica del Grupo Científico Estudiantil Tecnología y Ciencia. **Método:** se realizó un estudio observacional, descriptivo y transversal. Durante el período comprendido de octubre de 2020 a mayo de 2023 en la Universidad de Ciencias Médicas de Cienfuegos, Cuba. La información se recopiló a partir del análisis de las evidencias de trabajo del Grupo Científico Estudiantil. Las experiencias se describieron teniendo en cuenta las acciones, actividades y espacios creados para el desarrollo de la divulgación científica**. Resultados:** el Grupo Científico Estudiantil está integrado por 14 estudiantes de las diferentes carreras de las ciencias médicas. De ellos: 7 son estudiantes de Medicina, 2 pertenecen a Estomatología, 3 a las Tecnologías de la Salud y 2 a la carrera de Enfermería. En cuanto al sexo el 57% son masculinos y el 43% femeninos. El trabajo sistemático con el Grupo Científico Estudiantil ha permitido avanzar considerablemente en cuanto a organización y desarrollo de eventos donde se socializan y divulgan resultados científicos, además la sostenibilidad del trabajo en equipo ha permitido que se publiquen en revistas científicas los aportes que se derivan de los resultados. **Conclusiones:** el trabajo del Grupo Científico Estudiantil Tecnología y Ciencia juega un papel decisivo en la comunidad universitaria, pues organiza actividades científicas y académicas en aras de incrementar el desarrollo científico estudiantil.

Palabras clave: divulgación científica; grupo científico estudiantil; actividad científica; actividad científica

RESUMO

Introdução: a divulgação científica não deve ser vista apenas como uma atividade do profissional de comunicação ou jornalismo. Saber divulgar pesquisas científicas é uma forma de gestão do conhecimento adquirido. **Objetivo:** descrever as experiências de divulgação científica do Grupo Científico de Estudantes de Tecnologia e Ciências. **Método:** foi realizado estudo observacional, descritivo e transversal. Durante o período de outubro de 2020 a maio de 2023 na Universidad de Cieências Médicas de Cienfuegos, Cuba. As informações foram compiladas a partir da análise das evidências de trabalho do Grupo Científico Estudantil. As experiências foram descritas levando em consideração as ações, atividades e espaços criados para o desenvolvimento da divulgação científica. **Resultados:** o Grupo Científico Estudantil é composto por 14 estudantes de diferentes carreiras das ciências médicas. Destes: 7 são estudantes de Medicina, 2 pertencem à Estomatologia, 3 às Tecnologias da Saúde e 2 à carreira de Enfermagem. Quanto ao sexo, 57% são homens e 43% mulheres. O trabalho sistemático com o Grupo Científico de Estudantes tem permitido avanços consideráveis em termos de organização e desenvolvimento de eventos onde os resultados científicos são socializados e divulgados, além disso a sustentabilidade do trabalho em equipe tem permitido que as contribuições derivadas dos estudos sejam publicadas em revistas científicas. **Conclusões:** a atuação do Grupo Científico de Estudantes de Tecnologia e Ciências desempenha um papel decisivo na comunidade universitária, pois organiza atividades científicas e acadêmicas com o objetivo de aumentar o desenvolvimento científico dos estudantes.

Palavras-chave: divulgação científica; grupo científico estudantil; atividade científica; atividade científica

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INTRODUCTION

Science is in fact a hidden part of contemporary culture, a phenomenon that must be corrected as a matter of urgency. A good way to contribute to this is the realization of a correct and wide popularization of science. With science, man has found an effective way of knowing the universe and some ways of modifying it and making better use of it.

The development and use of Information and Communication Technologies (ICT) has allowed the improvement and diversification of the form, management and presentation of research. Digital technologies facilitate new forms of learning, understanding and dissemination, which are required to implement the complex solutions needed for sustainable development.[1]

Currently, working with young people plays an important role in scientific and technical development. In this sense, the space of Student Scientific Activity (SSA) stands out from the university environment. According to Machado, et al.[2] this contributes to the formation of skills and habits of technical-research work in students, through the search for answers to scientific problems of increasing complexity, with the use of the scientific method and under the guidance of a teacher.

The (SSA) stands out for the important role it plays in the scientific development of the university institution. The Student Scientific Groups (SSG) arise and are created from it, according to the lines of research. These are responsible for the scientific training of their members, in addition to the development of strategies and work actions to contribute to the scientific dissemination of the results of their research.[3,4,5]

A contributing factor for the visibility of scientific activity to mankind is scientific dissemination. This can have various forms of presentation, so it is necessary to provide young researchers with the sources, tools and services of specialized scientific information, which allow them to continue a research process parallel to contemporaneity. Encouraging scientific dissemination actions in students during the development of their research projects favours their future scientific activity.

Scientific dissemination should not be seen only as an activity of the communication or journalism professional. Knowing how to disseminate scientific research is a form of management of the knowledge acquired and is a responsibility of all those who do research, because it contributes to the democratization of knowledge, to feed back pre-existing inequalities or to communicate results to the community formed by specialists in the field.

The SSG Technology and Science (TECNOCIEN) was created in 2020 and is composed of students from different careers in the medical sciences and directed from the Provincial Center of Scientific Information of Medical Sciences of Cienfuegos (CPICM). Since its creation and conception, the fundamental contribution of the SSG has been to guarantee the provision of scientific-technological information services to health professionals, the dissemination of scientific research results and the promotion of solutions and services that contribute to face health problems, as well as to the development and achievement of several Sustainable Development Goals in our environment.

METHOD

An observational, descriptive and cross-sectional study was conducted during the period from October 2020 to May 2023 at the Medical Sciences University of Cienfuegos, Cuba.

The information was collected from the analysis of the SSG work evidences. The experiences were described taking into account the actions, activities and spaces created for the development of scientific dissemination, which are considered variables of the study.

Ethical norms and considerations were respected and considered.

RESULTS

The SSG is composed of 14 students from different careers in the medical sciences. Of these: 7 are medical students, 2 belong to Stomatology, 3 to Health Technologies, and 2 to Nursing. In terms of gender, 57% are male and 43% female.

During this stage, there have been several experiences of the SSG linked to scientific dissemination, since its creation, the different and varied ways in which it can be developed have been worked with the members; that are partly conditioned by the creativity and the importance that the researcher gives to his scientific result.

The following are the experiences of the work of the SSG for the development of scientific dissemination:

Description

- ✓ Scientific workshop: Scientific dissemination: a necessary space in contemporary times.
- ✓ Training in the use of interactive virtual platforms for the development of scientific events, mainly using the Open Conference System (OCS) platform.
- ✓ Course on Research Methodology and Writing of scientific articles.
- ✓ Support and advice from members of the SSG to the provincial chapters of the specialties on how to operate the platform on which their scientific events were developed.
- ✓ Training course on digital social networks (Facebook, Whatsapp, Telegram, Twitter) as ways to disseminate science.
- ✓ Indexing of the INMEDSUR student scientific journal in prestigious national and international databases.
- ✓ Joint work with developers and programmers of the Department of Technology and Development of the Provincial Center of Medical Sciences Information of Cienfuegos in the creation of the App Covid-19-InfoCu. App created as a mechanism of communication and information to the Cuban population about COVID-19 and the students had the task of searching for scientific information in the specialized sites of the Cuban health system.
- ✓ Jornada Virtual de Publicación Científica Estudiantil (PubliSur), held every two years.

- ✓ Television program: DIVULCIEN.
- ✓ Scientific Evening: Connect with Science.
- ✓ Refresher courses on topics of interest and pre-event sessions through digital social networks. In this case, the courses developed through the Telegram channel stood out with greater participation (https://t.me/cursoscovidcien).

These courses were attended by students, teachers and the general population. They were disseminated through the official digital pages and the mass media (radio and television spots).

Courses taught

Course 1: Post-COVID-19 syndrome.
Course 2: Pandemic fatigue caused by COVID-19: How to face it?
Course 3: Haematological alterations in patients with COVID-19
Course 4: Happy hypoxia, silent killer
Course 5: Association between periodontal disease and COVID-19
Course 6: COVID-19 genetic variants
Course 7: Sexuality and COVID-19.
Course 8: Use of acupuncture in dealing with COVID-19
Course 9: The use of convalescent plasma as a potential treatment in patients with COVID-19
Course 10: Pancreatic implications of COVID-19
Course 11: Use of ozone therapy in the treatment of COVID-19
Course 12: Semiology of COVID-19: What do we know about it?

The systematic work with the SSE has allowed considerable progress in terms of organization and development of events where scientific results are socialized and disseminated, and the sustainability of the teamwork has allowed the contributions derived from the results to be published in scientific journals.

Table 1 shows the results of the contributions of the SSG Technology and Science that have been published in several scientific journals.

Table 1. Articles published by GCETechnology and Science

Article	Magazine	Year	Indexing databases
First National Virtual Scientific Conference on COVID-19 and National Virtual Symposium on care of critically ill patients with COVID-19: spaces for the exchange of knowledge.	Medisur	2021	SciELO, Emerging Sources Citation Index
Covid-19-InfoCu: mobile application to inform and guide about the pandemic caused by SARS COV 2.	Cuban Journal of Medical Informatics	2021	SciELO
Characterization of original research presented at the First National Scientific Conference on COVID-19, CovidCien2021.	Medisur	2022	SciELO, Emerging Sources Citation Index
Technological alternatives to face COVID-19 in Cuba.	Cuban Journal of Health Sciences Information	2022	Scopus
Transforming Scientific Events with Information Management: The Case of the Virtual Health Convention Center.	Data and Metadata	2022	Scopus
Use of the Virtual Health Classroom by Cuban students of medical sciences.	April 16 Journal	2023	Latindex, DOAJ
Virtual courses as spaces for knowledge exchange.	Journal of Medical Sciences of Pinar del Río	2023	SciELO

Source: SSG Technology and Science database.

DISCUSSION

Scientific popularization has been present throughout the history of mankind. The generation of knowledge, its transmission, appropriation and social use have been the key link in the evolution and transformation of societies. Humanity has succeeded in developing a rigorous method capable of systematizing all this knowledge and applying it to solve problems.[6]

Disseminating science promotes curiosity, helps to understand the transformations occurring in society, provides information so that people can form their own opinion and participate in issues associated with the progress of science. In other words, it favours the participation of information channels at the service of society.[7] Scientific dissemination of scientific advances to the general public allows a greater and better appropriation of knowledge. In this way, it provides them with information to support such advances and to understand what is being researched, so that disseminating science is to bring it closer to the general public.

There are several ways and means by which scientific dissemination can be achieved, among them are publications, conferences, events, audiences and scientific development and innovation activities. Mayorga, et al.[8] state that the contemporary university should generate a link with society, in order to keep it informed of the dizzying advances in the field of science, technology and innovation.

The SSG plans the scientific dissemination activities to be carried out each month, which allows the correct execution of these activities, among which those linked to social networks stand out. According to Porcelli,[9] social networks and virtual spaces are mechanisms of interaction, communication channels, but with a much greater reach and impact than any of the other traditional media, and with a greater capacity for interaction and dynamism than any of the other media.

Currently, according to Alonso,et al.[10] researchers who want to carry out scientific dissemination are in a process of adaptation to the digital environment. The transition is uneven, depending on age, research experience, gender or their predisposition. Hence, the importance of working with young people from the beginning of their student life on how to disseminate their scientific results from different alternatives such as: scientific digital social networks, scientific events, scientific journals and mass media.

The SSE has among its work objectives the search for updated tools that allow scientific dissemination to different contexts and audiences. Currently, there is a generalized trend towards the consumption, use and constant use of social networks in the distribution of scientific news. The members of the SSG preferred the use of Telegram and Whatsapp, which coincides with the research conducted by Pérez-Cruz,et al.[11] where students recognize that Whatsapp is a useful tool, both academically and in everyday life. However, in the study conducted by Martín, et al.[12] Instagram turned out to be the favourite application of Chilean communicators when communicating the institutional and scientific message they wish to publish.

The authors agree with Tarango, et al.[13] who state that currently, the challenges to be faced in the generation, dissemination and communication of knowledge, both educational and research, are characterized by promoting critical thinking, the use of new technologies and forms of collaborative work. The SSG encourages the search for and presentation of alternatives and ways to promote scientific dissemination as a necessity for the visibility of the scientific results of research.

Encouraging students to reflect on real issues that have an impact on the way they act in society, provides them with an integrating vision and not an individualistic vision. The active search for actions that inspire changes and positive transformations of the new generations in society is vital given the importance of educating from sustainability and sustainability and in this sense it is important to popularize science.[14]

CONCLUSIONS

The work of the Technology and Science Student Science Group plays a decisive role in the university community, since it organizes scientific and academic activities in order to increase student scientific development. The experiences of the work of the Student Science Group in scientific dissemination highlight the work of the group in search of solutions and alternatives in the development of information management skills. The students showed acceptance of the dissemination of the scientific contents generated as a result of the research.

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The authors declare that there are no conflicts of interest.

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Yuleydi Alcaide Guardado: conceptualization, data curation, formal analysis, research, methodology, supervision, writing-original draft, writing-revising and editing.
Mabel Rocha Vázquez: conceptualization, data curation, formal analysis, research, methodology, original drafting, drafting-revising and editing.
Luis Enrique Jiménez-Franco: conceptualization, formal analysis, research, visualization, *Writing-original draft:*.
Claudia Díaz de la Rosa: conceptualization, formal analysis, research, visualization, original draft-writing, *Writing-review and editing*. Enrique Acosta Figueredo: formal analysis, research, writing-original draft.
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