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Experience Report

Poster as a teaching-learning strategy to encourage the scientific career of undergraduate students

Pôster como estratégia de ensino-aprendizagem para o incentivo a carreira científica de estudantes de graduação

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ABSTRACT: An evaluation of the Brazilian Ministry of Education showed that one of the problems of the teaching-learning process of a medical course was the lack of stimulation for participation in scientific events. This article reports the experience of using posters and writing experience reports as a strategy to overcome the limitation pointed out. The teaching method used to develop this experience was the Arch de Maguerez. In the context of a collective health teaching module, students were encouraged to develop scientific posters to present the activities developed in health units during the semester. During this semester, each group developed three posters, each with specific objectives. Poster presentations and evaluations were carried out in the classroom and difficulties were identified. Appreciative feedback and peer review were carried out and made possible the improvement of the posters and overcoming difficulties throughout the presentations. The experience reported in this work proved to be effective for the development of competences related to academic and scientific development, is inexpensive and can be replicated in any academic course.

Descriptors: Education; Medicine; Education, medical, undergraduate; Poster; Teaching materials.

RESUMO: Uma avaliação do Ministério da Educação do Brasil mostrou que um dos problemas do processo ensino-aprendizagem de um curso de medicina era a falta de estímulo para a participação em eventos científicos. Este artigo relata a experiência da utilização de pôsteres e da redação de relatos de experiência como estratégia para superar a limitação apontada. O método de ensino utilizado para desenvolver esta experiência foi o Arco de Maguerez. No âmbito de um componente curricular de Saúde Coletiva, os alunos foram incentivados a desenvolver pôsteres científicos para apresentar as atividades desenvolvidas nas Unidades de Saúde ao longo do semestre. Nesse período, cada grupo desenvolveu três pôsteres, cada um com objetivos específicos. Foram realizadas apresentações e avaliações de posters em sala de aula e as dificuldades identificadas. Realizaram-se feedbacks apreciativos e revisão por pares que possibilitaram o aprimoramento dos pôsteres e a superação de dificuldades ao longo das apresentações. A experiência relatada neste trabalho mostrou-se eficaz para o desenvolvimento de competências relacionadas ao desenvolvimento acadêmico e científico, tem baixo custo e pode ser replicada em qualquer curso acadêmico.

Descritores: Educação; Medicina; Educação de graduação em medicina; Pôster; Materiais de ensino.

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INTRODUCTION

In a medical course at a Public Higher Education Institution (HEI) in the State of Minas Gerais, Brazil, an evaluation of the Ministry of Education in the early 2000s showed that one of the biggest difficulties of the teaching-learning process was the lack of incentive and encouragement for students to participate in scientific events. This scenario generated academic discouragement in the search for production of knowledge and participation in academic research[1]. We realized that the Pedagogical Course Project (PCP), updated in 2013, promoted extracurricular activities as a way of complementing the curriculum and gaining experience for students[1]. This allows for greater professional knowledge and overcoming institutional difficulties, since students are stimulated to develop critical and resolutive skills.

Thus, in view of the demands of this new PCP, we needed to find a way to prepare and encourage students to academic and scientific production. We needed a teaching-learning strategy capable of developing in students an interest in quality academic production and, at the same time, enabling them to act in the systematization and dissemination of experiences and academic research. We found some answers to our problem in the National Curricular Guidelines (NCG) of the Undergraduate Medicine Course[2]. According to this document, medical graduation should be based on a general humanistic, reflexive, critical and ethical education. Such education, in view of Brazilian constitutional precepts, focuses on the care centered on the person understood as a historical and social individual, perceived in its integrality and active in its vital processes.

The professional who intends to develop must be able to act in the different levels of health care, in individual and collective care, through promotion, prevention, rehabilitation and recovery of health, considering in a relevant way the different social determinations. Teaching should focus on the student, who must have an active, autonomous, and curious stance for knowledge, and the teacher should facilitate this process. In this sense, one of the focuses of the NCG is the development of verbal and nonverbal communication skills as a tool for construction of the doctor-patient-family relationship and the possibility of greater patient understanding, autonomy and safety in therapeutic design[2]. For this, communication resources such as the new information and communication technologies (ICT) have been used, which in addition to access to databases and informational interaction at distance, favor the development of skills that help physicians to communicate better with users. In addition, students must know scientific methodologies that enable the adequate search for qualified information and participation in the production of scientific knowledge. For this, it is fundamental to create spaces and conditions for the development of research, including from experiences in the practical study scenarios.

METHODS

Thus, we offer in a curricular component the learning-process about the use of posters and writing experience reports as a strategy to overcome that challenge of evaluating the mentioned course. Taking advantage of the context of the curricular reform and the need to integrate several expertise, we inserted the learning-process about making academic posters in a curricular component of Public Health, in which students performed interventions in primary health care services and their respective communities. Thus, we expected to systematize relevant and efficient actions for the construction of integral health care.

The use of poster was chosen because it is considered the most common, effective, and dynamic presentation in scientific events around the world and allows a dynamic and rapid assessment of the audience and this format of academic presentation is appropriated to discuss, interact, and propose suggestions[3]. It also stimulates exchanges of ideas and problem-solving interactions, as well as allowing better appreciation and understanding of the public. Peer evaluation encourages discussion and feedback and favors the student's development as an agent of their training and performance[4,5].

Subsequently, the actions developed would be presented to classmates and professors, community and health professionals who participated in the process through digital posters in the model of experience reporting, in a simulation of a scientific event. There would be a peer evaluation of the works presented[4], which together with the preparation and presentation of posters would favor the development of criticality and communication skills.

Thus, this article seeks to relate this experience and to discuss the potentialities and difficulties encountered by an academic group and its professors during the construction of this strategy. Because it is not exclusive competences for medical training, we believe that this experience can be replicated in formations in other areas of knowledge.

RESULTS AND DISCUSSION

The content learned during the third semester of Public Health curricular component brought concepts and themes that allowed a fundamental increase in human and critical formation, focused on reality and integral attention to the person. The theoretical activities of this curricular component were very interconnected and articulated with the practice applied in primary health care services. The experiences carried out in these spaces allowed the application of concepts of health promotion and prevention,

which were the essence of this process and enabled the search for overcoming the exclusively medical-curative assistance.

Thus, this article was based on the authors' experience report based on the theoretical and practical in third semester activities of Public Health, a compulsory curricular component with the aim of developing skills in the field of health promotion, prevention of and health education, focusing on the role of governmental programs such as Family Health Strategy[6] and Popular Education in Health[7].

The teaching-learning method used in this process was the arch of Charles Maguerez, which aims examining and questioning of the cases and situations[8]. This method comprises five stages that are developed from a selection of part of the reality and follow with the observation and identification of the problem, the key points, theorization, the hypotheses of solution and the application to reality.

The focus of the contents was on the experience of illness, meaning and metaphors used by those who experience and on the organize of an operative group based on principles of Popular Education in Health, a method that breaks with the vertical relationship between health professional and patient. The posters were used as a teaching-learning strategy capable of systematizing the stages covered and problematize it, as well as the dissemination of the products resulting from this intervention performed with health services and communities.

The systematization and assimilation of such content facilitated the effective participation of students in the health-illness-care process of the users of the Brazilian Unified Health System (*Sistema Único de Saúde*, as known as SUS), in addition to enabling an active search of community needs and its subsequent application to reality through the operational groups. This is in line with the principles guided by the National Policy on Popular Health Education[7] (*Política Nacional de Educação Popular em Saúde*, as known as PNEPS) within SUS: dialogue, amorousness, problematization, shared construction of knowledge, emancipation, and commitment to the construction of a democratic and popular project[9].

During the execution of the curricular component reported here, a learning environment was built for the students' humanist and critical development, to develop their interest in integral health care and to create a resolutive stance within the scenarios in which we are inserted. Another fundamental aspect of students' training is the development of interest in scientific research at the University, aiming at the progress of science in the environment in which we live and the use of alternative communication technologies to facilitate the dissemination of what has been learned and studied.

To start the first stage of the Arch of Maguerez it was requested that the class should be divided into 26 pairs and each one would go to a different primary care service. There they would carry out the proposed activities in class. In this context, it was suggested by the professors the construction of scientific posters that would bring a critical synthesis of the activities performed in primary health care services together with the content studied during the semester. Thus, throughout the semester in the Public Health module, three posters were developed for each pair, based on experiences in health services, with the aim of synthesizing and reproducing in a more dynamic way what was worked out with the health and community.

The first poster was intended to present the first experience in this scenario, and it was systematized in introduction, objectives, methodology, development, conclusion, and references. Hence, it was necessary and possible to make a broad and direct retrospective of the experience, within the required parameters, such as number of characters and adequate sources. The plurality of subjects that each pair studied allowed a variety of posters with different subjects and directions, enabling a wide diversity. The presentation of the posters took place in the classroom, in digital form and, as it is done in congresses and similar activities, a specific time for the exhibition was determined. As it was a first experience with the writing and exposition of the posters, we observed a certain difficulty in the synthesis of the content, in the search for references and in the adequacy of the speeches to the short time of the presentations. The pressure of a stopwatch and the nervousness of the presentation made it difficult for several students who had not experienced such experience before.

The second posters were made based on a more specific experience in the services and allowed an improvement in their writing. With a little more experience and with the appreciative feedback made by the professors in the first poster, we were able to perceive the previous mistakes and construct the posters with better elaborated topics, bigger and better quantity of content, language facilitator for the understanding, adequate synthesis and references diversified and appropriate to the subject.

This time there was no verbal presentation, and the correction was done by the pairs, when two other students corrected the posters of another pair and pointed out the mistakes made, as well as positive and negative points. On this subject, Nassi-Calò[10] states that:

> Peer review is particularly important for young early-stage researchers, as it enables peer reviewers to develop methodological and writing skills, synthesis power, and critical judgment, resulting in a virtuous circle that forms better authors (p. 1).

The peer review system[11,12] should be based on the academic-scientific-technological merit of the researcher or course and use qualitative criteria, although it is assumed that quantitative criteria will be used in the alternative. This methodology transforms the purely objective correction

into something collaborative and constructive, so that there is a sharing of knowledge, expertise, and ideas, as well as encouraging mutual help and trust among students.

There is also encouragement to develop meaningful learning and strategies for proper feedback and teamwork. The peer evaluation experience was fundamental by allowing the development of a critical view. In general, the theoretical elements evaluated in these posters were header, introduction, objectives, methodology, results, conclusions, and references.

These two activities were formative and summative, because supporting the feedback of other students and teachers for qualifying knowledge about the construction of the posters and favoring an external critical view that contributed actively to the improvement of the adjustments in the work.

The last posters combined all the skills acquired with the writing of the previous ones and made possible its full construction. In the third and final presentation, the posters were printed and fixed in classroom so that everyone could be seen and accompanied by colleagues and professors, as well as in academic and scientific conferences. Groups of presenters, evaluators (professors) and colleagues were divided. After the presentation, there was immediate appreciative feedback from the evaluating professors and colleagues in the group who also followed the performance.

Up to that point, seminars had been prevalent in our classroom communication experience. This modality fails to determine the horizontal development of knowledge, without allowing the joint construction of expertise and the use of synthesis in speech. The NCG[2], on the other hand, incorporated the importance developing communication abilities and the performance of action in an effective and efficient way, mediated by interaction, participation, and dialogue.

Such competences reinforce the need for, and importance of writing posters and the skills developed from this practice. In addition, this experience was unique, considering that it allowed a simulation of presentations like those occurring in scientific congresses, especially for those students who had not yet had such an opportunity. In addition to all the capacity for schematization and the writing of posters, nervousness and anxiety came into play as result of a new experience, the expectations and willingness to expose the works. The changes in the construction and presentation skills of the posters between the first and the third were clear and the feelings previously based on the unfamiliarity of the new were replaced by a constructive and fruitful nervousness.

In this experience, the posters were transposed from their usual use, restricted to the academic environment, and served as a devolution to the health teams, not only as a synthesis of a work, but as proposals for improvement and interventions articulated with reality and with the needs found in each health service.

In this sense, Guizardi et al.[13] states that:

> (…) for students, practice scenarios become spaces in which knowledge comes to life and is confronted with challenges that require active posture, in which the components of the curriculum are mobilized and articulated according to the problems posed by the practice (p. 165).

With this action, the various units of the primary health care services involved with our work had feedback of situations or problems that could be solved in function of the critical and reflective vision present in our writing. In general, the health teams involved evaluated the work positively and the posters were permanently exposed in the health units, fulfilling their role as an exhibitor.

The fruits of all this experience of writing and communication using posters allowed us to present a paper at the Regional Meeting of Medical Students, with the metalinguistic theme: "Digital posters in medical education: an information and communication technology capable of integrate teaching, service and community". This was a first experience of presenting work in a scientific congress, and it aroused positive impressions by bringing an opportunity for scientific enlightenment and by allowing the development of a unique experience that will certainly trigger our interest in scientific research and dissemination.

Other students of this HEI also presented scientific papers in congresses. With the study and the development of the writing and presentation of posters by this discipline, there was concomitantly an increase of the stimulus to students' participation in congresses. In 2017, at the Brazilian Congress of Medical Education (*Congresso Brasileiro de Educação Médica*, as known as COBEM), more than 50 papers were presented by the students of this course, and about 30 of them had a relationship with this discipline. These results are reflections of a successful work developed in this institution. Obviously other factors, besides learning about posters, are responsible for this training since there are other professors, in other curricular components of the course, who also committed to teaching quality research.

Finally, we believe that this experience has brought students closer to Primary Health Care, their understanding, and the joint construction of knowledge with other colleagues and health professionals. In addition, the students were enabled to act actively as a constructor of their own learning, to develop a greater ability to synthesize and to improve communication skills. In view of this, we recognize through the developed competences the importance of the continuous use of this tool not only for medical education, since it presents benefits that strengthen the interaction between students, colleagues and teachers, prepares the student for a scientific future, expands the skills of communication and relationship with the spectator and with the community, integrates teaching-

service-community and allows the student to leave the purely technical-academic environment and reach scientific means of expanding knowledge.

CONCLUSIONS

Nowadays, we can observe the need to computerize and boost teaching methods, thus the use of posters as a tool works insofar as it synthesizes learning by replacing traditional means of teaching – such as lectures, theoretical classes, and assessments – which sometimes evaluate the student's ability to memorize and not the learning process. This model can also attract more attention of part of students and professors and stimulate the approach of possible interested parties to the exposed subjects. We believe that this inexpensive and extremely effective experience can be replicated in any academic course, if it is in accordance with the competencies expected for the training of that professional.

Knowing how to produce a poster is a fundamental competence in the academy, because in addition to all the advantages already mentioned such as a greater dynamism in the learning-process, it arouses students' interest in systematization and dissemination of academic knowledge. There is also the fact that scientific conferences have been continuously used posters presentations. This makes the learning of how to make a good poster even more necessary in the classroom, preparing students not only with the content to be taught in any discipline, but also with what they will face daily in academic congress with a commitment to the dissemination of quality of what is produced in the academic environment.

Authors' participation: The activity described here was created by Mariana Hasse, Gustavo Antonio Raimondi, Danilo Borges Paulino and Wallisen Tadashi Hattori, who were responsible for the curriculum at the time. Carolina Nunes Silva and Fernanda Fernandes Alves participated in the activity as students. All of them collaborated in writing and revising the article. Carolina Nunes Silva, Fernanda Fernandes Alves, Gustavo Antonio Raimondi, and Danilo Borges Paulino wrote the introduction and method. All authors contributed to the writing of results, discussion, and conclusions.

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