

Nursing Education for the Use of Information Systems: Paths to Critical Pedagogy

Formação em Enfermagem para Uso dos Sistemas de Informação: Caminhos para a Pedagogia Crítica

Formación en Enfermería para el Uso de los Sistemas de Información: Caminos Hacia la Pedagogía Crítica

RESUMO

Objetivo: Descrever ações de Educação Popular em Saúde voltadas à vigilância em saúde no ensino de Sistemas de Informação em Saúde na formação em enfermagem. **Metodologia:** Estudo qualitativo, descritivo, do tipo relato de experiência, desenvolvido em uma disciplina do curso de Enfermagem de universidade pública do sul da Bahia, entre março e julho de 2025, fundamentado na Pedagogia Crítica de Paulo Freire, nas contribuições de bell hooks e na Educação Popular em Saúde. **Resultados:** As ações pedagógicas promoveram participação ativa, diálogo e problematização da realidade, fortalecendo a articulação teoria-prática e o desenvolvimento de competências críticas para o uso dos SIS na vigilância em saúde, em contraposição ao modelo bancário de ensino. **Conclusão:** As práticas educativas críticas, dialógicas e engajadas fortalecem a consciência crítica, a autonomia discente e a formação de enfermeiras capazes de analisar, questionar e intervir nos territórios, reafirmando a educação como prática de liberdade e transformação social no SUS.

DESCRIPTORES: Educação em saúde; Sistemas de informação em saúde; Vigilância em saúde; Enfermagem; Formação Profissional em Saúde.

ABSTRACT

Objective: To describe Popular Health Education actions focused on health surveillance within the teaching of Health Information Systems in nursing education. **Methodology:** A qualitative, descriptive study in the form of an experience report, developed within a Nursing undergraduate course at a public university in southern Bahia, Brazil, between March and July 2025, grounded in Paulo Freire's Critical Pedagogy, bell hooks' contributions, and Popular Health Education. **Results:** The pedagogical actions promoted active participation, dialogue, and critical problematization of reality, strengthening the theory-practice integration and the development of critical competencies for the use of Health Information Systems in health surveillance, in contrast to the traditional banking model of education. **Conclusion:** Critical, dialogical, and engaged educational practices enhance critical consciousness, student autonomy, and the training of nurses capable of analyzing, questioning, and intervening in territories, reaffirming education as a practice of freedom and social transformation within the Brazilian Unified Health System (SUS).

DESCRIPTORS: Health education; Health information systems; Health surveillance; Nursing; Health professional education.

RESUMEN

Objetivo: Describir acciones de Educación Popular en Salud orientadas a la vigilancia en salud en la enseñanza de los Sistemas de Información en Salud en la formación en enfermería. **Metodología:** Estudio cualitativo, descriptivo, del tipo relato de experiencia, desarrollado en una asignatura del curso de Enfermería de una universidad pública del sur de Bahía, Brasil, entre marzo y julio de 2025, fundamentado en la Pedagogía Crítica de Paulo Freire, en las contribuciones de bell hooks y en la Educación Popular en Salud. **Resultados:** Las acciones pedagógicas promovieron la participación activa, el diálogo y la problematización crítica de la realidad, fortaleciendo la articulación teoría-práctica y el desarrollo de competencias críticas para el uso de los Sistemas de Información en Salud en la vigilancia en salud, en contraposición al modelo bancario de en-

señanza. **Conclusión:** Las prácticas educativas críticas, dialógicas y comprometidas fortalecen la conciencia crítica, la autonomía estudiantil y la formación de enfermeras capaces de analizar, cuestionar e intervenir en los territorios, reafirmando la educación como práctica de libertad y transformación social en el Sistema Único de Salud (SUS).

DESCRIPTORES: Educação em saúde; Sistemas de informação em saúde; Vigilância em saúde; Enfermagem; Formação profissional em saúde.

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INTRODUCTION

The expanded concept of health associates living conditions with the health-disease process and guides the formulation and implementation of strategies in the Unified Health System (SUS) for the enforcement of constitutional rights. In addition, it requires constant evaluation and monitoring of the population's health conditions for a comprehensive view of the policies implemented at the national, state, municipal, or territorial level¹.

In this context, Health Information Systems (SIS) are state structures that enable territorial diagnoses, the construction of indicators, planning and evaluation, as well as the organization of work processes². They are coordinated by the national SUS authority and implemented by regional authorities for the evaluation, monitoring, and intervention in health policies, including surveillance³.

The SUS, as the organizer of the

health workforce in Brazil, must coordinate with the education sectors for the training of health professionals⁴. Thus, the curriculum guidelines for nursing courses must be in line with the training of skills and competencies that meet social needs, training professionals-citizens to intervene in the health-disease process effectively⁵. This coordination has a direct impact on teaching and learning processes. However, the guidelines and pedagogical political projects (PPP) of the courses alone do not ensure that their guiding principles will be implemented by institutions and curricular components⁶.

Health surveillance is a recurring component in the PPPs of nursing courses in public institutions in Brazil, with the terms "notification," "investigation," and "information" appearing more strongly in the syllabi, demonstrating that VS is central to the nurse training process⁷. In this scenario, critical pedagogy, inspired by Paulo Freire, has been incorporated

into educational practices in health, seeking to break with banking education and is based mainly on theoretical and methodological frameworks that share the vision and construction among the actors involved in the educational process, appropriate to the uniqueness of each actor in different contexts^{8,9}.

Based on Freire's work and trajectory, American author and activist *bell hooks* highlights that critical awareness for questioning structures, building authentic relationships among peers, valuing singularities, challenging norms, equity, and valuing diversity are central points for building the educational process and a sense of community¹⁰. In the field of health education, these principles are in line with the guidelines of the National Policy for Popular Education in Health (PNEPS), widely used in the Brazilian Unified Health System (SUS) and also applicable to the design of training processes for health professionals¹¹.

Experience Report

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Given the above, although there are studies on surveillance in PPPs, there are few on Freirean pedagogical practices in the teaching of SIS and health surveillance in nursing education, which justifies the need to describe experiences, singularities, and weaknesses in critical engagement for the construction of skills and competencies necessary for the work of nurses in SUS health services, especially with the use of SIS for VS. Given this, the objective was to describe popular health education actions focused on health surveillance, developed in a university course in southern Bahia.

METHOD

This is a qualitative, descriptive, experience report-type study of the teaching actions of a course in the bachelor's degree program in nursing at the State University of Santa Cruz (UESC), southern Bahia, Brazil, based on the strategies outlined in the National Policy for Popular Education in Health and the theories of critical pedagogy^{8,10} between March and July 2025.

For its design, the study was methodologically anchored in the assumptions of *Mussi; Flores & Almeida (2012)*¹², who define experience reports as a written expression of experiences that have the capacity to contribute to the production of knowledge in the most diverse areas and relate a series of basic components for its methodological design.

The actions aimed to develop competencies and skills in the use and interpretation of health information systems for nurses working in health surveillance actions and services in the SUS and were part of the syllabus of the course "Health Information Systems," offered in the 4th semester of the nursing course at UESC, in Ilhéus, a medium-sized municipality in the south of the state of Bahia.

The action was developed with a

target audience of 24 regularly enrolled students, a supervising professor, and two student monitors who coordinate teaching and extension activities, together with the Infectious Diseases Laboratory of the Center for Nursing Studies, Research, Extension, and Methodologies (NEPEMEnf/UESC), using the hours available for the discipline, a classroom equipped with desks and tables, a projector, a whiteboard, and technological equipment for the mediation of active methodologies.

The activities were developed

based on the Popular Education in Health proposal, which articulates the real scenario of practice with a reflection by the student on their thinking and acting, as an integrated part of the daily work of health professionals¹¹. The course schedule included synchronous (in the classroom) and asynchronous (methodologies outside the classroom) moments, divided into three stages: 1 - Concepts and problem situations; 2 - self-knowledge and student experiences; 3 - workshop with practical experience in the use of HIS, as shown in Table 1.

Tabela 1. Atividades de Educação Popular em Saúde na disciplina de Sistemas de Informação em Saúde.

EDUCATIONAL OBJECTIVE			
Develop skills and competencies for using HIS for health surveillance.			
CONTENT/SUBJECT (What?)	STRATEGIES (How?)	RESOURCES (With what?)	
Pre-design: Meeting to discuss conceptual and material feasibility;	Feasibility analysis and strategic alignment.	Online meeting room – Google Meet.	
1st Moment: Synchronous classes with concepts inherent to the formation of skills and abilities; Problem situation;	Dialogued presentation and problematization.	Classroom.	
2nd Moment: Part 1 – Discussion on student self-awareness and lived experiences; Part 2 – Discussion of articles with problem situations and experiences;	Listening; Problematization.	Classroom; Technological equipment; Printed texts.	
3rd Moment: Practical dialogue workshop	Dialogued presentation; problematization and listening.	Classroom; Technological equipment.	

Source: Prepared by the authors (2025).

In the pre-design phase of the action, the supervising teacher met with the student monitors to verify the conceptual and material feasibility of the activities, which culminated in the three implementation phases. In the first moment, the initial classes were used for the dialogued presentation of the concepts inherent to training on the use of SIS and health surveillance, addressing topics such as: the historical rescue of SIS in Brazil; the main SIS used in Brazil; the proposal for the interoperability of SIS in Brazil; main applications and indicators of SIS. Linked to these topics, a problem situation was presented that outlined the life of a SUS user, from birth to death, and the relationships with SIS and the impacts on the health of the population.

The second stage lasted about 4 days/12 classes and was partly intrinsic to the conceptual classes, in which the supervising teacher and student monitors mediated the debate on student self-knowledge and experiences related to SIS and everyday problem situations. In the second part, the class was divided into four discussion and work groups, in which articles related to the use of SIS and the students' experiences were made available, with each group assigned one of the following major themes: Inequality and infant mortality; loss of vaccines and vaccination coverage; cervical exams; relationships between tuberculosis and income.

After the articles were made available, the groups had asynchronous moments to prepare a brief discussion on what each group was able to highlight about the use of SIS and the feasibility of reproducing the issues raised in the article in the daily professional practice of nurses, whether in care services or management.

The third moment consisted of a practical dialogue workshop in which, in the first part, the student monitors gave a brief presentation on

the practical use of SIS and gave each group the opportunity to collect data in the system, based on their theme in a territory of the group's choice. Each group was asked to provide the appropriate equipment to carry out the activity. During the workshop, the teacher and student monitors gave an initial presentation on data collection in one of the SIS, as well as answering questions. At the end of the workshop, the data was presented in a roundtable discussion with the whole class, which also provided an opportunity to gather criticism, suggestions, and comments from students on their experience with the course methodology.

On another day, continuing with the second part of the workshop, we sought to promote critical reflection in order to articulate concepts and promote conceptual and reflective advancement based on questions about the data collection process and the field of nursing in health surveillance.

This analysis was supported by the field diaries of the observations made by the teacher and student monitors of the action, and by extensive bibliographic references from the literature, in line with Freire's theories of critical pedagogy. This study does not require ethical review as it describes observations and experiences regarding the development of actions in a disciplinary component, without identifying the participating actors.

RESULTS

A total of 9 (36 hours/class) synchronous face-to-face meetings and 2 (9 hours/class) asynchronous group activities were held, with 24 students enrolled and 12 hours/class of absence among the students. The SIS discipline studies the theoretical and conceptual aspects of information, health information, and the SIS used throughout the national territory and their impacts on the professional per-

formance of nurses, especially with regard to the competencies and skills of health surveillance in the SUS.

The EPS actions implemented in the course addressed the contradiction of the norm, training professionals who have the ability to use SIS, linking them to the problems of their daily professional lives, contrary to banking education. In the three moments, the students participated extensively, relating the concepts presented to the problem situation of the SUS user and the relationships between the right to health and its trajectory in SIS. Linked to this, the practical experience of data collection and assessment of the health situation in the territory chosen by each group can provide each student with the opportunity to collect data using SIS and outline observations about health surveillance. In addition, teaching/research/extension/assistance were articulated by encouraging extension and research in everyday problem situations.

DISCUSSION

The implementation of HPS actions suggests a break with the traditional banking, technical, and content-based model of SIS teaching, which is often centered on the uncritical transmission of regulations, indicators, and flows. According to Freire, banking education is an educational model in which the teacher passively transfers content to the student, who is in a receptive position, without dialogue, reflection, or questioning⁸. In contrast, the action reported exposes a pedagogical proposal that shifts the focus from "learning the systems" to critically understanding health information as a social product, traversed by everyday problem situations.

The practices are also related to hooks (2013)⁽¹⁰⁾ who states that engaged teaching requires practices that call on students to think, question,

and take a stand. The conversation circles, the asynchronous moments of dialogue between the groups, and the dialogue workshop favored active listening, the exchange of knowledge, and the collective construction of meanings about the use of SIS and its use for health surveillance in the territories.

“ For teaching as a practice of freedom, it is necessary to build an authentic connection between educators and students based on the construction of genuine relationships between peers, of a horizontal nature^{8,10}. ”

In this experience, the crucial role of the educator and facilitators in building the pedagogical community stands out, whether by listening to fears, desires, and experiences, or by desocializing the narratives of experiences for classroom discussion, dialoguing directly with the reality of the territories, with previous experiences and with theory and practice, thus

eliminating the possibility of educators acting as omniscient and silent inquisitors, commonly idealized in banking education in health training processes¹⁰.

The practical experience of collecting and analyzing SIS data proved to be fundamental for the construction of critical collective consciousness, central to Freire's work in understanding that the relationship between theory and practice occurs, first and foremost, in the relationship between man and the world, as an essential condition for articulating a coherence between thought and action, which is praxis⁸. Based on this understanding, the participating students were able to reflect on the limitations of the systems, the inequalities expressed in the data and analyses collected, and the political implications of using SIS for health surveillance and guaranteeing the right to health in Brazil.

Learning becomes even deeper when it involves the body, emotions, and lived experience, not just concepts and protocols. The analysis of topics such as infant mortality, vaccination coverage, and tuberculosis inequalities were tools for critically reading reality, also used as tools in other experiences based on critical pedagogy¹³. Thus, based on the students' experience with the reality in which they live, they take on the task of analyzing and reflecting on their reality in order to develop a critical appreciation of it and thus actively collaborate in the development of essential skills and competencies for health surveillance¹¹.

The HPE actions were limited by the reduced time allocated to the discipline and unequal access to technological equipment, given the temporary impossibility of using the university's computer labs. Thus, it should be noted that critical educational practice is an unfinished process marked by the tensions and contradictions of the current educational

system⁸ and that engaged teaching requires, in addition to the willingness of teachers, institutional investment, material conditions, and continuing pedagogical training¹⁰. Furthermore, these weaknesses do not invalidate the proposal for pedagogical innovation, which points to ways to improve and institutionalize critical pedagogy practices in the pedagogical projects and curricular components of the nursing course, contrary to the norm^{7,14}.

The experience contributed to filling the gap in Freirian practices in the teaching of SIS and health surveillance for work in the SUS, based on the outline of paths for critical pedagogy. EPS can thus constitute a central strategy for health training, especially in the unequal Brazilian historical-social context in which health training must meet social demands.

CONCLUSION

The experience demonstrates that Popular Health Education actions based on critical, dialogical, and emancipatory approaches constitute a necessary break with the banking and technical model of teaching that still predominates in health training processes, by shifting the focus from the mere transmission of content to the critical understanding of health information as a situated social construction. By valuing listening, the horizontality of pedagogical relationships, and the socialization of experiences, the proposal strengthens the articulation between theory and practice as a transformative praxis, promoting professional autonomy in nursing and the training of individuals capable of analyzing, questioning, and intervening in the concrete reality of the territories, reaffirming the role of education as a practice of freedom and commitment to transforming the health conditions of the population.

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