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USE OF TECHNOLOGY IN THE TEACHING OF NURSING SEMIOLOGY AND SEMIOTECHNIQUE

USO DE TECNOLOGIAS NO ENSINO DE SEMIOLOGIA E SEMIOTÉCNICA DE ENFERMAGEM

USO DE LA TECNOLOGÍA EN LA ENSEÑANZA DE SEMIOLOGÍA Y SEMIOTÉCNICA DE ENFERMERÍA

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Objective: to report the experience of students, professors and professor's assistants (PA) when using different educational technologies during theoretical-practical teaching of nursing semiology and semiotechnique. Method: report of teaching practice of 2 PA, 2 professors and 187 students from a Nursing graduate course in Vitória, Espírito Santo, conducted from 2015 to 2017, with reflections based on Merhy's theory. Results: the teaching was mediated by soft technologies associated to soft-hard ones, seeking the development of skills that could enhance knowledge production, and, in the future, be applied in professional practice, having as horizon a humanized nursing care, not restricted to techniques. Conclusion: the reported pedagogical praxis favored the development of relational and manual competences, the student's autonomy and critical and reflective thinking, necessary the theoretical-practical articulation, clinical decision-making and new ways of producing nursing care.

Descriptors: Education, Nursing. Innovation. Educational Technology. Teaching. Nursing.

Objetivo: relatar a vivência de discentes, docentes e monitores na utilização de diferentes

tecnologias educativas durante ensino teórico-prático de semiologia e semiotécnica de enfermagem. Método: relato de prática de ensino de 2 monitores, 2 docentes e 187 alunos de um curso de graduação em enfermagem de Vitória, Espírito Santo, realizado de 2015 a 2017, com reflexões sustentadas no referencial teórico de Merhy. Resultados: o ensino foi mediado por tecnologias leves associadas às leve-duras e duras, buscando-se o desenvolvimento de competências que pudessem aprimorar a produção de conhecimentos e que possam futuramente ser aplicadas na prática profissional, tendo como horizonte um cuidado de enfermagem humanizado e não restrito ao tecnicismo. Conclusão: a práxis pedagógica relatada favoreceu ao desenvolvimento de competências relacionais e manuais, à autonomia discente e ao pensamento crítico-reflexivo, necessários à articulação teórico-prática, à tomada de decisão clínica e a novos modos de se produzir cuidado em enfermagem.

Descritores: Educação em Enfermagem. Inovação. Tecnologia Educacional. Ensino. Enfermagem.

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Objetivo: reportar la experiencia de los estudiantes, profesores y monitores en el uso de diferentes tecnologías educativas durante la enseñanza teórica-práctica de semiología y semiotécnica de enfermería. Método: relato de práctica docente de 2 monitores, 2 profesores y 187 estudiantes de un curso de graduación en enfermería de Vitória, Espírito Santo, realizado de 2015 a 2017, con reflexiones sostenidas sobre el referencial teórico de Merby. Resultados: la enseñanza era mediada por tecnologías leves, asociadas a leves-duras, buscando el desarrollo de habilidades que podrían mejorar la producción de conocimiento, y que, en el futuro, podrían ser aplicadas en la práctica profesional, teniendo como horizonte un cuidado de enfermería humanizado y no restringido al tecnicismo. Conclusión: la praxis pedagógica relatada favoreció el desarrollo de competencias relacionales y manuales, la autonomía de los estudiantes y el pensamiento crítico y reflexivo, necesarios para la vinculación teórico-práctica, la toma de decisiones clínicas y las nuevas formas de producción de los cuidados de enfermería.

Descriptores: Educación en Enfermería. Innovación. Tecnología Educacional. Enseñanza. La Enfermería.

Introduction

The main objective of the nursing academic education is to graduate qualified nurses, capable of taking care of patients in clinical environments, with the ability to make decisions. Thus, the nursing education should focus on methods that encourage problem-solving skills and development of critical thinking[1].

In this sense, the nursing graduate courses include, in their syllabus, the semiology and semiotechnique subject, necessary to build knowledge that will enable implementing care in different environments into which the nursing professional may be inserted. The teaching of this subject is materialized through theoretical-practical activities, fundamental to trigger the critical reflection, promote the acquisition of basic concepts and the development of skills and competencies based on real or simulated care situations[2].

This training makes the nurse capable of performing a satisfactory data collection, the first step of the Nursing Process (NP), which gathers subjective and objective data through anamnesis and physical examination, aiming to obtain information to subsidize record, planning and implementation of procedures with the patient in a systematized way[3-4].

The environment/moment of teaching of semiology and semiotechnique should be potentiated by the use of different methods that encourage learning and contribute to innovative and effective pedagogical processes. A teaching-learning strategy commonly used in the health area is the tutoring, pedagogical support that has the ability to stimulate the student's autonomy and promote a channel for dialog between students and professors[5]. The use of different technologies as teaching tools is also a great ally to learning in nursing, since it enhances the development of a pedagogical process that overcomes modes of teaching semiology and semiotechnique exclusively focused on techniques.

Health work is relational and, thus, brings as centrality the living labor, that is, the healthcare products result from actions. Therefore, the act of caring necessarily implies the using soft health technologies (which include the interpersonal relationships, the bond and the reception), which must be exchanged with the soft-hard (which aggregate the structured knowledge sustained in the Health Sciences) and hard technologies (relating to tools and devices). The interaction of different technologies in the act of caring conforms the health work process, which may be harder and protocol-based or more dynamic and dialogic[6].

Applying this reflection in the context of pedagogical praxis, different technologies can be used in the nursing teaching-learning context to promote the development of skills that allow future nurses to produce a creative act-living work[6] and, above all, focused more on relations than on instruments.

Therefore, this study aimed to report the experience of students, professors and professor's assistants on the use of

different educational technologies during the theoretical-practical teaching of nursing semiology and semiotechnique.

Method

This is a descriptive study, of the experience-report type, product of the practical experiences of professors, professor's assistants (PA) and students from a nursing graduate course at a public university in Vitória, Espírito Santo. The results reflect the discussions on the methodological strategies of intervention carried out between March 2015 and December 2017, during the theoretical-practical classes and tutoring moments of the semiology and semiotechnique subject. The participants of the activities presented in this report were 2 professors, 2 PA and 187 students (on average, 31 students per semester).

The theoretical-practical subject of semiology and semiotechnique is mandatory in the third semester of the graduate course scenario of this study. Its total duration is of 120 hours, also providing 20 hours of monthly tutoring. According to its syllabus, it seeks to prepare the student for understanding semiology and semiotechnique as part of the NP, directing their activities to the full view of the human being. At the end of the subject, students are expected to be able to characterize the physiological changes, based on the functions of the systems and structures of the human body, interpreting objective and subjective data to implement the nursing diagnosis, according to the NANDA International, Inc. (NANDA-I)[7], the interventions according to the Nursing Interventions Classifications (NIC)[8] and the application of the remaining steps of the NP. The student is expected to be able to distinguish the nursing physical examination from history applied by other health professions, which should be carried out according to the theoretical framework adopted by the subject.

Initially, the contents cover the topics of biosafety, personal marketing, legislation and NP; then, the teaching focuses on topics related to physical examination, which are worked according to the Basic Human Needs (BHN) theory of Wanda Aguiar Horta. Based on this approach, the contents and techniques related to the evaluation of the psychobiological and psychosocial needs of the human being are discussed, which involve: skin-mucous integrity, body care and nutrition; olfactory, gustatory, visual and hearing perception; vascular regulation, oxygenation and cellular growth; elimination, hydrosaline and electrolytic regulation; neurological regulation; body mechanics, exercise, physical activity and locomotion; and sexuality[9].

After theoretical classes on a topic, the tutoring occur in the laboratory of nursing techniques, on days after the theoretical-practical classes (taught in the classroom and in the laboratory), and moments before students go to the practice at a teaching hospital, enabling the student to redeem the knowledge constructed along with professors, and then perform the procedures and techniques learned, in a holistic perspective. The participation in these moments is optional to students; however, almost all enrolled students attend them. Their times are flexible, previously scheduled, according to the students' need and availability of PA and practical laboratory. The library is also used for the construction of data collection instruments.

The subject is developed through the use of different teaching methodologies, traditional and active, combining various learning-mediating technologies, which are systematized in this report, based on a critical analysis sustained by the classifying proposal of Merhy for health technologies: soft, soft-hard and hard[6]. One seeks to make a reflection on new ways to teach, which, consequently, lead to new ways of thinking and doing health.

Since this is an experience report, the project was not submitted to the Research Ethics Committee. Nevertheless, this study complied with bioethical principles in accordance with Resolutions n. 466/2012 and n. 510/2016 of the National Health Council, including the use of strategies to ensure the anonymity of the participants of the educational actions described.

Results and Discussion

The combination of theoretical and practical activities is crucial in the education of the nursing professional for the development of technical skills, ethical behaviors and analytical-critical-reflexive ability. Therefore, they potentiate the consolidation of learning and the construction of a new knowledge. In this process, the semiology and semiotechnique subject plays a relevant role, because it inaugurates the approach of students to the professional reality and to instruments and routines of the nursing work[10].

Thus, in the context of this report, the use of soft, soft-hard and hard technologies was present in all the processes of teaching of semiology and semiotechnique, since the initial contact between professors, students and PA until the end of the semester, as described in Chart 1.

Chart 1 – Technologies and context of their use in theoretical-practical classes and tutoring moments of nursing semiology and semiotechnique

Technologies	Classification	Materials and Environment	Process Description
Reception	Soft	Practice laboratory	Initial moment of the subject, with the presentation of professors, PA, class dynamics and tutoring moments, and answers to possible questions related to the subject. This technology is also used throughout the semester.
Pair practices	Soft-hard	Developed in the practice laboratory, using various materials, depending on the contents and techniques covered. As an example, the stethoscope and sphygmomanometer are cited.	Simulation of techniques in colleagues. Example: when practicing vital signs, one student pretends to be the patient while the other incorporates the role of the nurse.
Construction of case studies and data collection instruments	Soft-hard	Developed at the Hospital, Practice Laboratory and Library. NANDA and Nursing Interventions Classifications are used.	Data collection developed at the hospital, with a weekly case study.
Poster	Soft-hard	Backdrop paper or cardstock, brush, legal paper, printer.	Poster made for illustration of the evaluation of cranial nerve pairs.
Dummies	Hard	Developed in the practice laboratory, using dummy, speaker and headphones.	The auscultation of cardiac and pulmonary sounds is performed.
Clinical materials	Hard	Clinical hammer, clinical flashlight, ophthalmoscope, otoscope, stethoscope, thermometer, scale, nasal speculum. Developed in the practice laboratory and hospital.	Proper use and handling of equipment. Example: adjustment and positioning of an ophthalmoscope.
Mobile Apps	Hard	Used in all teaching environments, online or offline.	*Software with the theme of semiology or related topics.*

Source: Created by the authors.

As depicted in Chart 1, the initial reception – soft technology – occurred in the laboratory of techniques, whose chairs were arranged as circles to facilitate dialog between the participants. It was performed at the first contact with the classes of each semester, with the support of different dynamics. An approach adopted, for example, was the sharing of experiences in the subject by the class from the previous semester, which enabled the new class the expression of their doubts, fears, expectations and curiosities in relation to the subject. At this time, the bond between students, professors and the PA also began to be built, establishing forms of communication. The PA came forward, as well as explained the dynamics of the subject, rules for using the laboratory and practices developed within the hospital environment, which, for most students, is a new environment.

The reception, in the bond perspective, permeates the whole semester collectively and individually, when the professors and/or PA realized this need, particularly when students demonstrated anxiety and fear in the moments that preceded the approach to the patient. In these cases, the professors or PA acted as intermediaries between the student and the patient, transmitting confidence and stimulating pro-activeness.

The bond between professors, students and PA was essential to reduce the nervousness of students, who, for the first time, were in direct contact with patients in the hospital facilities. For this reason, the dynamics of reception were essential to guarantee emotional support to students. Evidences show that the absence of this type of support can lead students to experience social and emotional loneliness[11].

Another technology that permeated the entire subject was the interpersonal communication, which is not restricted to academic environments. Messaging applications were used to facilitate contact between students and PA. The professors also promoted moments of relaxation before the practical assessments, such as the application of relaxation techniques. An important moment, in which the use of soft technology proved its value, was when, moments before an assessment, a student asked the PA for a hug to feel calmer.

As for soft-hard technologies, the subject worked the practices implemented in pairs, the construction of posters and guides for physical examination and case studies, based on NANDA-I[7] taxonomy and NIC[8]. Such activities were developed at the laboratory, hospital and library.

The pair dynamic occurred in the laboratory, simultaneously or after a practical demonstration of the content and/or techniques by the professor. When performing the semiological practice with their colleagues, the students could represent the patient or the nurse, in a system of alternation of pairs, thus allowing for improving the perception of adequate practice. When working with some specific content, the use of different hard technologies was also necessary, such as dummies with sounds for cardiac and respiratory auscultation.

The pair practices demanded the student's knowledge acquired during the classes to begin to develop their semiological skills. In this way, the student needed to be proactive, observer and listener and communicate with colleagues dialogically, thus engaging their relational skills.

The poster technology was used to present and test functionality of the pairs of cranial nerves. Prepared by the PA under professors' supervision and posted in an easily accessible place, was widely consulted by students. The preparation of guides to perform the physical examination began after the theoretical classes and ended during the practical classes, according to the student's reasoning, who was free to add and write the guide according to their needs. In case of doubts, the PA was consulted, indicating possible improvements. These guides were used both in the hospital and in the laboratory or other environment available for the student to practice.

When using the aforementioned resources in the laboratory, students began to perceive the patient's needs more clearly when they started the activities in the hospital. With this practice,

they were able to develop case studies weekly, which were drawn up based on objective and subjective data collected during the nursing history and physical examination. Based on them, diagnoses and nursing interventions were proposed according to the NANDA-I Taxonomy[7] and the NIC, respectively[8]. All studies were corrected and a feedback was given to each student, so that they could understand the points that needed improvement. The construction of the case studies requested student's autonomy, association of different types of knowledge acquired in different subjects previously attended and clinical reasoning, aiming at the assertive decision-making[12].

The hard technologies used were: dummies for cardiac and pulmonary auscultation, clinical instruments and use of applications for mobile devices. With the use of the dummy for cardiac and pulmonary auscultation, the students managed to differentiate the physiological sounds and their changes. This activity could be performed both individually and in groups, and the PA and professors acted as facilitators. In these moments, students had the opportunity to remedy their doubts and managed to realize what to expect from patients according to their health status. In the first contacts with this technology, the students, in general, showed difficulty to identify and/or differentiate the heart and lung sounds; when in contact with the patient in the hospital environment, however, they were excited and skilled in the practice of auscultation.

As for clinical instruments, they were handled and applied practically throughout the entire course of the subject, in the laboratory and in the hospital, to perform the physical examination. The students also learned how to calibrate the scales for measuring weight and received guidance on how to take care of tools and equipment, and how to store them. Applications for mobile device on themes related to semiology and semiotechnique were also used, whose advantage was the possibility of its use in offline mode, in any learning or practice environment. In moments of doubt, students resorted to these resources, some of which provide guides, sounds for cardiac and pulmonary auscultation, as well as videos.

Extrapolating this pedagogical praxis for the health area, one remembers Merhy[6], for whom soft technologies are relational and interactive. When relating them to other technologies – soft-hard and hard – a work process emerges, which, like work in education, results in act-living labor, that is, the care is produced (or knowledge in the field of education) at the exact moment in which the work is performed. The work in these two fields is always collective; thus, to care/teach requires involving the other (work colleague, student, PA, classmate). Together, through the sharing of their technologies, care occurs and knowledge is built[6].

This reasoning considers assertive the use of soft technologies in the entire subject, along with soft-hard and hard technologies, always seeking a context of mutual acceptance (professor-PA-student) to promote relational competences that may enhance the knowledge production during the teaching, and be applied in professional practice, aiming at a humanized nursing care.

This type of care requires the effective ownership of soft-hard technologies, which allow for developing skills geared to the structured technical knowledge, such as the NP, which requires a baggage of knowledge for the clinical judgment and, thus, for the production of a different care mode, centered on the needs and subjectivity of each individual[6]. It also requires the conscious use of hard technologies, so that care is not limited to the rigidity of the mechanistic techniques, and, thus, to the conformation of a dead work process.

Dead work is a previous work, already executed, thus incorporated to the instruments and equipment, and not originating a product[6]. Then, the health work process, focused on hard technologies, results in a little flexible and aware care with the individual's demands. Thus, the teaching-learning process reported here was not confined to rigid and prescriptive aspects, nor to the overlap of hard technologies over relational ones, but, on the contrary, it allowed students to use different types of technologies simultaneously, reflecting and demystifying the idea of a technicist nursing professional teaching and practice.

For example, technical skills were mainly worked based on simulation strategies, after the exchange of roles in pairs (the student could represent the nurse or the patient) and using dummies. These techniques, according to the literature, enhance not only the manual dexterity, but also the relational skills and strengthen the cognitive processes mobilized to articulate the theory to real care situations[13-15]. Then, soft technologies are fundamental for relations of learning to learn and learning to take care of.

The pedagogical process, historically, has centered on the figure of the professor and on the transmission of knowledge that must be memorized by students. Nonetheless, this model of education has already proved ineffective, because it relegates the student to a passive role that little contributes to acquiring types of knowledge. In an attempt to overcome it, the creation and use of innovative and active teaching methods and technologies are necessary in the educational context. They seek a democratic and transformative pedagogy[16].

Different benefits arising from the use of technologies in education were perceived by professors and students during the academic semester, as well as in the assessment processes. Many of them were already reported in the literature, such as the potentiation of the development of skills for nursing practice, evolution of manual skills, self-confidence in activities, ethical behavior, skill with instruments, knowledge about the working environment, acquisition of new knowledges, better theory-practice articulation and increased sense of security[17-18].

In the health field, as this report points out, the combination of different technologies mobilizes various attitudinal, cognitive, technical and ethical competences, so necessary to nurses, so that they act based on care integrality and humanization[19], that is, enabling the production of an act-living work, as taught by Merhy[6]. Based on these technologies, one may also overcome the healthcare model merely focused on equipment and protocols.

The skills and knowledge constructed during the subject of semiology and semiotechnique are expected to reflect in subsequent periods of the graduate course whose themes, more complex, require greater intellectual ability for the interpretation of objective and subjective data, without which the NP is not executed. Similarly, the knowledge produced collectively and relationally between professors, students, and PA are expected to intensify effective care practices.

As a limitation of the study, there is the non-use of evaluation methods before and after the experience reported allowing for the measurement of the impact of these technologies in education. Nevertheless, this report shall serve as a methodological support to other subjects, in different teaching places, as well as may subsidize new studies investigating the effects of this pedagogical praxis through methodological tools.

Conclusion

This experience report allows for affirming that the teaching of nursing semiology and semiotechnique can make use of different learning-mediating technologies to favor the development of skills necessary for a professional user-centered performance, in the perspective of a work process that builds with and for the user, without losing sight of the systematic aspects that guide the nurse's working process.

The subject object of this report was developed considering that different environments and people require different approaches that meet the learning needs of each student. Furthermore, an assumption adopted was that the nursing work is always relational, even when executing a technical act, which requires nurses' interpersonal skills, which, articulated to other abilities, will promote the production of new ways of care.

The use of different technologies - soft, soft-hard and hard - in the teaching of nursing semiology and semiotechnique favors the development of skills and relational, manual, ethical and humanistic abilities and promotes students' autonomy and critical-reflective thinking necessary for theory-practice articulation, clinical decision-making and new ways of producing nursing care.

Collaborations:

1 – conception, design, analysis and interpretation of data: Evandro Bernardino Mendes de Melo, Filipe Martinuzo Filetti, Lorena Barros Furieri and Mirian Fioresi;

2 – writing of the article and relevant critical review of the intellectual content: Evandro Bernardino Mendes de Melo, Marcio Coutinho Farias Leite, Elizabete Regina Araújo de Oliveira, Lorena Barros Furieri and Mirian Fioresi;

3 – final approval of the version to be published: Evandro Bernardino Mendes de Melo and Mirian Fioresi.

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