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Components of social learning theory in a tool for teaching Nursing

Componentes da teoria social de aprendizagem numa ferramenta para ensino na Enfermagem

Componentes de la teoría de aprendizaje social en una herramienta para la enseñanza en Enfermería

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ABSTRACT

Objective: to identify key components of the social learning theory in a computational tool to aid in teaching the reasoning process for the preparation of a nursing diagnosis. **Method:** qualitative study that analyzed the statements collected through a focus group of 18 teachers and students from two Brazilian nursing schools. **Results:** the themes were grouped into four categories related to the components of the theory and into 13 subcategories. **Conclusion:** the meaning of learning can be extended by the teacher's didactics and corroborated by the relationship between systematization and reasoning. To learn by doing, some prerequisites are required as is a process of motivation and qualification, which are also inherent to learning by forming an identity in the group. In the feeling of belonging to a particular group, aspects related to the profession become visible as opposed to the aspects of belonging to a community of practice of learning.

Key words: Nursing Education Research; Nursing Processes; Nursing Faculty Practice; Nursing Informatics.

RESUMO

Objetivo: identificar componentes fundamentais da teoria social de aprendizagem numa ferramenta computacional para auxílio ao ensino do processo de raciocínio para elaboração do diagnóstico de enfermagem. **Método:** estudo qualitativo que analisou o discurso, coletado por meio de grupo focal, de 18 professores e estudantes de duas escolas de enfermagem brasileiras. **Resultados:** os temas foram agrupados em quatro categorias relacionadas aos componentes da teoria e em 13 subcategorias. **Conclusão:** o significado da aprendizagem pode ser ampliado pela didática do professor e evidenciado pela relação entre a sistematização e o raciocínio; para aprender fazendo são necessários pré-requisitos e um processo de motivação e capacitação, que também é inerente à aprendizagem pela formação de identidade no grupo; no sentimento de pertencimento a um determinado grupo tornaram-se visíveis aspectos relacionados à profissão em detrimento do pertencimento a uma comunidade de prática de aprendizagem.

Descritores: Pesquisa em Educação de Enfermagem; Processos de Enfermagem; Prática do Docente de Enfermagem; Informática em Enfermagem.

RESUMEN

Objetivo: identificar composición fundamental de la teoría social de aprendizaje en una herramienta computacional para el auxilio a la enseñanza del proceso de raciocinio para elaboración del diagnóstico de enfermería. **Método:** fue realizado un estudio calificativo, lo cual analizó el discurso, colectado por medio del grupo foco, con 18 maestros y estudiantes de dos escuelas de enfermería brasileñas. **Resultados:** los temas fueron agrupados en cuatro categorías relacionadas a los componentes de la teoría y en 13 subcategorías. **Conclusión:** el significado de la aprendizaje puede ser ampliado por la didáctica del maestro y por la relación en medio de sistematización y el raciocinio; para aprendizaje haciendo son necesarios requisitos previos y uno proceso de motivación y capacitación, además, también es inherente el aprendizaje por la formación de identidad en el grupo;

con sentido de pertenencia a un determinado grupo se hicieron visibles aspectos relacionados a la profesión en detrimento de suya pertenencia a una comunidad de práctica del aprendizaje.
Palabras clave: Investigación en Educación de Enfermería; Procesos de Enfermería; Práctica del Docente de Enfermería; Informática Aplicada a la Enfermería.

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INTRODUCTION

In recent decades the educational process has undergone modifications that include the constant presence of digital technologies. The teaching of nursing did not remain oblivious to this movement, and the literature shows examples of teaching strategies that use virtual resources to aid in the teaching and learning of this subject[1-3].

Learning is a process in which students develop their knowledge through interactions with the teacher. When digital technologies are included in the teaching process, the teacher must be willing to present such technologies to the students, provide information and diverse routes, and encourage them to contribute in this process[4]. Therefore, educational software designed to enhance learning and teaching work presupposes interactivity and organization based on pedagogical theories and methodologies compatible with the principles presented[4].

This study uses the prototype of a computational tool whose purpose is to complement the teaching of the student's reasoning process for the preparation of the nursing diagnosis (ND). The tool brings together content from a method used in undergraduate, graduate, and continuing education environments[5-6] established in steps represented by the software screens. Based on a simulated case proposed by the teacher, the student selects relevant information; indicates the problems and potentials and then lists the health needs; identifies the focus of nursing practice and its respective judgments; prepares the ND with the use of the International Classification for Nursing Practice (CIPE®); establishes nursing outcomes; and chooses nursing interventions for priority ND[6].

Some functionalities are planned for the tool, and one of them is for the students to establish communities of practice (CoP) within the discipline itself. The teacher follows the evolution of the student's learning by engaging in the CoP or through reports that make it possible to assess the difficulties or facilities of individuals and of the entire group in the process of solving the case studies proposed.

The CoP consists of a group with a common interest whose participation gives meaning to the experience and therefore fosters learning. Three elements are needed to define a CoP: the topic (domain) under discussion, the interaction/relationship between the people that makes the community exist, and the practice itself[7].

The social learning theory (SLT)[7] was taken as a reference for developing the computational tool, which brings together new concepts highlighting changes in the perspective of teaching models in virtual learning environments, including the CoP. The SLT views adults as subjects of learning, which is carried out in a comprehensive manner because it is not only directed at the development of the individual's skills and abilities, but also encourages a participatory process[7]. The theory lists four key components to learning: the meaning, which expresses the need to give meaning to what is learned; the practice, which underlines the experience of "learning by doing"; the community, which strengthens the learning by fostering a sense of belonging; and identity, which presents aspects related to the learning process for the transformation of personal identity[7].

In the context presented, the research intended to answer the following guiding question: Are the key components of the social learning theory identified by the users of a computational tool prototype?

The objective of the study was to identify how the key components of the social learning theory are presented in a computational tool to aid in teaching the reasoning process for the preparation of a nursing diagnosis.

METHOD

A qualitative study was carried out in two nursing schools: one is a philanthropic institution located in Curitiba, the capital of the state of Paraná, and the other a public institution located in the capital city of São Paulo. The estimated group consisted of 24 participants: 12 students and 12 teachers in nursing undergraduate courses, equally divided between the two schools.

The students included were those in their last year of undergraduate studies and the ones excluded were those who during data collection were given sick leave, those with pending credits in clinical practice disciplines, and those transferred from other institutions in the last year. The teachers included were those of practical subjects or clinical internship, those responsible for teaching hospital clinical practice or courses in community health for more than three years, and those with a master's degree or a doctorate in nursing or in education. The ones excluded were those who taught classes in two educational institutions and who did not use ND language in their teaching practice. Because the number of students and teachers who complied with the criteria was higher than that initially defined, a random drawing was held.

Before collecting the data, the participants experimented with the prototype, evaluating its usability, navigability, and the potential of some of its functionalities.

Data were collected through the focus group technique composed of students and teachers in the same group using a script with open questions that addressed the fundamental components of learning in accordance with the SLT. The focus groups met in November 2010 in Curitiba and in May 2011 in São Paulo with one meeting in each school. So that the minimum number of participants could be representative and to make the

focus group more operational, 10 students were invited in each scenario. Three teachers and eight students participated in Curitiba and five teachers and two students in São Paulo, totaling 18 participants whose statements made during the discussion in the focus groups formed the body of analysis.

A camera and recorder were used as well as the guidelines of observation. Statements were transcribed word-for-word, correcting only colloquial jargon. The body of the analysis was based on phases of the analysis of the statements and consisted of: repeated reading of the text, identification of themes and figures, the search for a link between them, identifying more than one meaning in the speech of those responding, the recomposition through thematic phrases for categorization[8], and identifying the SLT components. The decision was made to work with the categories established previously related to the SLT components: meaning of learning, learning by doing, learning by building an identity, and learning by the feeling of belonging to a community[7]. Each category consisted of interpretive subcategories and were underlined with theoretical references.

The statements originating from the focus groups initially gave rise to 79 topics that were grouped into four analytical categories related to the SLT components and into 13 subcategories (Figure 1). The subcategories, 'motivation' and 'training' were identified simultaneously in the categories as, building an identity and learning by doing respectively.

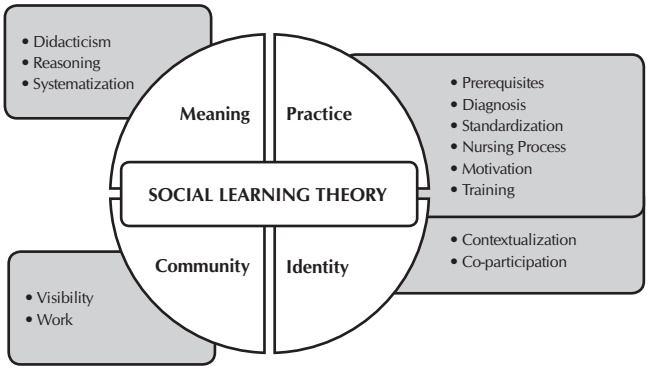

Figure 1 - Categories and sub-categories of analysis extracted from the statements made in the focus groups with Nursing teachers and students in Curitiba and São Paulo, Brazil, 2011

The research was part of a project called "Evaluation of a computer system to aid in individual and collective diagnostic reasoning while using CIPE®/CIPESC®" as approved by the Research Ethics Committee of the Pontifical Catholic University of Paraná under the decision no. 3309/2009. All participants were informed about the study and signed a written consent form (WCF).

RESULTS

In the category under 'meaning', the participants expressed the view that the ability to give meaning to what is being learned can be leveraged from the didactic method adopted by teachers who, when using a computational resource, also change the way they teach. In the case of the tool evaluated, it offers meaning for learning in the reasoning process:

> [...] *Even teachers, when preparing, can learn using the tool and can build cases that lead them to reason too.*

A relationship can be seen in the statements between systematization and reasoning as an integral part of the sense of learning:

> *Maybe because it* (the nursing process) *is more dynamic* [...]. *Today we see that everything is moving forward and is centralized to systematize or to operate using technology*.

> [...] *It isn't something that's there, ready. So it forces you to think and to refine our clinical reasoning.*

The category, "learning by doing" gave rise to the largest number of subcategories. The participants commented that to "learn by doing" some prerequisites are necessary, related to the characteristics of their own computational resources:

> [...] *You should have a little common sense for us* (the teachers) *to be using the tool when it is implemented. This way* [...] *not to circumvent the reasoning.*

Regarding institutional characteristics such as the lack of an institution's incentive, financial investment restrictions, and the recognition of the importance of learning from reasoning this statement was made:

> [...] *a lot of things have to happen before; this has to be a philosophy of the service, the institution's philosophy.*

Teachers and students realize that to learn by practicing it is necessary to have a process of motivation and training and for participating in a CoP:

> [...] *I think that it comes to destabilize and put fuel on the fire, and that's very good*.

> [...] *people need to be trained, because it's not me* (the teacher) *who has to formulate the diagnoses* [...].

The statements made by the students regarding their experience highlighted insufficient learning strategies for developing the reasoning for ND in undergraduate courses:

> [...] *if you* (student) do*n't have at least a general notion of diagnosis and needs, you won't be able to find and do the clinical findings*.

Thus, practicing within virtual environments is considered a complementary support to classroom activities, as it causes inexperience to be compensated by successive simulation drills:

> [...] *even after you finish your elective internship, it did not put it all together. You* (student) *still can't do enough; you need more practice time and the tool does just that*.

> [...] *this instrument starts from zero. You start building, putting it all together until you reach the end of the diagnosis. You are going to build the entire process.*

Aspects related to the practice of using standardized language were identified as a learning element:

> [...], *because if each person makes a very different diagnosis, then something is wrong* [...].

At this point reference was made to the practice of the nursing process:

> [...] *the physical examination and medical history would be a complement; they would not be forgotten. We would have to keep evaluating, talking, and interviewing.*

Thematic phrases that addressed motivation and training were also associated with the building process or transformation of personal identity:

> [...] *It is messing with what was very comfortable* [...] *and this causes us to stick with it and become better, sometimes worse.*

> [...] *I can do this. Deep down I think I am capable, and you always think so, but you give a lot of excuses.* [...] *When something comes up to put us to the test, put us in check. I have doubt; I am doing something that is within my discipline, within the context of knowledge that I have.*

Another point identified in learning as a process of building an identity is the fact that the tool enables the use of a social context, not limiting the case to its psychobiological context. Thus, the participants understand the extent of the role of nursing and identify with it:

> [...] *If I get the other instruments that we are used to nursing giving us, we can't have this partial view that is at the same time integrative, of noticing them all: the social, the proper health context, not forgetting about the general socio-economic context.*

Also highlighted were the dynamics of the learning process promoted by the tool, which can help to build an identity based on participation and mutual responsibility for the end result while maintaining greater autonomy:

> [...] *maybe some exercise even with the teacher's interface, more used by the student, because it is the student who is going to think* [...].

> [...] *if a student wants to set a target that he wants to reach, he can understand. The student learns, the learner.*

> [...] *if as a teacher of a nursing course I am not able access my student somehow so that he is interested in my discipline* [...], *I will not be true to what he needs to develop.*

In the category, 'community', which encourages learning by building a sense of belonging to a particular group, aspects became visible related to belonging to the profession in detriment to belonging to a CoP of learning. Thus, thematic statements were made on the visibility of nursing work:

> [...] I would see that the end result of each individual learning is that it is going to give visibility to the profession.

DISCUSSION

A CoP provides opportunities in a suitable environment for the processes of teaching and learning, but the positive experience and its effective use was only really seen when the community began functioning with an increase in participants[9]. This reflection set a limit to this study because the focus group participants were not in a CoP, although in the evaluation phase of usability and navigability of the prototype this functionality had been included.

By analyzing the statements of the participants who refer to the teacher's didactics in the meaning given to learning, it can be seen that the use of computational tools in pedagogical practice should be preceded by reflection on the challenge of this innovation for the learning and teaching process.

On the one hand, it is up to the teacher to understand the changes that involve teaching and learning when using a computational resource, seeking means to facilitate the process and building technical expertise[10]. On the other hand, the institutional and personal investment in training is essential, especially for those who use the tool for the first time with an educational purpose[18].

Although since the beginning of this century the need has been made very clear of the importance of getting familiar with IT resources and to apply them in everyday life and work, there has been a lack of contact by nurses and students with these tools and a visible lack of skills and computer knowledge, which contributes to insecurity when applying them to the nursing practice [11]. This problem can be one of the reasons why participants included in their statements the need for motivation and training, and refer to the sense of instability they felt when they were exposed to new instruments for teaching.

Researchers discuss the issues of motivation and training[11-12], when they consider that a virtual learning environment constitutes a viable tool for teachers to improve their pedagogic practices. It also prepares them to interact with students born in the digital age, who want changes not only in their words but in their conceptions and practices[11]. It also shows that prior to implementing new technologies and educational methods, students and teachers should be involved and motivated. This is of fundamental importance for organizing this pedagogical teaching mechanism[12].

The relationship between the themes of motivation and training demonstrates the importance of these two concepts for learning to occur in places of practice as well as in their relationship with the transformation of identity. A study that evaluated the perception of nursing students on an educational technology using serious games corroborated this statement. It concluded that the value of these technologies for students

leads to a reflection of the incorporation of innovative practices as a motivational tool for learning that requires greater theoretical knowledge by both the student and the teacher[1].

Upon establishing the relationship between systematization and reasoning as part of the sense of learning, what stands out is that this analogy may not be connected to a CoP experience, but instead its significance is included in the nursing student's training process and in that of the clinical teaching faculty. This fact was also highlighted by research that concluded that the negotiation of meanings is not limited to specific participation in a CoP, but involves participating in other forums in which the community members are part, and therefore the meaning is reached by a consensus among them, which is contextual and unique[13].

The incorporation of a CoP of learning, in principle, requires dialog and agreement of interests, which are not always convergent between teachers and students. The moments of conflicts experienced in this practice can contribute positively or negatively to the collective learning process[14]. Examples of situations of personal conflict can be seen in the phrases related to the prerequisites for using the tool and concerning relations with the group or institution, which, as they are worked through together in the CoP, can be opportunities for learning.

Another important point stressed by the participants was the development of clinical reasoning when preparing the ND, which is regarded as a challenge in nursing. Teachers and students understand that when the possibility to collect and interpret patient data is offered to the nursing student using the nursing process and a standardization of language, then the real need of nursing care is highlighted.

The literature discusses the failure of faculty to integrate the nursing process into learning experiences. This is sometimes related to the presence of extensive documentation of a care plan that requires little critical thinking, decreasing the likelihood of the use of ND by the student after graduation[15]. It is true that students find it difficult to associate the content covered in the classroom with the practice of preparing an ND due to fragmented information and disconnection from the reality of care. Meaningful learning strategies based on scientific and theoretical knowledge can encourage them to overcome this problem[16].

The nurse's role in the face of socially contextualized situations, enhancing their actions beyond the psychobiological, was related to the building and transformation of personal identity. A study that analyzed the role of nurses in the National Public Health System, particularly in the family health strategy, highlights nursing in the context of developing interactive and integrative practices[17]. Therefore, tools that can expose students to contexts where they discuss social intervention practices and focus on the complexity of the health-disease process are important means of learning and identifying the social role of nursing.

The use of technology as a medium that allows the teacher to act as an advisor and not as a driver, has as a condition the student's preparation for the sharing of knowledge in order to promote autonomous practices[18-19]. This logic was reinforced by statements from the participants when they understood that the incorporation of the CoP extends the participation and mutual responsibility as part of the process of strengthening personal identity.

Virtual learning environments require on the one hand the abandonment of a passive attitude, receptivity, and dependence by the student, and on the other hand, the application of cooperative didactics and methodologies by the teacher. These requirements can lead to a generation conflict that must be overcome by a paradigm shift in the perspective of an emancipatory education[20].

In the category of community, questions were raised related to belonging to the profession as opposed to belonging to a CoP. This was a study that discussed the formation of a CoP in the area of teaching chemistry[21] where the authors state that engagement, negotiation, and the sharing of topics led the group of students to learning which was related to their future profession.

Three aspects considered as important for creating a CoP a common goal, mutual commitment, and a shared set of concepts, tools, and language[22] are apparent in the statements of the teachers and students when they addressed the need for change in teaching practices incorporating mutual participation, with the addition of the concepts and methods related to the nursing process.

FINAL CONSIDERATIONS

When analyzing the SLT components identified in the prototype, it was possible to notice that learning can be expanded by the teacher's didactic through the meaning given to it. Elements such as motivation and training also appear to be essential for learning to occur as well as by the building and transformation of the identity of those using the tool.

The exercise of the nursing process using standardized language and the relationship between the systematization of the nursing practices and reasoning were identified as inherent parts of the learning components due to the meaning given to this process and its practice by these components.

Although personal and institutional prerequisites can be identified that can affect the learning process, the analysis done can serve as a basis for establishing a community of practice whose common goal is the desire to develop the reasoning process in the preparation of a nursing diagnosis.

This study promotes reflections about the importance of pedagogical theories in the process of building computational tools used in teaching and the need to improve the competencies and didactic and pedagogical skills for an effective use of digital technologies.

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REFERENCES

1. Fonseca LMM, Del' Angelo Aredes N, Dias DMV, Scochi CGS, Martins JCA, Rodrigues MA. Serious game e-Baby: nursing students' perception on learning about preterm newborn clinical assessment. Rev Bras Enferm [Internet]. 2015 Jan-Feb [cited 2015 Mar 31];68(1):13-9. Available from: http://www.scielo.br/pdf/reben/v68n1/en_0034-7167-reben-68-01-0013.pdf
2. Cogo ALP, Pedro ENR, Silva APSS, Schatkoski AM, Catalan VM, Alves RHK. Digital educational materials in nursing: assessment by professors from an undergraduate course. Rev Esc Enferm USP [Internet]. 2009 June [cited 2015 Mar 31];43(2):295-9. Available from: http://www.scielo.br/pdf/reeusp/v43n2/en_a06v43n2.pdf
3. Prado C, Vaz DR, Almeida DM. [Theory of significant learning: development and evaluation of virtual classroom in Moodle platform]. Rev Bras Enferm [Internet]. 2011 Nov-Dec [cited 2015 Mar 31];64(6):1114-21. Available from: http://www.scielo.br/pdf/reben/v64n6/v64n6a19.pdf
4. Silva M. Educação na cibercultura: o desafio comunicacional do professor presencial e online. Rev FAEEBA [Internet]. 2003 [cited 2015 Mar 31];12(20):261-72. Available from: http://www.uneb.br/revistadafaeeba/files/2011/05/numero20.pdf
5. Nichiata LYI, Padoveze MC, Ciosak SI, Gryschek ALFPL, Costa AA, Takahashi RF, et al . The International Classification of Public Health Nursing Practices - CIPESC®: a pedagogical tool for epidemiological studies. Rev Esc Enferm USP [Internet]. 2012 Jun [cited 2015 Mar 31];46(3):766-71. Available from: http://www.scielo.br/pdf/reeusp/v46n3/en_32.pdf
6. Cubas M, Albuquerque LM. O uso da Classificação Internacional para as Práticas de Enfermagem (CIPE®) e do inventário vocabular da Classificação Internacional das Práticas de Enfermagem em Saúde Coletiva (CIPESC®) como instrumento da consulta de enfermagem. In: Santos AS, Cubas MR, editors. Saúde Coletiva: linhas de cuidado e consulta de enfermagem. Rio de Janeiro: Elsevier; 2012. p. 77-94.
7. Wenger EC, Snyder WM. Communities of Practice: the organizational frontier. Hav Bus Rev [Internet]. 2000 Jan-Feb [cited 2015 Mar 31];78(1-2):139-45. Available from: https://hbr.org/2000/01/communities-of-practice-the-organizational-frontier
8. Fiorin JL. Linguagem e ideologia. 3. ed. São Paulo: Ática; 2005.
9. Cordenonzi W, Muller TJ, Amaral EH, Piovesan SD, Reategui EB, Tarouco LMR, et al. [Mobile Q: making a Community of Practice about Mobile Learning]. Rev Renote [Internet]. 2013 Jul [cited 2015 Mar 31];11(1):1-10. Avaliable from: http://www.seer.ufrgs.br/index.php/renote/article/view/41698/26450 Portuguese.
10. Silva JLM, Cursino EG, Vaz EMC, Almeida LF. Construção de site na internet sobre saúde da criança e do adolescente: contribuição para processo ensino-aprendizagem. Cienc Cuid Saúde [Internet]. 2007 Jul-Sep [cited 2013 Jan 22];6(3):363-71. Available from: http://periodicos.uem.br/ojs/index.php/CiencCuidSaude/article/view/4026/2718
11. Costa PB, Prado C, Oliveira LFT, Peres HHC, Massarollo MCKB, Fernandes MFP, et al . Digital fluency and the use of virtual environments: the characterization of nursing students. Rev Esc Enferm USP [Internet]. 2011 Dec [cited 2015 Mar 31];45(Spec No):589-94. Available from: http://www.scielo.br/pdf/reeusp/v45nspe/en_v45nspea08.pdf
12. Gomes AVO, Santiago LC. [Interactive multimedia in nursing a technology for teaching-learning Semiology]. Rev Gaúcha Enferm [Internet]. 2008 Mar [cited 2015 Mar 31];29(1):76-82. Available from: http://seer.ufrgs.br/index.php/RevistaGauchadeEnfermagem/article/view/5283/3003 Portuguese.
13. Cyrino MCCT, Caldeira JS. [Processes of negotiation of meanings on algebraic thinking in a community of practice of preservice mathematics teacher education]. Investigações Ensino Ciências [Internet]. 2011 [cited 2015 Mar 31];16(3):373-401. Available from: http://www.if.ufrgs.br/ienci/artigos/Artigo_ID268/v16_n3_a2011.pdf Portuguese.
14. Ellery ACL, Pontes RSJ, Loiola FA. [Community of practice as a collective way of learning and development of practices and knowledge of the family health strategy: a theoretical study]. Rev Bras Promoç Saúde [Internet]. 2012 [cited 2015 Mar 31];25(2 Suppl):104-12. Available from: http://ojs.unifor.br/index.php/RBPS/article/view/2251/2478 Portuguese.
15. Carpenito-Moyet LJ. Invited paper: teaching nursing diagnosis to increase utilization after graduation. [Internet]. 2010 Jul-Sep [cited 2015 Mar 31];21(3):124-33. Available from: http://www.ncbi.nlm.nih.gov/pubmed/20646090
16. Silva AGI, Peixoto MAP, Brandão MAG, Ferreira MA, Martins JSA. [Nursing students' difficulties in the learning of diagnostics in nursing, in a metacognitive perspective]. Esc Anna Nery [Internet]. 2011 Jul-Sep [cited 2015 Mar 31];15(3):465-71. Available from: http://www.scielo.br/pdf/ean/v15n3/a04v15n3.pdf Portuguese.
17. Backes DS, Backes MS, Erdmann AL, Buscher A. [The role of the nurse in the Brazilian Unified Heath System: from community health to the family health strategy]. Ciênc Saúde Colet [Internet]. 2012 Jan [cited 2015 Mar 31];17(1):223-30. Available from: http://www.scielo.br/pdf/csc/v17n1/a24v17n1.pdf Portuguese.
18. McGowan BS, Balmer JT, Chappell K. Flipping the Classroom: a Data-Driven Model for Nursing Education. J Contin Educ Nurs [Internet]. 2014 [cited 2015 Mar 31];45(11):477-8. Available from: http://www.ncbi.nlm.nih.gov/pubmed/25365182
19. Dal Sasso GTM, Souza ML. [Computer-assisted simulation: convergence in the process of education and care in nursing]. Texto Contexto Enferm [Internet]. 2006 Apr-Jun [cited 2015 Mar 31];15(2):231-9. Available from: http://www.scielo.br/pdf/tce/v15n2/a05v15n2.pdf Portuguese.
20. Amarilla Filho P. [Long distance education: a methodological approach of teaching from virtual environments]. Educ Rev [Internet]. 2011 Aug [cited 2015 Mar 31];27(2):41-72. Available from: http://www.scielo.br/pdf/edur/v27n2/a04v27n2.pdf Portuguese.

21. Santos VC, Arroio A. [Teacher training in communities of practice: the case of a group of pre-service chemistry teachers]. Quim Nova [Internet]. 2015 [cited 2015 Mar 31];38(1):144-50. Available from: http://quimicanova.sbq.org.br/imagebank/pdf/v38n1a22.pdf Portuguese.

22. Antonello CS, Ruas R. Formação gerencial: pós-graduação lato sensu e o papel das comunidades de prática. Rev Adm Contemp [Internet]. 2005 Apr-Jun [cited 2015 Mar 31];9(2):35-58. Available from: http://www.scielo.br/pdf/rac/v9n2/v9n2a03.pdf