

# Problem-Based Learning *in Situ* Applied to Students in the Assessment of Nursing Process

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## Abstract

**Background:** Nursing is considered a science in the making that recognizes the nursing process (NP) as the scientific and methodological tool to provide care. The NP is composed of five stages of which the assessment is the first and fundamental to identify the health problems of the people. This research aimed to evaluate a pedagogical didactic strategy that is based on situated constructivism, the Based-Problem Learning (BPL), in order to improve significant learning. **Methods:** Quantitative research with an explanatory scope, was transversal, and it was applied to 30 students of the first year of the nursing career at the Faculty of Higher Studies Iztacala, National Autonomous University of Mexico. The sample was chosen considering the inclusion criteria. Data were collected using a Likert-type instrument validated in a previous investigation. **Results:** The average value obtained from the Likert scale to evaluate the intervention was 103.4, the highest score was 135 and the lowest was 83, which reflects that it was evaluated as good and particularly good. The grade given to the teacher as an agent of the ZPD, was between agree and totally agree, the highest percentages scored at 93%, since it provoked challenge in their thinking, and favored interaction among classmates. **Conclusions:** The application of the *in situ* teaching strategy, BPL favored significant learning of the assessment stage, the students were able to carry out the assessment in the hospital, the experience contributed to generate significant learning when students face real scenarios, which showed the effectiveness of the method.

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## Keywords

Learning Method, Nursing Process, Assessment

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### 1. Introduction

Nursing process (NP) is an own method of nurse professionals, that explains and describes how to apply the scientific method to healthcare practice. By using this method nurse professionals provide rational, dynamic, and conscious decisions care, also logics to solve problems, priorities definition, and decisions taken to get better ways for health care. The NP originated from the theoretical basis proposed by Florence Nigthingale in the XIX century, it integrates nursing knowledge with epistemological elements such as person, surroundings, health and care, nursing philosophies, models and theories and empirical indicators used in the different steps of nursing process [1]-[7].

Due to its importance and significance NP has been studied from different views, like its teaching and application is a complex process to apply in clinical scenarios [8] [9] [10] [11] [12], where diverse situations occur that impair NP's objectives. Then nursing educational institutions search for the best teaching method [6] [7] [11] [13] [14]; however, no specific teaching method for NP assessment has been studied, even though it is a cornerstone of the process [1] [2] [3] [4] [5].

It was considered that in the teaching-learning process of assessing the main figure is the student, and the teacher acts as a facilitator [12] [15], and it was based on psychological, pedagogical, and philosophical theories of Vygotsky, Díaz Barriga and Sartre, respectively.

It is unquestionably that nurse professionals rely on Vygotsky's theories, they are trained into a social surrounding and share among peers, and guided by other professionals involved in significant activities who apply concepts like zone of proximal development (ZPD) to learn, such as student and teacher situation in a joint action toward defined goals, where the teacher acts a resource available to the student that helps to reach better learning than that self-acquired [16] [17] [18].

Vygotsky's theory focuses on social interaction that surrounds the individual, which leads to knowledge and essential skills for success in a particular culture. It does not consider the person as an independent explorer making decisive discoveries on his own, but instead sees the person in cognitive development as an activity mediated by society. ZPD is the process in which an expert, when instructing a novice in a situation of learning, responds in a contingent way to the behavior of the latter, so that little by little you know the problem better, with freedom of learning based on the next zone of development [16] [17].

Renkl and Ku & Ha referred that all knowledge as a product of learning or thinking-cognition actions, could be defined as being situated in the context of a

determined situation and results from a person's learning activity by interacting with others, in a sense of social practices promoted from a determined community [19] [20].

The situated cognition paradigm is one of the most representative and promising current tendencies of sociocultural theory and activity; it does assume diverse shapes and names, directly linked to concepts such as situated learning, legitimate peripheral participation, cognitive apprenticeship or craft learning. The situated teaching is an *in situ* learning method, considered as a strategy based in socio-constructivist that resumes aspects of Vygotsky's theory, regarding that learning is learnt in persons' social contexts and their interactions, it resumes the cognitive constructivism paradigm because is a product of learning or thinking-cognition acts, from the social settings [13] [16] [17] [18].

*In situ* learning is based on the contemporary model of situated cognition, *i.e.*, apprenticeship model, which seeks to develop skills and knowledge of the nursing profession, as well as their participation to solve social problems or the pertaining community. It emphasizes the usefulness or functionality of the learned subject, as well as learning in real settings [16] [17] [18].

Nursing teaching-learning is a training process higher than 70% learnt in real settings, right with persons requiring care. First there is contact with persons or simulators to approach that reality, and then they integrate it in hospital units of the three attention levels, such that there is a continuous social and cognitive interaction with teachers and peers which improve personal knowledge construction, and particularly the joint construction with peers and those subjects of care. This process is guided, supervised and feedback by a nurse teacher, with an approach and application of Vygotsky's DPZ, elements to chose the strategy which explains the pedagogic and psychological trends supporting it [16] [19] [20] [21] [22]. The aim of the study was to evaluate a didactic-pedagogic strategy supported in a situated constructivism principle, *i.e.*, an *in situ* learning method, BPL that will contribute to improving significant learning during the assessment of NP, for a better quality in nursing students learning at FESI-UNAM.

## 2. Methods

An exploratory study was conducted to approach reality and obtain information, recognize, locate and define problems that allow refine the method [23]. Quantitative research with an explanatory and transversal scope. Explanatory research accounts reality or its comprehension through scientific theories, elucidate which factor facts-associated determine the observed response, and the accuracy of dependent and independent variables relationships [23]. The current study explained how significant learning occurred in the assessment of nursing step applying the situated teaching, PBL. The study was transversal with one measurement to seek students' learning, and the significant learning progress in estimating NP. The epistemological frame for this study was revised from general and specific aspects, considering the axiological aspect as important and relevant for

nursing students and teachers in the situated teaching, the PBL as a support to improve significant learning for the assessment of NP. The ontological aspects were related to social surroundings, the nature of investigation taken in account that nurse student acquired significant learning, which resulted in care quality for professional activity. The epistemological aspects pertained to whom and what, and were considered to explain that nurse students were studied regarding situated teaching, PBL as a support of significant learning in the assessment of NP. The theoretical basis were Vygostky's sociocultural theory [16] [17], Diaz-Barriga's situated constructivism theory [18] [19], and Sartre's existentialism [12] [15] [24].

### 2.1. Inclusion Criteria

First year nursing students from Facultad de Estudios Superiores Iztacala, Universidad Nacional Autónoma de México. The educational strategy was carried out in first-year students, aiming for an impact on their learning, and it is in this period that they first meet the nursing assessment, and that it would be reinforced throughout the professional training.

### 2.2. Universe Sample

From a universe of 300 nursing students of a public university, a simple of 30 subjects that met inclusion criteria were invited to participate. The sample included 26 women and 4 men.

### 2.3. Information Gathering

A questionnaire of 27 items was the instrument used to evaluate the strategy, with a Likert type scale (Strongly disagree, Disagree, Neither agree nor disagree, Agree, Strongly agree), based in the *in situ* method Problem-Based Learning PBL, as support and improvement of thinking abilities [18] [25], considering the following items (Table 1):

- Professor as development zone agent (ZPD) (9 items);
- Student's performance (7 items);
- Course organization (11 items).

### 2.4. Procedure

*In situ* method PBL for teaching and learning during assessment of NP consisted in the following: students were in direct contact with assigned persons, doing physical exploration of human body systems, which is part of the assessment of NP. The strategy was conducted in the classroom, in nurse's laboratory and in the hospital, having the instruments and materials for each session. The process lasted 80 hours along 8 weeks; in the first week the theoretical support of the

**Table 1.** Instrument.

Item	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
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assessment step (vital signs, somatometry, perimetry) was revised. Throughout the second and third weeks the clinical history, the physical exploration, behavior, and general aspects were evaluated; during the fourth week the nursing diagnosis, NANDA, planning, execution and evaluation [9]. In the fifth week the physical exploration of nervous, tegumentary, musculoskeletal, and cardiovascular systems; during the sixth week the physical exploration of respiratory, digestive, genitourinary, and urinary systems were evaluated. In the seventh week the physical exploration of an external person, and in the eighth week the physical exploration of a person in the hospital were done. The instrument was applied at the end of programming.

## 2.5. Data Analysis

Analysis and processing of the study data were done with the statistical package SPSS, version 20. Results of the instrument evaluating teacher's intervention as a ZPD, student's performance and course organization, considered the highest score as 135 and the lowest score as 27 (**Table 2**).

## 2.6. Ethics and Legal Aspects

Ethics and legal aspects were based on the principles of the Declaration of Helsinki, point 6 "The right to safeguard the integrity of persons must always be respected. All needed precautions must be adopted to respect intimacy of persons, reduce to a minimum the impact of the study on their physical, mental and personality". An informed consent letter was signed by each informer according to the Nüremberg code and local law [25] [26] [27].

## 3. Results

The educational strategy was carried out in several sessions, which required continuous monitoring and counseling by the researcher to maintain control of the implementation, to do that a limited number of participants were chosen. On the other hand, the exploratory research reflected that the rest of the teachers did not know the method *in situ*, which prevented the implementation of the strategy on their part. The sociodemographic characteristics of the participants are presented in (**Table 3**).

The Likert's scale obtained average for intervention was 103.4, being 135 the highest value and 83 the lowest value, meaning that it was evaluated as good and

**Table 2.** Instrument's score.

Score	Evaluation
0 - 27	Deficient
28 - 61	Regular
62 - 95	Good
95 - 135	Very good

**Table 3.** Sociodemographic characteristics of the participants.

Age	
20 - 21 years	89%
19 - 20 years	10%
Over 21 years	1%
Sex	
Female	87%
Male	13%
Work experience	without work experience
Civil estatus	
Single	99%
Married	1%
Student	
Regular	90%
Irregular	10%

very good. The grade given to the teacher as a ZPD agent was between agree and strongly agree, the highest scored 93% since it provoked challenge in their thinking and favored interaction between classmates (**Figure 1, Table 4**).

#### 4. Discussion

There are a number of definitions for the nursing process; however, in the current study Acosta-Salazar's *et al.* definition was used [28], in which NP is a "systematic and organized method to manage integral and progressive nursing care, centered in identification and treating the responses to health needs" [28]. Nursing process observed the scientific method steps, which supports the theoretical structure that led to knowledge and acted as a professional guidance. It is a model that underlies the professional nursing care, to engage the scientific knowledge and research, the professional work and it must be present at the beginning of the nursing professional training, accompanied by teachers along the program to reach the objectives, which coincided with the highest score for teachers as agents of ZDP, since they promoted a challenge in students' thinking and favored their interaction. This showed the importance of teachers encouraging innovative pedagogic strategies in the teaching-learning process, to search for significant learning such as PBL. According to Ku & Ha, and Morales-Bueno, PBL allows nursing students to integrate theory and practice in every context [20] [29]. Those authors raised that PBL involves constructivist ideas such as learn how to learn, collaborative work in small teams, and solving real problems; it provides the base to exchange ideas, team work and the chance to synergize communication and management abilities. It also allows the cultural and social interactions among students; while the complete evaluation of the situated teaching,

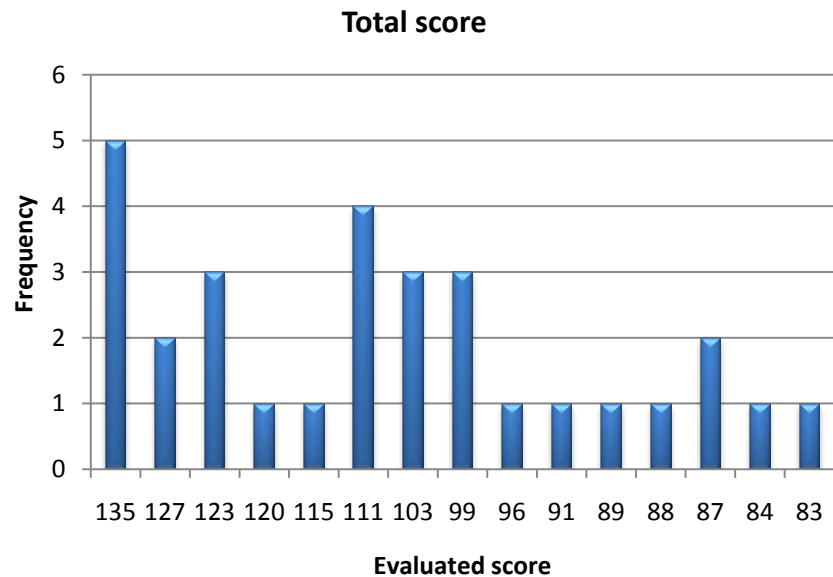
**Table 4.** Opinion of the students in the learning of the: “NP assessment stage”.

Item	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
<b>Teacher as Zone of Proximal Development Agent</b>					
1.-The professor’s teaching skills favored a meaningful learning process				30%	70%
2.-The professor taught through interaction, constant feedback and by sharing their knowledge				20%	80%
3.-The professor stimulated classmate interaction				10%	90%
4.-The professor stimulated the development of communication and interaction skills between classmates and tested people				17%	83%
5.-The professor maintained group dynamics during the demonstration of nursing assessment				33%	67%
6.-The professor stimulated the analysis of cases and critical thinking			3%	37%	66%
7.-The professor stimulated the performance of procedures and enforced them by repetition			3%	14%	83%
8.-The professor integrated the assessment stage in the nursing clinical history				10%	90%
9.-The professor incited challenges in the thinking process				7%	93%
<b>Student’s Performance</b>					
10.-Work dynamics incited the need to use reflective and analytical thinking in me				23%	77%
11.-The way of working encouraged me to work collaboratively			7%	23%	70%
12.-My performance, enthusiasm and commitment were factors that positively influenced the learning of the assessment stage of the nursing care process				30%	70%
13.-The assessment stage allowed me to identify people’s health problems and needs				27%	73%
14.-I was able to identify my cognitive and procedural learning needs while making the nursing assessment				27%	73%
15.-The situated teaching strategy <i>in situ</i> method allowed me to identify the learning needs that I must strengthen				30%	70%
16.-The teaching method led me to think about the consequences of my professional nursing actions				20%	80%
<b>Course Organization</b>					
17.-At the beginning of the session, there was an adequate schedule			3%	47%	50%
18.-The development of the session was carried out with the sequence required to for the nursing assessment				40%	60%
19.-The final integration practices allowed you to evaluate your learning				3%	97%
20.-The different scenarios chosen for learning the assessment stage facilitated it				10%	90%
21.-The times destined for each session allowed the achievement of what was planned			3%	40%	57%
22.-The session objectives were met				30%	70%
23.-Working with this methodology allowed me to generate new ideas to deal with the classes				33%	67%

**Continued**

24.-I opened up to the idea that this method can be useful for the implementation of the nursing process		13%	87%
25.-I would recommend this learning method to other colleagues	3%	27%	70%
26.-Learning the assessment stage allowed me to give importance to the nursing process as a nurse		10%	90%
27.-The transition between steps of the process was logical and natural		33%	67%

Source: data obtained after applying the Likert scale to a nurse group in FESI-UNAM.



**Figure 1.** Total score to evaluate the intervention. Source: data obtained after applying the Likert scale to a nurse group in FESI-UNAM.

the method of *in situ* learning PBL applied in the strategy showed that 97% and 93% agreed or strongly agreed, translated to the efficacy of the method to support significant learning during NP assessment.

According to Andrade Cepeda NP features highlight that it is an open and flexible method, since it satisfied individual needs, family needs and community needs, it is a cyclic and dynamic process because each step is interrelated, it is centered in the user and satisfies particular needs. It does have a concrete and programmed purpose, and it is interactive so that assumes a relationship between nurse and cared person [5]. By seeking the purpose to give individualized and specific care with a theoretical support, it is used as a basic structure to attend any given health situation along the life of the person; which agrees with the finding that 80% students mentioned that PBL led them to think about their professional acting as nurses and 77% referred that work dynamics generated the need to use analytic and reflexive thinking, supported in significant learning. Hung and Lin determined that PBL had a strong effect in knowledge acquisition and integration in a quasi-experimental study, and it potentiated motivation and significant learning in nursing students [30].



Among the goals of NP it is highlighted that it stimulated observation ability, professional growth, abilities development, active interaction between nurse and patient. It prevented omissions and repetitions, and promoted a better professional communication, which is coincident with the finding of 73% students mentioned that NP assessment allowed to identify problems and health needs of persons. According to Carpenito there is a growing interest in the diagnostic phase of NP, since nursing care efficacy depended of the ability to identify patient's diagnostics or potential problems; at the same time, the efficacy in identifying problems, intellectual abilities like critical and creative thinking, problem solving and decisions taken, depended of the full evaluation and interpretation of the obtained data in this step [31] [32].

The proposal seeks integration of to know, to do, and to act in nursing students in the assessment of nursing process step, to contribute for significant learning in students [33].

The results obtained in the research may suggest the use of the PBL method to improve the learning of nursing assessment; however, it is necessary to continue doing research in this regard, given the disciplinary importance of the subject in the professional life of the nurse.

## 5. Conclusions

Applying the *in situ* teaching strategy PBL favored significant learning during the assessment step, since students significantly assessed human body systems with a hospitalized patient; the experience contributed to significant learning because students face real scenarios, based on Vygotsky's, Díaz-Barriga's and Sartre's theories.

## Limitations of the Study

Teachers did not know the situated teaching *in situ* PBL method.

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## Authors' Contributions

The authors collaborated for the research. MAP, JRHH advised the design of the protocol and drafted the manuscript, DCTP and RVM processed the manuscript for publication. JLCA, RMOM, MPIG, collected and analyzed the data. All the authors read and approved the final manuscript.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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