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Teaching-learning evaluation on the ICNP® using virtual learning environment

Avaliação do ensino-aprendizagem sobre a CIPE® utilizando o Ambiente Virtual de Aprendizagem
La evaluación de la enseñanza-aprendizaje sobre la CIPE® a través del ambiente virtual de aprendizaje

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ABSTRACT

Objective: Evaluating the teaching-learning process of undergraduates and nursing professionals on the International Classification for Nursing Practice (ICNP®) through a course on Moodle Platform. **Method:** Mixed research conducted with 51 nursing students and nurses. Many technological and educational resources were used. To collect data, two semi-structured questionnaires were applied and focus groups were carried out. Statistical and thematic analysis of the data was performed. **Results:** There was a correlation between the Wiki variable, the Animation Video ($p = 0.002$) and the Arch Method ($p = 0.04$), as well as a correlation between the Forum, the Virtual Book ($P < 0.001$) and time ($p = 0.009$). Three topics emerged: innovation in the application of technological resources, distance education in the professional education and permanent education and the teaching-learning process on the ICNP® in a collaborative way. **Conclusion:** Teaching-learning strategies and technological resources used were pointed out as innovative and helped students have a better performance.

Descriptors: Education, Distance; Educational Technology; Education, Nursing; Education, Continuing; Nursing Care.

RESUMO

Objetivo: Avaliar o ensino-aprendizagem de graduandos e profissionais de enfermagem sobre a Classificação Internacional para a Prática de Enfermagem (CIPE®) por meio de um curso na Plataforma Moodle. **Método:** Pesquisa mista realizada com 51 graduandos de enfermagem e enfermeiros. Utilizaram-se diversos recursos tecnológicos e educacionais. Para a coleta de dados foram aplicados dois questionários semiestruturados e realizados grupos focais. Procedeu-se à análise estatística e temática dos dados. **Resultados:** Houve correlação entre a variável Wiki com o Vídeo de Animação ($p = 0,002$) e com o Método do Arco ($p = 0,04$) e do Fórum com o Livro Virtual ($P < 0,001$) e com o tempo ($p = 0,009$). Três temas emergiram: inovação na aplicação de recursos tecnológicos, educação à distância na formação profissional e educação permanente e o processo de ensino-aprendizagem sobre a CIPE® de forma colaborativa. **Conclusão:** As estratégias de ensino-aprendizagem e os recursos tecnológicos utilizados foram apontados como inovadores e auxiliaram no melhor desempenho dos alunos.

Descritores: Educação à Distância; Tecnologia Educacional; Educação em Enfermagem; Educação Continuada; Cuidados de Enfermagem.

RESUMEN

Objetivo: Evaluar la enseñanza-aprendizaje de universitarios y profesionales de enfermería sobre la Clasificación Internacional para la Práctica de Enfermería (CIPE®) a través de un curso en la plataforma Moodle. **Método:** Estudio de tipo mixto, del cual participaron 51 estudiantes de enfermería y enfermeros. Se emplearon varios recursos tecnológicos y educacionales. Para la recolección de datos se emplearon dos cuestionarios semiestructurados aplicados en grupos de discusión. Luego se realizó el análisis estadístico y temario de los datos. **Resultados:** Se presentó correlación entre la variable Wiki con Animación de video ($p = 0,002$) y con el Método del Arco ($p = 0,04$), así como el Foro con el Libro virtual ($p < 0,001$) y el tiempo ($p = 0,009$). Surgieron tres temas: innovación en la aplicación de los recursos tecnológicos, educación a distancia en la formación profesional y educación permanente y el proceso

ensinanza-aprendizaje sobre la CIPE® de forma colaborativa. **Conclusión:** Se consideraron innovadoras las estrategias de enseñanza-aprendizaje y los recursos tecnológicos utilizados, pues también contribuyeron para un buen rendimiento de los estudiantes.

Descriptores: Educación a Distancia; Tecnología Educacional; Educación en Enfermería; Educación Continua; Atención de Enfermería.

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INTRODUCTION

The use of Information and Communication Technologies (ICT) has been intensified nowadays, especially on education, which has provided great benefits to the learning process in nursing⁽¹⁾. Computers in the nursing knowledge field has been used since 1950, with a huge documentation on possible benefits to the profession, particularly in the United States of America. In the Brazilian context, first experiments towards nursing education field occurred around 1985; However, this technology incorporation into teaching is still under development⁽²⁾.

ICTs contributed to advances in the use of computers, internet and, consequently, for education, with the introduction of the distance education modality (DE)⁽³⁾. This modality occurs within an area named Virtual Learning Environment (VLE). Combined with use of technological resources, the VLE has provided a more interactive, reflective, collaborative and problematizing learning, having the teacher as a collaborator in this process. Moodle Platform is a free use and costless VLE which allows inclusion of various technological resources, which justified its choice for this study⁽¹⁾.

Advances in the use of ICTs applied to health education and, particularly, to professional nursing education and permanent education of nurses, is the reason why we intended to conduct this study in the knowledge field of nursing care methodology; more specifically, the International Classification for Nursing Practice (ICNP®). Permanent Education in Health (PEH) can be understood as an education process of health workers starting from educational background needs, aiming at transforming assistance practices⁽⁴⁾.

ICNP® is a classification with a worldwide standardized terminology that aims to express the elements of the professional nurse clinical practice. Use of nursing classifications seeks to meet the Resolution number 358/2009 of the Federal Council of Nursing (COFEN), which recommends nursing process should be performed in all environments where care of professional nurses occurs. Nursing process is the basis for systematization of nursing assistance⁽⁵⁾. However, we have noticed there is a gap in the literature concerning scientific knowledge produced about the teaching of this classification, especially in nursing distance education modality⁽⁶⁾.

Thus, the objective of this study was to evaluate teaching-learning process of nursing undergraduates and nursing professionals about the ICNP®, using the VLE – Moodle platform.

METHOD

Ethical aspects

This study was approved by the Research Ethics Committee of the Federal University of Alfenas (UNIFAL-MG).

Study design, location, and period

This is a mixed or mixed methods' research, in which there was a combination of quantitative and qualitative approach elements, in order to increase and deepen knowledge and its corroboration. It was carried out in UNIFAL-MG with 51 participants, subdivided into two groups: 26 professionals (Family Health Strategy nurses of Alfenas/MG, Master's students and Family Health residents of UNIFAL-MG) and 25 nursing students of UNIFAL-MG, from August to December 2014.

Sample, inclusion and exclusion criteria

Selection of participants was carried out through personal invitations in the classrooms and in Family Health Units (FHU). Distribution of participants was performed through simple random probability sampling. Inclusion criteria were: nurses who work at FHU; who were performing their work activities; resident nurses active in the program; Master's students enrolled in the second semester of 2014; and nursing students of the 4th, 6th and 8th semesters; regularly enrolled in the second semester of 2014; aged 18 or older; regardless of gender. Exclusion criteria were professionals who were on vacation or health treatment leave, and undergraduates who were performing a curricular internship in another municipality or on health treatment leave.

Study protocol

In the Moodle Platform, a course entitled "Course on Nursing Diagnoses, Interventions and Outcomes using the ICNP® in the Virtual Learning Environment" was developed. This course was formed by six teaching units: on Unit 1, the first questionnaire on sociodemographic assessment, computerization and internet use and knowledge about the nursing process, assistance systematization and the ICNP® was provided; on Unit 2, students participated on first text construction through Wiki, a Moodle platform resource which allows writing of collaborative texts. A fictitious clinical case about a home visit was offered and participants were supposed to build the clinical reasoning from the knowledge they had on the subject; on Unit 3, a support textbook in virtual format and the Discussion Forum were provided. On this Unit, students participated in the Forum based on the textbook. The Forum was conducted by two tutors with experience in the subject; on Unit 4, the second Wiki was elaborated, with a second clinic case guided by the Maguerez Arch Method pedagogical strategy⁽⁷⁾ for data collection steps and nursing diagnoses, interventions and outcomes, according to the ICNP®.

On Unit 5, the third Wiki was elaborated through a clinical case given by an animation video so that students could develop a collaborative text using the same logic of the second

Wiki; finally, on Unit 6, the second assessment questionnaire was provided regarding the VLE course and the technological and educational resources used. It should be noted that, during the course, the two groups were kept completely separate on the Moodle Platform and also in the three in-person meetings.

Results and statistics analysis

For statistical analysis, the Statcal Package for Social Sciences program, version 17.0 was used. Descriptive statistics allowed to present and summarize the obtained data. Spearman correlation coefficient was used to correlate ordinal variables, the Chi-square test for chi-squared distribution of probability and the Mann-Whitney test for categorical and numeric variables. A 5% significance level was established.

Qualitative data analysis

For qualitative data collection, focus groups were carried out at the end of the course, divided into professionals and undergraduates, with nearly 12 participants each, in order to discuss and exchange experiences on the subject and the educational resources used. The focus groups' discussion average duration was 50 minutes, and was driven by the last author as a facilitator, while the field diary was written by the first author during interviews. The answers were transcribed, read and analyzed using content analysis and theme modality⁽⁸⁾, grounded by use of new technologies in distance education and constructivist learning⁽⁹⁾. Three topics emerged: innovation in application of technological resources, distance education for professional education and permanent education; teaching-learning process on the ICNP® in a collaborative way.

RESULTS

Among the 51 participating subjects, 47 (92.2%) belonged to the female gender, 32 (62.7%) were from other municipalities and 32 (62.7%) finished High School at public schools. The average age of participants was 29 (SD = 9.08), being 34 (SD = 9.52) in Group 1 and 23 (SD = 3.65) in Group 2. Among the 26 professional nurses, Group 1, 21 (80.8%) have already worked in their field, and their average experience was 8 years (SD = 9.87).

Table 1 presents characteristics about computerization and internet use for nurses and nursing students.

All participants reported to access the internet, with average usage of three and a half hours per day (SD = 2.08).

Table 2 presents the characterization of nurses and nursing students regarding nursing process knowledge (diagnoses, interventions and outcomes) and nursing classifications.

After finishing the course on the Moodle Platform, the participants were asked to assess the technological resources and educational strategies used. Table 3 presents this evaluation.

When asked about the most motivating educational strategy for clinical case presentation, 46 (90.2%) preferred the animation video and 5 (9.8%) the written format. Regarding the available time to carry out activities, 2 (3.9%) considered unsuitable; 8 (15.7%), little suitable; 30 (58.8%), suitable; and 11 (21.6%), very suitable.

Table 1 - Distribution of participants according to computerization characteristics and internet usage, Alfenas, Minas Gerais, Brazil, 2015

| Variables | f | % |
|--|----|------|
| Computer course | | |
| Yes | 30 | 58.8 |
| No | 21 | 41.2 |
| Computer Equipment* | | |
| Notebook | 45 | 88.2 |
| Smartphone | 20 | 39.2 |
| Microcomputer | 14 | 27.5 |
| Internet access at home | | |
| Yes | 50 | 98 |
| No | 1 | 2 |
| Most used location for internet access | | |
| Home | 41 | 80.4 |
| Work | 5 | 9.8 |
| University | 5 | 9.8 |
| Internet main uses* | | |
| Study | 47 | 92.2 |
| Leisure | 33 | 64.7 |
| Work | 19 | 37.3 |
| Online course | 17 | 33.3 |
| Social media* | | |
| Facebook | 48 | 94.1 |
| Whatsapp | 37 | 72.5 |
| Instagram | 22 | 43.1 |
| Twitter | 6 | 11.8 |
| Others | 5 | 9.8 |
| VLE use for permanent education or subject | | |
| Yes | 40 | 78.4 |
| No | 11 | 21.6 |
| Moodle Platform Knowledge | | |
| Yes | 46 | 90.2 |
| No | 5 | 9.8 |
| Knowledge of Moodle resources* | | |
| Forum | 35 | 68.6 |
| Virtual Library | 30 | 58.8 |
| Wiki | 17 | 33.3 |
| Others | 7 | 13.7 |
| None | 6 | 11.8 |

Note: *Items with more than one response; VLE – Virtual Learning Environment.

Participants qualified the obtained knowledge level after finishing the course, concerning nursing diagnoses, interventions and outcomes, using the ICNP® as: 6 (11.8%), very high; 36 (70.6%), high; 8 (15.7%), little and 2 (2%) very little. Moreover, 47 (92.2%) would like to use the VLE as a strategy for teaching and learning in other courses and subjects.

According to the Chi-square test, the "knowledge acquired about the ICNP®" presented significant association with the most motivating educational strategy for clinical case presentation" ($p = 0.01$), indicating that those who qualified their knowledge level as high, considered the animation video more motivating than expected.

The variable "preference for using VLE as a teaching and learning strategy in other courses and subjects" was associated with the "animation video evaluation" ($p = 0.001$), with a higher number of people who would use VLE in the response "very

Table 2 – Distribution of participants according to prior knowledge about nursing process and nursing classifications, Alfenas, Minas Gerais, Brazil, 2015

| Variables | f | % |
|---|----|------|
| Nursing diagnoses, interventions and outcomes | | |
| Yes | 48 | 94.1 |
| No | 3 | 5.9 |
| Knowledge level | | |
| Very high | - | - |
| High | 10 | 20.8 |
| Moderate | 18 | 37.5 |
| Little | 14 | 29.2 |
| Very little | 6 | 12.5 |
| Nursing classifications | | |
| Yes | 27 | 52.9 |
| No | 24 | 47.1 |
| ICNP® | | |
| Yes | 13 | 25.5 |
| No | 38 | 74.5 |
| Knowledge level | | |
| Very high | - | - |
| High | - | - |
| Moderate | 5 | 38.5 |
| Little | 2 | 15.4 |
| Very little | 6 | 46.1 |

Table 3 – Percentage distribution of participants in the evaluation of educational strategies used, Alfenas, Minas Gerais, Brazil, 2015

| | Unsuitable | Little suitable | Suitable | Very suitable |
|-----------------|------------|-----------------|-----------|---------------|
| | f (%) | f (%) | f (%) | f (%) |
| Animation video | - | 1 (2) | 11 (21.6) | 39 (76.5) |
| Wiki Resource | - | 1 (2) | 19 (37.3) | 31 (60.8) |
| Forum Resource | - | 1 (2) | 21 (41.2) | 29 (56.9) |
| Textbook | - | - | 24 (47.1) | 27 (52.9) |
| Arch Method | - | 1 (2) | 32 (62.7) | 18 (35.3) |

Table 4 – Spearman correlation coefficients among some ordinal variables of the study, Alfenas, Minas Gerais, Brazil, 2015

| Variables | Correlation coefficient | p value |
|--------------------------------------|-------------------------|---------|
| ICNP® versus textbook | 0.334 | 0.016 |
| ICNP® versus Wiki resource | 0.282 | 0.045 |
| ICNP® knowledge versus arch method | 0.343 | 0.014 |
| Wiki resource versus animation video | 0.428 | 0.002 |
| Wiki resource versus arch method | 0.284 | 0.044 |
| Forum Resource versus activity time | 0.369 | 0.009 |
| Forum resource versus textbook | 0.531 | < 0.001 |

suitable for the animation video,” and by the Mann-Whitney test, with “age” ($p = 0.01$), indicating that the median of ages was higher for those who “would like to use VLE in other courses”.

Using the Spearman correlation coefficient, the following results were obtained, as demonstrated on Table 4.

Qualitative analysis of the empirical material allowed identification of three topics: innovation in application of technological resources; distance education for professional and permanent education; teaching-learning process on the ICNP® in a collaborative way.

In the first topic, teaching strategies and technological resources used in the teaching-learning process about the ICNP® were highly rated by students and pointed out as innovative. The Moodle platform resources must be highlighted, since they were mentioned several times during the discussion.

[...] I think the Forum was the decisive part to retain the ICNP®. (P37G2)

[...] I think the wiki part was very useful, we could write a collaborative text [...]. (P20G1)

The forum resource enabled, even at a distance, interaction among students, enabling a collective construction of knowledge regarding the nursing process and the ICNP®, based on the support textbook, in addition to provide learning attached to life, as participants expressed their work experiences.

[...] I think it is essential, I think one of the things I liked the most was precisely this interaction process. Because people asked questions and others answered, and we could see some understood things in a way and others in another [...]. (P7G1)

The Wiki resource enabled collective and collaborative construction of nursing diagnoses, interventions and outcomes, according to the clinical reasoning of each participant, retaking the collective authorship concept.

[...] We could do a collaborative text, learned to work in teams. Sometimes I forgot something that a peer remembered, sometimes a peer would put an important point that I had not found. This part was very useful. (P20G1)

Diversity of offered resources being well evaluated by the participants is something worth mentioning.

[...] if you think about the course, its structure, as students, it allowed us to go through various environments, access many ways of learning, in just one course! (P6G1)

The video animation consisted of a new and differentiated strategy, so that both the group of professionals and the group of undergraduates carried out a comparison between the written and the visual methods, taking their learning styles into account.

[...] sometimes we rely a lot on the written material as a script. Not there (the video), where you can see the professional at work. So, I think it was much more interesting and different, especially the digital part you can access from

distance [...] I think images make us retain more than words, written material [...]. (P50G2)

Something interesting to notice is the use of innovative strategies and resources for teaching-learning process occasioned transformations on students about preconceived concepts.

[...] through discussions in which peers present their thoughts, you can keep changing a vision that you had previously. Sometimes I have a thought, then a colleague puts it in another way, another view, which makes us to think, to reflect. All that changes our thought as well as our practice. (P5G1)

Regarding the second topic, distance education for professional education and permanent education, many participants reported they took some distance specialization or refresher course, especially those who were already graduates. However, for some participants, mainly the undergraduates, distance modality is still a new experience, which causes some apprehension at first contact.

[...] When we started the course, I thought: my God! I'm going to have to look for the tutor all the time, so she can teach me how to enter, what to do[...]. (P39G2)

This initial apprehension was overcome once they had contact with the course and resources. They realized it was not really hard to understand and use; therefore, a space was opened up for comparison between distance and in-person methods.

[...] But I came home, logged in, and when I realized, I was already using it, and when I noticed, I had already done it. So, this is how it happened, a very simple and easy way, that anyone can adapt. (P39G2)

[...] I wouldn't have this opportunity if I had attended in-person every day, sometimes I wouldn't have availability to leave work and go to the course. (P25G1)

Although distance education is a practical method, since it does not depend on time or space, the participants recognized it is essential to have responsibility, because in this teaching modality, learning depends essentially on the student commitment.

[...] students who participate in a distance education course must have a differentiated profile, because they have to be disciplined [...] you must have commitment to enter, read, it requires the student to be committed. (P4G1)

During the discussion, several strategies used during the course and possibilities offered by the VLE that facilitated teaching-learning process and knowledge construction were mentioned: reminders about activity deadlines, sent by cell phone messages, email and through the Forum "Coffee with Prose" on the platform; the course in-person moments; deadline flexibility, which were expanded, given the perception that students were having difficulties to accomplish time established for the activity; the tutor support for clarification of doubts and to encourage participation; the course design,

prepared to offer a more friendly environment and easy to explore; and the registry possibility provided by the VLE, allowing students to consult materials and activities carried out in the time and place they wish.

Regarding the third topic, the participants reported that the great facilitator for the teaching-learning process on the ICNP® was the course importance recognition, which motivated them to participate. To the professionals, the importance lied on knowing a new tool that could instrumentalize them in their practice. To the undergraduates, it lied on the opportunity to know a new tool to systematize care, in order to, in the future professional career, choose which one fits best to the clinical practice.

[...] I think because we're professionals, we are mature about the importance, so we want to participate in the course, to learn. (P21G1)

[...] to us, it's impossible not to compare the ICNP® with the NANDA, because the course came at a very good time [...] so we could see the differences, see they really are quite different work tools and both very good. I like dealing with both of them and thought it was a very good opportunity [...]. So in the future, as professionals, choose the best one to use. (P39G2)

Theoretical content and presentation form were highly rated by the participants, and did not require an information overload.

[...] you have this material, this textbook, you have this deadline to deliver it. But it's something that did not require an excessive volume of material in that period of time [...]. (P6G1)

Considering activities proposed, the students recognized there was a logical sequence of activities to conduct the teaching-learning process.

[...] So, I think the three steps are important: first, letting us free, so we can demonstrate our previous experience with the other material, which is NANDA; the ICNP® came, which kept the same written didactics; and then, a differentiated didactics was brought, which I think it can be included in the undergraduate course. (P50G2)

The knowledge acquired about the ICNP®, after finishing the course, allowed the participants to perform multiple comparisons with the North American Nursing Diagnosis Association (NANDA) classification, which they have learned during the undergraduate course. All of them reported having enjoyed working with the ICNP® the most to build nursing diagnoses, interventions and outcomes.

[...] I also think the ICNP® allows to exercise clinical reasoning, as it is more open than NANDA, in which it is already there, I think it makes the professional to think more. (P2G1)

Participants pointed out many benefits of using the ICNP®: it allows professionals to build diagnoses, interventions and outcomes from the seven axes in a practical and flexible way; for being more complete and cover more diagnostics; language

standardization; it offers possibilities to perceive individuals' completeness and better direct them to primary health care, intended not only for individuals but for their families, social factors and collectivity.

DISCUSSION

Although 94.1% of professional nurses and nursing undergraduates claimed to know nursing diagnoses, interventions and outcomes, only 25.5% knew the ICNP®. After finishing the course, 70.6% qualified their knowledge degree on the ICNP® as high, and almost all of the participants would like to use the VLE in other courses, demonstrating positive effects on the teaching-learning process of this target audience regarding VLE use. Using ICNP® for instrumentalization of clinical practice of nurses is current and little used, although it has been considered of great interest by nurses as an important mean of comparison of their activities in various clinical contexts⁽¹⁰⁾.

Participants recognized the course importance as a way to instrumentalize them for practice and they could compare the ICNP® with another classification system already known by them: NANDA, Nursing Outcomes Classification (NOC), Nursing Interventions Classification (NIC). A study carried out with nursing undergraduates, aiming to report planning action experience using the ICNP® performed for health care unit users, revealed that they had an initial resistance in using this classification system precisely because they only have contact with NANDA, NOC, NIC in the undergraduate course⁽⁶⁾. However, by using it, the ICNP® was recognized as a source of data that meets clinical need, ensures care continuity, allows clinical reasoning organization and a faster documentation of the health unit care plan^(6,10).

Regarding distance education modality, through an VLE, participants reported some initial apprehension, soon overcame after accessing the platform and realizing there was no difficulty. Number of undergraduates and nursing professionals who use resources or computer technology is increasing, a fact that has provided several benefits, such as: not depending on time and space, integrating technological resources for the teaching-learning process, in order to solve problems and develop skills in practice, being quick access to information, communication and distance education. Anyway, computing has helped a lot both in assistance and management, in addition to contribute to teaching and health education^(2,11).

However, despite the convenience provided by distance education, it requires commitment and responsibility from students, so they can administer their own learning and reach the end of the course. To assist the student in this task, in addition to the strategies used in the course, presence of the tutor was essential as a mediator of the teaching-learning process. Tutor's main goals are to motivate students, assist clarification of individual and collective questions, convey information, stimulate interaction, diagnose problems that may be complicating learning; and, most importantly, the tutor must be present, even at a distance, so students do not feel lost⁽¹²⁾.

A well-planned and friendly VLE must contain varying technological resources as educational strategy and be dynamic, enabling necessary adjustments and settings⁽¹³⁾. In addition,

use of different media in the process of construction of knowledge provides learning from multiple potentialities, capabilities and interests of students⁽¹⁴⁾. To ensure this diversity, the following resources and educational strategies were used: Animation video, Wiki, Discussion Forum, Didactic Support Textbook in virtual format and the Arch Method, all of them highly evaluated by the participants. In addition, there was a statistically significant association among Wiki, the video animation and the arch, as well as among the Forum and the support textbook and the time available, which proved the relevance of using the resources available on the Moodle Platform combined with other technologies and educational strategies.

The Moodle platform is an VLE of easy setup and allows introduction of various media and technological resources that create a modern and interactive environment, overcoming traditional methods of teaching. Wiki and Forum resources available in the Moodle Platform generate a collaborative learning, mediated by computer, which has provoked changes in learners' experience, making them more qualified to discuss, reflect and work together⁽¹⁾.

Results showed that the knowledge acquired about the ICNP® presented statistical correlation with the video animation as the most motivating strategy for clinical case presentation, the Support Textbook, the Wiki and the Arch Method, showing that the resources used added knowledge. The use of ICTs for teaching and continuing education in nursing has provided an expansion of knowledge and facilitated the teaching-learning process, which contributes to development of clinical skills and autonomy in decision-making of professional nurses and future nursing professionals⁽³⁾.

The PEH provides work value as a source of knowledge in order to solve everyday health service problems. In this study, the nurses claimed they do not perform systematization of nursing assistance in the daily care practice at FHU. In such context, the PEH on this topic favored the construction of new knowledge from previous experiences and knowledge of each professional, promoting greater critical reflection on the problems related to the assistance quality provided, in order to operate changes in practice of these professionals⁽¹⁵⁾.

The clinical reasoning process in nursing based on a problematizing methodology enables a continuous reflection problem and a critical situation in unveiling collaborative groups, from an actual situation experienced in the everyday life of the professional nurse. This collective and problematizing construction of knowledge allows students to discover and understand unknown phenomena, causing changes in thinking and acting⁽³⁾.

Study limitations

It should be noted that the lack of validated instruments for Brazil aimed at evaluation of VLE, especially for the evaluation of resources available on the Moodle Platform and other educational media technologies, made comparison of the findings with the scientific literature more difficult, which can be considered a limitation of the present study. In addition, educational media object used in the course, as the digital animation video, demanded financial investment for its development once the federal institution of higher education where

this study was conducted does not have trained professionals in animation design. Adoption of innovative educational technologies by faculty and researchers coming up often in the absence of a team of professionals to provide technical support to the production of educational technology resources, which has limited its use in higher education and continuing education of employees in health services network.

Contributions to the nursing field

The results found in this research can serve as a stimulus for qualification of nursing students and nursing professionals in the use of international classification for nursing practice, in clinical practice, particularly in primary health care, considering that the course showed up as a potential pedagogical tool for teaching the listed diagnosis, interventions and outcomes of nursing in the Virtual learning environment with scientific theories and legitimacy to nursing care.

CONCLUSION

The study made it possible to conclude that the process of learning in education "Course on Nursing Diagnoses, interventions and outcomes using the ICNP® in the Virtual learning environment" proved to be consistent. The proposal for a collective construction of knowledge about the topic allowed a significant and similar learning between the groups, and the technological resources used encouraged the participation of the students, especially the animation video, which points to the need for technological innovation in teaching, particularly in nursing.

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