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Original Article

Problem-Based Learning in Distance Education and Influences for Health Education: an Integrative Review

Aprendizaje Basado en Problemas en la Educación a Distancia y las Influencias para educación en Salud: Una Revisión Integrativa

Aprendizagem Baseada em Problemas na Educação a Distância e as Influências para educação em Saúde: Uma Revisão Integrativa

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Abstract

For being little explored in the health area, the Distance Education (EaD) makes it difficult to understand the contribution of information technologies. Besides, it is noticed the need of using methodologies that encourage active learning. The purpose of this paper was to analyze the contribution of Problem-Based Learning (PBL) through DL as a tool for health education. This paper is intended to make a an integrative review, with researches published between 2011 and 2015. Articles were analyzed, based on the following definitions: PBL and the contributions to health education; EaD in the health education process; and the impact of using PBL through DL to health education dissemination. Twelve scientific papers were included to analysis, being the majority of them with graduation/post-graduation students as target audience. It was verified that the contribution of PBL combined with DL to the

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process of health education promotes the development of proactive competences and abilities, which triggers knowledge empowerment. However, more studies about the use of PBL and DL in training sessions for health professionals who work on the field are needed.

Keywords: Problem-based learning. Distance education. Health education.

Resumen

La Educación a Distancia (EaD) en el área de la salud, puede ser poco explorada, dificulta la comprensión de la contribución de las tecnologías en información. Además, se percibe la necesidad de la utilización de metodologías que estimulen un aprendizaje activo. El objetivo del artículo fue analizar la contribución del Aprendizaje Basado en Problemas (ABP) por medio de la EaD como instrumento para la educación en salud. Este estudio consiste en una revisión integrativa, con búsquedas publicadas entre 2011 y 2015. Fueron analizados artículos con base en las siguientes definiciones: ABP y las contribuciones para la educación en salud; EaD en el proceso de educación en salud; y el impacto del uso del ABP por medio de la EaD para la diseminación de la educación en salud. Fueron incluidos para el análisis 12 artículos científicos, teniendo la mayoría como público-objetivo alumnos de graduación/posgrado. Se comprobó que la contribución del ABP combinada a EaD para el proceso de educación en salud, promueve el desarrollo de competencias y habilidades proactivas, lo que desencadena el empoderamiento del conocimiento, entretanto, son necesarios más estudios sobre la utilización del ABP y EaD en capacitaciones para profesionales de salud que actúan en el área.

Palabras clave: Aprendizaje basado en problemas. Educación a la distancia. Educación en salud.

Resumo

A Educação a Distância (EaD) na área da saúde, por ser pouco explorada, dificulta a compreensão da contribuição das tecnologias em

informação. Além disso, nota-se a necessidade da utilização de metodologias que estimulem uma aprendizagem ativa. O objetivo deste artigo foi analisar a contribuição da Aprendizagem Baseada em Problemas (ABP) por meio da EaD como instrumento para a educação em saúde. Este estudo consiste numa revisão integrativa, com pesquisas publicadas entre 2011 e 2015. Foram analisados artigos com base nas seguintes definições: ABP e as contribuições para a educação em saúde; EaD no processo de educação em saúde; Impacto do uso da ABP por meio da EaD para a disseminação da educação em saúde. Foram incluídos para a análise 12 artigos científicos, tendo a maioria, como público-alvo, alunos de graduação/pós-graduação. Verificou-se que a contribuição da ABP combinada a EaD para o processo de educação em saúde promove o desenvolvimento de competências e habilidades proativas, o que desencadeia o empoderamento do conhecimento; porém, são necessários mais estudos sobre a utilização de ABP e EaD em capacitações para profissionais de saúde que atuam na área.

Palavras-Chave: Aprendizagem baseada em problemas. Educação a distância. Educação em saúde.

Introduction

Debates about health education and the importance of training professionals who are able to recognize the need for comprehensive care offered to the population have been more frequent both within educational institutions and in the health governmental sphere (MELLO, ALVES; LEMOS, 2014).

This fact has occurred due to the transformations in the world of work, by the increasing demands for a better health care, health surveillance and criticism of the traditional model of education (GUIMARÃES; MARTIN; RABELO, 2010). Therefore, more and more health professionals are required to take a critical-reflexive stance, in order to promote professional development and integral care (SILVA et al, 2015).

Thus, one of the challenges of educational institutions is to prepare these professionals with the knowledge, skills and attitudes to act in a qualified way and provide resolvability to health issues (MEZZARI,

2011). However, this responsibility is not only for educational institutions, but for all health professionals, who should seek their qualification through continuing education (SILVA et al, 2015).

One of the alternatives to stimulate this process of teaching and developing critical thinking is the use of active learning methodologies (MELLO; ALVES; LEMOS, 2014). Problem-Based Learning (PBL) is an active methodology, characterized by the application of a certain problem situation, which uses pre-acquired knowledge and, at the same time, adds new information to the existing ones, in order to obtain a greater resolubility of the case (MELLO; ALVES; LEMOS, 2014).

This teaching model is constituted through a renewed pedagogy (DIEHL et al, 2012), capable of promoting the construction of knowledge by the subject itself, and also, to determine that it acquires critical and analytical skills, with a greater propensity to develop professional attitudes desirable for use in their daily practice (MELLO; ALVES; LEMOS, 2014). Thus, in the PBL, the health professional is invited to work with real problems, assuming increasing responsibilities and interacting with the population and with health professionals from different areas (LIMBERGER, 2013).

The PBL methodology can be applied both in the traditional way of teaching and in Distance Education (MEA) (MEZZARI, 2011), but, because the institutions that work with the traditional teaching modality are not able to meet the growing training needs of these professionals (GUIMARÃES, MARTIN, RABELO, 2010), EAD has been seen as an option for continuing education in the health area (MEZZARI, 2011).

EAD can reach a large public and has shown to be effective for adult education in the labor market. However, in the health area, it is still little explored, being a more used modality in undergraduate/graduate studies programs (SILVA et al, 2015), which makes it difficult to understand the contribution of Information and Communication Technologies (ICT) in the health education process (SILVA et al, 2015).

Thus, the main objective of this study is to analyze the contribution of PBL through EAD as an instrument for health education. Health

education aims to improve the health situation and quality of life through educational actions, attitudes and behaviors for health; therefore, constitutes a space for the dissemination of new knowledge and practices for the realization of health education for health professionals.

This integrative review proposes to answer the following questions: How does the use of PBL contribute to health education? How does the use of EAD in the health education process occur? What is the impact of the use of PBL through EAD for the dissemination of health education?

Methodology

This study consists of an integrative review that aims to gather and synthesize the scientific knowledge found in the databases researched on the subject investigated to better understand the theme (MENDES; SILVEIRA; GALVÃO, 2008).

The search for articles was conducted in November 2015, selecting scientific papers published in the period from 2011 to 2015 in the following databases: CAPES' Papers(Coordination of Improvement of Higher Level Personnel), Virtual Health Library (BVS-Bireme), SCOPUS and US National Library of Medicine National Institutes of Health (PUBMED). In order to begin the survey on these bases, the Health Descriptors (DeCS) were studied, in order to find works that answered the problem investigated.

According to Mendes, Silveira and Galvão (2008), for the construction of an integrative review, it is necessary to go through six stages:

First stage: the objectives of the study were defined, the keywords, and the research question was raised: Does the PBL contribute to the health education process?

Second stage: the search was started through the descriptors in Health Sciences of the Virtual Health Library (DeCS-VHL), in the selected databases. The following descriptors were used: "Health education", "distance education" and "problem-based learning". The search equation used is: ("health education" OR "distance education") AND "problem-based learning". It should be noted that the Boolean operator "AND" and "OR" were applied between the descriptors.

Also in this stage, the following inclusion criteria were established: scientific productions in Portuguese, English or Spanish, with the full text, with the original articles being available in full and addressing the use of PBL in EAD and in health education within the period of the year 2011 to 2015. And as exclusion criteria, duplicate and paid studies, and that did not meet the study questions. After this search, 256 articles were found.

Third stage: consisted of the selection of articles; after reading the titles and abstracts, following the inclusion and exclusion criteria, 29 articles were selected. Subsequently, a synoptic table was constructed, consisting of the following variables: authors, year of publication, database, qualis, title of study, approach, type of research, objective and results achieved and, after that analysis, were selected 17 articles.

Fourth stage: moment of the critical analysis of the studies included in the integrative review; the selected articles were analyzed by reading the texts in full, seeking to delimit the categories of analysis, in order to respond to the research objectives. The final sample totaled 12 articles.

Fifth stage: phase in which the interpretation and discussion of the results occurred. From this analysis, three categories emerged: PBL and Health Education; EAD in the process of Health Education; PBL and EAD in the dissemination of Health Education.

Sixth stage: a time when a review and synthesis was built on the use of PBL in EAD for the Health Education process. The ethical aspects were respected, and the copyrights of the articles were analyzed.

Results

In the databases used, we found 256 articles available; from which 29 articles were selected by title and abstract, and after that analysis, 17 articles were selected for reading in their entirety. The final sample was constructed by 12 articles, presenting the following form in relation to the year of publication: Four (4) articles from 2012, 3 articles from 2011, 3 articles from 2014 and two publications from the year 2013. As to the origin of the articles, only two are national, and the rest, international. These articles are presented in more detail in Table 1.

Table 1: Data of selected articles for the integrative review

Database	Title / Author	Periodical	Study outline	Objectives
1 Bireme	Uso da Aprendizagem Baseada em Problemas como Reforço ao Ensino Presencial Utilizando o Ambiente de Aprendizagem Moodle Use of Problem-Based Learning as Reinforcement to Face-to-Face Teaching Using the Moodle Learning Environment Mezzari, 2011.	Revista Brasileira de Educação Médica 35 (1): 114-121; Qualis: A2	Descriptive of exploratory approach Location: Brazil Sample: 44 medical students.	Implement changes in the discipline of Parasitology and Medical Mycology of the UFCSPA Medicine course.
2 Bireme	Educação a Distância em Nefrologia na Amazônia: Processos e Resultados Distance Education in Nephrology in the Amazon: Processes and Results Diehl et al, 2012.	Revista Brasileira de Educação Médica 36 (4): 550-556; Qualis: A2	Experience report Location: Brazil Sample: 175 medical students.	To report the experience related to the accomplishment of a semipresencial course for medical students.
3 Bireme P. Capes PubMed Scopus	Content analysis of medical students' seminars: a unique method of analyzing clinical thinking Takata et a, 2013.	BMC Medical Education 13: 156, 201. Qualis: B2	Descriptive research Location: Asia Sample: 12 medical students.	Report the application of technology in health education, and content analysis in a Web-based seminar.
4 PubMed	A Faculty Development Course to Enhance Dental Hygiene Distance Education: A Pilot Study Johnstone-Dodge et al, 2014.	Journal of Dental Education V. 78, No. 9; Qualis: A2	Descriptive research Location: USA Sample: 7 teachers of dentistry.	Describe the implementation and evaluation of a faculty development course for dental hygiene educators in the EAD modality.

5 Bireme P. Capes PubMed	Blended learning in health education: three case studies Jong et al, 2014.	Perspect Med Educo (2014) 3:278–288	Qualitative exploratory research Location: UK	Analyze whether mixed learning can be effective.
6 P. Capes	Incorporating global health competencies into the public health curriculum Winskell et al, 2014.	Public Health Reports Volume 129 Qualis: B1	Descriptive research Location: USA Sample: 261 masters students in Health.	Introducing a course to health students, in order to equip them with critical perspectives and skills on public health through PBL and EAD resources.
7 Bireme PubMed	Academic Performance in a Pharmacotherapeutics Course Sequence Taught Synchronously on Two Campuses Using Distance Education Technology Steinberg; Morin, 2011.	American Journal of Pharmaceutical Education 75(8) Article150 Qualis: B2	Descriptive research. Location: USA Sample: 180 Pharmacotherapy students.	To compare the students' development of a pharmacotherapy course in an on-campus campus and an EAD campus through teleconference.
8 Bireme PubMed	Pharmacy Student Engagement, and Perception in a Flipped Satellite Classroom Mclaughlin et al, 2013.	American Journal of Pharmaceutical Education 77(9) Article 196 Qualis: B2	Exploratory research Location: USA Sample: 22 pharmacy students.	Determine whether the use of mixed learning methods conducted at two campuses improves academic performance.

9 Scopus	Online problem-based and enquiry-based learning in the training of educational psychologists Bozic; Williams, 2011.	Educational Psychology in Practice Vol. 27, No. 4 Qualis: B2	Descriptive research Location: UK Sample: psychology students.	Describe how the PBL through online discussion is used within the professional training for psychologists in a university.
10 P. Capes	Case-based e-learning to improve the attitude of medical students towards occupational health, a randomized controlled trial Smits et al, 2012.	Occup Environ Med 69:280-283 Qualis: A1	Exploratory research Location: Netherlands Sample: 141 medical students.	Ensure that online case-based learning is more effective than text-based learning, related to occupational health.
11 P. Capes Scopus	Mobile Technology Use in Medical Education Luanrattana, 2012.	J Med Syst 36: 113-122	Exploratory research Location: Australia Sample: 15 medical students.	Determine the functionalities of wireless connectivity for the PBL in the medical curriculum at the Graduate School of Medicine.
12 Bireme P. Capes Scopus	A comparison of classroom and online asynchronous problem-based learning for students undertaking statistics training as part of a Public Health Master degree JONG et al, 2013.	Adv in Health Sci Educ 18:245-264	Exploratory case study Location: Netherlands Sample: 23 medical students.	Compare traditional classroom teaching with asynchronous online teaching and learning methods in two groups of students who used PBL in a master's degree.

Source: Own elaboration / Integrative review research

It was observed, then, that 8 articles deal with courses of curricular components for graduation, being 5 for medical courses, 1 for the pharmacy course and 1 for the psychology course. At the postgraduate level were found 2 courses also as discipline members of the curriculum. Another article dealt with a course developed in 3 different environments, whose target audience was mixed, with undergraduate and graduate students.

Only one article of the selected ones dealt with a qualification for health professionals trained and active in the area, which caught our attention, confirming the lack of studies related to this theme involving this public.

In all articles that used virtual environments (EAD), the available learning objects were texts, videos, animations, interactive activities, and most counted on the mediation of tutors. There were also courses that used "telessalas" rooms with satellite transmission, while in others, all class material was posted online, and the student progressed according to their pace and stipulated time frame. The identification of issues related to PBL and Health Education, EAD and Health Education and also the impact of both PBL and EAD in the dissemination of Health Education can be observed in Table 2.

Table 2: Description of article analysis based on research questions

	PBL X Health Education	EAD X Health Education	Impact of PBL and EAD in Health Education
I	The active participation of the student in his/her learning has been more productive than just the information of the teacher in the classroom. In the PBL, the objective is to generate doubts, imbalances or intellectual disturbances.	Semipresencial, use of Moodle (link, chat, forum) for the application of a discipline. The EAD allows the organization of schedules, and is an effective method for professional training.	Less distance between theory and practice, and content becomes more interesting. It allows to build adequate and useful pedagogical tools, aiming at quality, innovation and updating.

2	In PBL, students are faced with a problem, which is succeeded by inquiry into a learning process. Learning is characterized by being active, with stimulus in the search of knowledge.	Semipresencial courses, uses the Moodle (web conference, forum, video lectures); in the EAD it is necessary that there is bilateral interaction and communication, mediated by appropriate technologies for student training.	The construction of the semipresencial course with resources of EAD and PBL was a timely solution for teaching, since it minimized difficulties in relation to the lack of teaching professionals, and showed good acceptance of the student body.
3	The PBL was used to start the discussions. Only 15% of the students showed more critical responses.	Exclusively EAD, with use of captured video and audio for the content analysis.	Although the results are preliminary, the content analysis may improve the inclusion of PBL.
4	PBL establishes greater interaction in the learning process, proving to be more effective; and enables independence and control over learning. Collaboration, communication and student involvement are constructs related to critical learning.	Exclusively EAD, through Moodle, using video lectures; forum and chats. The use of innovative and interactive strategies facilitates communication and collaboration among students and can contribute to the lifelong learning of future health professionals.	Online education is designed to improve student satisfaction. The tutor directs learning through aspects of teaching and cognitive presence; provides clear course instructions, technical support, and promotes collaborative and challenging learning activities.
5	In PBL, learning must be constructive, contextual, collaborative and self-directed. The study analyzes the effectiveness of active and collaborative learning (PBL) in 3 case studies.	With semipresencial course, the combination of activities will depend on the learning objects, content, target audience and the tools available. The role of the teacher in online sessions requires attention.	The Active and collaborative learning is possible from a distance, and activities can be efficient and effective. The selection of tools, planning and preparation should be done carefully.

6	PBL has the advantage of enabling students to understand, at the thought level, complex global health challenges and respect for contextual specificity, which is essential for effective and sustainable solutions. PBL is one of the pillars of clinical education.	Exclusively EAD. Use of questionnaires, asynchronous online discussion forum, online videos (a highly interactive course). This methodology is used to stimulate understanding, and to promote interactivity and critical thinking of students.	Engage students in a collaborative way as active learners and allowing them to build their training and skills, through previous experiences. PBL is appropriate to introduce complexity and health challenges globally.
7	The course used case-based learning, i.e., the student-centered approach to active learning.	Semipresencial course on a campus and exclusively EAD by synchronous teleconference on another campus.	The learning is not different between the students who received a class in the traditional model and those who received in a synchronous way.
8	Active learning can improve student experiences by facilitating interaction and reducing psychological distancing between the tutor and the student.	Semipresencial course; synchronous video teleconferencing, via satellite. The engagement in EAD environment is related to student performance, satisfaction, participation, motivation, and critical thinking.	The performance of classes transmitted via the web was not significantly higher than in the traditional classroom. They reveal a picture of engagement, development and empowerment in the EAD environment.
9	Use of the PBL in which psychology students were encouraged to work collaboratively to analyze and discuss a particular problem, bringing the research and theories of subjects that address a lively and stimulating questioning.	EAD through the Virtual Learning Environment (WebTC). The flexibility of online methods allows you to work at convenient times, although you have to be patient with answers and posts, which may not be as fast as you want.	EAD and PBL allow for online case discussions where students can be introduced to contemporary problems or practical issues, and thus can work collaboratively over significant times, even though they are separated at a distance.
10	It uses PBL as an attractive clinical setting to improve students' attitude toward occupational health.	Semipresencial course.	There was no statistical significance regarding the knowledge between the groups.

11	Incorporation of mobile technology into the PBL in medical curricula.	Exclusively EAD, with the use of mobile technology with wireless connectivity. Communication between peers, clinical preceptors and faculty facilitates diagnosis and treatment.	Allows students immediate access to clinical resources and information; enables you to record and update your clinical experiences and encounters. It also allows the student to manage and organize their daily activities.
12	PBL involves collaboration and participation of all in the process of active learning in response to established problems. Improves understanding of how the student learn; shows the importance of student-centered learning. PBL should be constructive, self-directed, collaborative and contextual.	Exclusively EAD with video lecture use and discussion forum. In the online discussions, the absence of the formal tutor in the group may have made the students trust each other, developing their own critical thinking skills, analysis, and self-regulation.	The students in the online methodology were more committed to their learning and showed greater maturity than the students who attended the classroom. Online students were able to manage time without the need for additional time, and this did not affect the quality of learning.

Source: Own elaboration / Integrative review research

Discussion

New teaching methods can be applied to make education more authentic and student-centered. The traditional modality of teaching is generally more teacher-centered, which only transmits knowledge to the student, which may compromise the development of critical thinking, since the student only assimilates what is presented to them without much questioning (MEZZARI, 2011).

The teacher should not be seen as a conductor, but rather as a companion or as a facilitator in the quest for the construction of knowledge; the student should be encouraged, through appropriate orientations, to evaluate what is presented to them and, thus, to construct their thought in a critical and analytical way (LIMBERGER, 2013). Therefore, learning must be constructive, contextual, collaborative and self-directed, and these principles can be applied in the form of PBL (JONG et al, 2014).

Jong et al (2013) discusses the importance of combining PBL methodology with EAD strategies, as it promotes the development of important skills and techniques, such as research, knowledge search and proactive skills. This synergy allows communication between students, teachers and tutors, wherever they are, which facilitates learning and promotes not only the acquisition of knowledge but also an understanding of different social and cultural perspectives within diverse learning environments.

The two approaches (EAD and PBL) can facilitate multidisciplinary learning, maintain a better perception of teamwork and potentiate the resolution of daily work problems. This makes the use of online PBL allows health professionals who wish to improve their knowledge a greater flexibility of time to be able to adapt their routine, since often the face-to-face form makes it unfeasible (JONG et al, 2013).

However, the effectiveness of this teaching methodology (EAD) in relation to the traditional method (classroom) is still questioned, especially when it refers to the permanent education of these professionals (STEINBERG; MORIN, 2011). One of the reasons may be the lack of research about the subject; as we have seen in the analysis of the articles, only one study showed the importance of the use of PBL with the use of EaD to enable and improve the knowledge of health professionals already active in the area.

Currently, the health professional is required not only to reproduce information received, but also to produce their own knowledge through the evaluation of available information, as well as their professional experiences, expanding their field of learning (LIMBERGER, 2013).

Use of PBL and contributions to Health Education

PBL is particularly suited for the development of critical thinking, problem solving, collaborative skills and shared knowledge (WINSKELL et al, 2014). The Steinberg and Morin study (2011) points out that although the teaching methodology based on lectures is a long tradition

in higher education, the need for more dynamic methods that allow the student to play a more active role in the learning process is fundamental.

These concepts support the paradigm that people learn more effectively when they experience social interaction and have independence and control over their learning (MEZZARI, 2011; JOHNSTONE-DODGE et al, 2014). Furthermore, because it facilitates student interaction for case discussion, PBL also develops and stimulates teamwork (MCLAUGHLIN et al, 2013; BOZIC; WILLIAMS, 2011) and allows a more global understanding of complex cases that appear in the health area, and considering the specificities of each case, this tends to lead to effective solutions (WINSKELL et al, 2014).

Collaboration, communication and involvement are constructs related to the critical learning environment, where students learn through the understanding of shared experiences (JOHNSTONE-DODGE et al, 2014). However, this is not always the case, Takata et al (2013) reports that only 15% of the students' comments represented critical thinking, i.e., the majority of the students (85%) did not demonstrate a degree of critical thinking in their comments, which shows us the need to develop this ability during training, stimulating the construction of critical thinking, autonomy and motivation in the search for learning.

Use of EAD in the process of Health Education

With today's technology, educational opportunities are being provided to people and places previously inaccessible due to time, distance, and funding. Internet-based educational programs at colleges and universities around the world have gained acceptance and popularity (JOHNSTONE-DODGE et al, 2014).

Steinberg and Morin (2011) showed in their study that the students have the same performance in face-to-face mode when compared to the EaD methodology, indicating that there is no loss in the use of EAD in the learning process. In addition, this modality of teaching enables the development of skills, such as critical thinking, analysis and self-regulation (JONG et al, 2013).

The use of EaD facilitates communication and collaboration among students, teachers and tutors in the learning process (JOHNSTONE-DODGE et al, 2014) and is an effective method for professional training (MEZZARI, 2011). However, in order for this teaching process to take place properly, activities should be planned, taking into account the content addressed, the target audience and also the tools available (JONG et al, 2014).

In order to enable better pedagogical teaching practices, teachers/tutors should monitor interactions and assignments, provide immediate feedback, clearly outline course expectations, address diverse learning styles, and integrate collaborative and technology tools (JOHNSTONE-DODGE et al, 2014). It is very important that, when designing an EAD course, the possible limitations and barriers that may arise, in order to avoid high dropout rates and dissatisfaction with the distance learning experience (JOHNSTONE-DODGE et al, 2014).

A limiting factor pointed out by Johnstone-Dodge et al (2014) was the fact that half the tutors of a course did not receive training before starting online teaching. It is known that the training of tutors for EaD courses is fundamental, as they are responsible for providing technical support, maintaining the learning community involved and stimulating discussions to promote teaching.

Self-assessments conducted with tutors themselves have indicated the importance of providing timely feedback to students in their online courses, and that student satisfaction is highly related to timely tutor responses (JOHNSTONE-DODGE et al, 2014). In other words, in order to keep the students stimulated in the learning process, it is fundamental that there is frequent communication with the tutor, in which they present explanations in a clear and objective way, so that the student can solve their doubts.

Impact of the use of PBL through EAD for the dissemination of health education

Decisions about the structure and focus of EAD courses should be based on the type of learning desired, the time it needs to be developed,

where it occurs and the cost to be spent, and such perspectives are always student-centered (JONG et al, 2013).

In addition to helping to overcome possible scheduling problems, EaD makes it possible to optimize time and avoid displacement and thus to manage the sequence or rhythm of material available from its learning (JONG et al, 2013). The study performed by Jong et al (2013) found that some participants in the training course referred to the workload as a barrier to its implementation; in addition, it was reported that the course schedule was one of the reasons some students did not enroll.

Thus, innovative educational formats are accessible and manageable from all over the world, however, there is a need for careful selection of tools and planning, preparation and technical support. PBL is a methodology that facilitates the necessary involvement of the students in a virtual environment, because it works with real cases and allows the student to apply the studied knowledge in practice, as it stimulates the students' involvement in a collaborative way, as active learners during the formation through previous experiences (WINSKELL et al, 2014).

In the study performed by Jong et al. (2014), who used PBL and compared two groups of students, one with online classes, and another in the traditional classroom form, clearly verified that student learning as an active collaborator is also possible, and that online learning activities can be efficient and attractive, there is no loss of learning quality with the use of EaD compared to the traditional classroom method, and that these are equally effective and efficient for students in the learning process.

Therefore, there is no standard solution, an ideal combination of learning activities - it depends on the objectives and content of learning, the target audience and the facilities available, always aiming at quality, motivation and updating (MEZZARI, 2011).

Final Considerations

The PBL, when combined with EaD, promotes the development of proactive skills and abilities, which triggers in the student an empowering

knowledge. These two approaches can facilitate greater multidisciplinary learning and maintain a better perception of teamwork.

EAD allows the qualification of a greater number of personnel, as well as new opportunities for permanent training, greater flexibility regarding timetables and also space. From the studies analyzed, it can be observed that the performance of students using EaD is not inferior, and there is no significant difference, when compared to the traditional teaching model. Thus, in addition to giving students flexibility to learn, EaD enables them to conduct their process of building knowledge, stimulating the search for learning.

The performance of this study also made it possible to verify the contribution of PBL and EAD in the health education process, but the data showed that there are few studies published, mainly, in what refers to training courses for health professionals working in the health care area; most courses are focused on undergraduate/graduate students as part of the curriculum. Thus, it is necessary to have more reflections about PBL and EAD that include professionals working in the health area.

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