

## ORIGINAL ARTICLE

## ANALYSIS OF THE READINESS ASSURANCE STEP OF THE TEAM BASED LEARNING IN NURSING TEACHING

Jouhanna do Carmo Menegaz<sup>1</sup>   
Alana Celeste Campos Dias<sup>1</sup>   
Ana Victória Antônio José dos Santos<sup>1</sup>   
Camila Stefany Silva de Souza<sup>1</sup>   
Maria Clara Costa Figueiredo<sup>1</sup>   
Glenda Roberta Oliveira Naiff Ferreira<sup>1</sup> 

### ABSTRACT

**Objective:** to analyze the readiness assurance step of the Team-Based Learning through the performance of Nursing students in the Individual Readiness Assurance Test – iRAT and Team Readiness Assurance Test – tRAT.

**Method:** descriptive study of quantitative nature. Twenty-six fifth semester students of a university of northern Brazil participated. Data collection took place in October and November 2018 with questionnaires applied in five units. The analysis was descriptive, by questionnaire, question, team and student.

**Results:** the team performance was superior, but not in all units. There are issues where students individually and in teams presented difficulties, suggesting intervening variables of pedagogical origin.

**Conclusion:** the analysis by performance of students suggests failures in the readiness assurance. The study contributes by indicating possible pedagogical variables that can influence the success of this step of the Team-Based Learning.

**DESCRIPTORS:** Education, Higher; Education, Nursing; Teaching Materials; Students, Nursing; Learning.

### ANÁLISIS DE LA ETAPA DE GARANTÍA DE PREPARACIÓN DEL TEAM BASED LEARNING EN LA ENSEÑANZA DE ENFERMERÍA

#### RESUMEN:

**Objetivo:** analizar la etapa de garantía de preparación del Team-Based Learning a través del desempeño de los estudiantes de Enfermería en el Individual Readiness Assurance Test – iRAT y Team Readiness Assurance Test – tRAT. **Método:** estudio descriptivo con enfoque cuantitativo. Veintiséis estudiantes en el quinto semestre de una universidad del Norte de Brasil. La recopilación de datos se realizó en octubre y noviembre de 2018 con cuestionarios aplicados en cinco unidades. El análisis fue descriptivo, por cuestionario, pregunta, equipo y alumno. **Resultados:** el desempeño en equipo fue superior, pero no en todas las unidades. Hay cuestiones en las que los estudiantes, individualmente y en equipo, presentaron dificultades, sugiriendo variables que intervienen de origen pedagógico. **Conclusión:** el análisis por el desempeño de los estudiantes sugiere fallos en la garantía de preparación. El estudio contribuye indicando las posibles variables pedagógicas que pueden influir en el éxito de esta etapa del Team-Based Learning.

**DESCRIPTORES:** Educación Superior; Educación en Enfermería; Materiales de Enseñanza; Estudiantes de Enfermería; Aprendizaje.

## INTRODUCTION

The exercise of nursing requires the development of assistance skills<sup>(1)</sup> such as clinical reasoning and complex care; managerial, such as care planning and leadership; and attitudinal, such as communication and teamwork. Competencies are commonly associated to individual resources or attributes, classified in the elements' knowledge, ability and attitude<sup>(2)</sup>.

An important part of the development of competencies begins at graduation, through curricular and extracurricular experiences that provide knowledge, abilities and attitudes aiming at making the students competent in the exercise of nursing at different levels of attention. However, for the development to occur, it is necessary to elect pedagogical models and strategies that promote active learning<sup>(3)</sup>.

Although we have observed in the last few years an important movement of reorientation of professional training in health, particularly expressed in curriculum reviews and pedagogical practices, incorporating active methodologies, there is still a strong presence of traditional teaching approaches, such as classes in lecture format with passive transmission of information<sup>(4)</sup>.

The traditional teaching model, focusing on instruction and the professor, shows disarticulate of the demands required for the practice of Nursing<sup>(4)</sup>. In a challenging scenario of fast technological changes, new organizational logic of health systems with intense articulation and integration, the search for expanding access and quality of care becomes necessary, since this scenario demands health professionals with capacity to act together, mobilize and apply knowledge to solve common situations to the professional practice, as well as learn and constantly adapt to the demands and needs of their performance<sup>(1)</sup>.

That said, the importance of using and investigating alternative pedagogical models, student-centered, active learning, that promote not only transmission but also development of knowledge, such as the Flipped Classroom (FC) or inverted classroom, which is a pedagogical model of inversion of the traditional teaching model: from (1) Teaching, (2) Individual study and (3) Evaluation process to (2) Individual study, (3) Evaluation and (1) Teaching<sup>(3)</sup>.

There are several ways to apply this model. One of them is the Team Based Learning (TBL) method, whose typical unit is divided into preparation steps (Pre-class preparation), readiness assurance and application of course concepts (Application of Concepts). It is recommended that the content be organized in units and that, in each one, the preparation-pre-class guarantee is 45-75 minutes and the application of concepts is one to four hours<sup>(5)</sup>.

The readiness assurance can be compared to the control mechanism, because it provides the professor with the possibility of evaluating the first element of competence: knowledge. It is planned to promote recognition and understanding of the concepts that will be applied in the future. It has four subsequent steps: (1) Individual Readiness Assurance Test (iRAT); (2) Team Readiness Assurance Test (tRAT); (3) Written appeals; (4) Clarifying lecture<sup>(5)</sup>.

The study of new learning methodologies has grown in recent years with the purpose of presenting new ways of teaching, so that the student is the protagonist of his own learning and the professor, a facilitator. The TBL has the potential to contribute to this by requiring prior study and encouraging the sharing of knowledge in groups and the application of this knowledge in problem situations.

When introducing new teaching methods, it is relevant to monitor the performance of students who, besides suggesting whether the changes are successful, can be a thermometer of our pedagogical capacity. Considering the context above, this manuscript

aims to analyze the Team-Based Learning readiness assurance step through the performance of Nursing students in iRATs and tRATs.

## METHOD

Descriptive study of quantitative approach. Twenty-six students participated, organized in four teams, two composed of seven members and two of six. Once formed, the teams remained fixed until the end of the section. Being regularly enrolled in the discipline was a criterion for inclusion. As exclusion criteria: students who did not participate in the team building activity, first step of TBL<sup>(6)</sup>.

The study took place in the subject of Nursing Administration (fictitious name) in the Nursing College of a public university in the North Region of Brazil, whose menu proposes the study of the historical and theoretical context of the administrative process, with emphasis on social development, the organization of health policies and their application in the nursing field.

Allocated in the fifth semester, the course had a workload of 170 hours, being 85 theoretical, five hours a week. The choice was for convenience, considering the access of the researchers and the fact that Flipped Classroom methods were inserted two years ago in the classes.

The program content was divided into four sections and the TBL was inserted in the fourth section, administrative process, for which 25 curricular hours were allocated in ten meetings. The application of the TBL was structured according to the proposal of Michaelsen and Sweet in five units: administrative process and alignment, planning, organization, direction and control<sup>(5)</sup>.

For the individual study step of each unit, five chapters of Idalberto Chiavenato's book "Administration: theory, process and practice"<sup>(7)</sup> were read. The materials for reading were made available in advance, via Google Drive. Between classes, students had a minimum interval of three to four days to read in advance. This step was remote.

For the individual (iRAT) and team (tRAT) tests, five multiple-choice questionnaires were constructed, based on the literature indicated. Thirty minutes were allocated for iRATs and thirty for tRATs. The teams discussed the questions addressed in the questionnaire in order to reach consensus and thus define the final template to be delivered. These were then handed to the monitors.

Then, professor informed the template and anticipated the time of appeal if it occurred. She provided feedback on the correct answers and expected possible contestations. Then, the exhibition would begin. The analysis of each question was exposed, taking up concepts previously seen in the didactic material, solving students' doubts, and providing discussion about the theme.

The data collection took place in October and November 2018. The data collected were from the iRAT and tRAT surveys of the five units. This step was in person. In all, 106 questionnaires were collected, with 24 questionnaires missing from the full sample, seven for planning, five for organization, six for direction and control. There were classes where students were missing, changing the number of participants in each unit.

The administrative process and planning questionnaire had nine questions; the organization and direction questionnaire, six questions; and the control questionnaire, seven questions. Considering the number of questions and respondents to each questionnaire, 234 administrative process questions were answered in the iRATs, 171 planning questions,

126 organization questions, 120 management questions, and 140 control questions. In the tRATs, 36 questions were answered for administrative process, 36 for planning, 20 for organization and 24 for direction and control.

After the data was organized in Microsoft Excel spreadsheet, the averages of individual and team hits were calculated, based on the number of questionnaires answered.

This study is part of the research macro-project "Management in Nursing: new approaches of training and work in public universities and teaching hospitals", approved by the Research Ethics Committee under Opinion No. 2,165,945.

## RESULTS

Data are presented focusing on student performance in iRATs and tRATs, steps 1 and 2 of the readiness assurance step. It was observed that the percentage of hits was higher in tRATs, with the exception of the organization unit questionnaire, which had higher percentage of hits in iRATs.

In Table 1, the class data, with frequency and average hits in iRATs and tRATs per questionnaire are presented.

Table 1 - Percentage and mean of iRAT and tRAT hits. Belém, PA, Brazil, 2018

Questionnaire	(n) % of iRAT hits	iRAT average hits	(n) % of tRAT hits	tRAT Average hits
Process	161 Planning	6,16	28 77,77%	7
Organization	115 Management	6,05	7 75%	6,75
Control	13 10,31%	0,6	2 8,30%	0,5
Direção	117 83,57%	5,85	26 92,80%	6,5
Controle	96 80%	4,8	20 83,33%	5

Source: Authors (2018)

The frequency of hits in iRATs, by question, by questionnaire, is in Table 2. When the questionnaires per unit are analyzed, considering the number of hits, it is possible to indicate in which students had difficulties. The questions with less than 70% hits were considered, as recommended coverage of content in the Peer Instruction<sup>(8)</sup> method. In the alignment, questions 2, 3, 4 and 7; in the planning, questions 6 and 7. Organization, all questions. Management, question 5 and control, questions 1 and 6.

Tabela 2 – Frequência de acertos em iRATs por question e questionário. Belém, PA, Brasil, 2018

Questions	Alignment	Planning	Organization	Management	Control
	Number of hits				
1 <sup>st</sup> question	23	18	8	16	18
	88,46%	94%	38%	80%	90%
2 <sup>nd</sup> question	18	19	0	17	17
	69,20%	100%	0	85%	85%
3 <sup>rd</sup> question	14	13	0	20	15
	53,84%	84%	0	100%	75%
4 <sup>th</sup> question	2	14	1	19	18
	7,69%	73%	4%	95%	90
5 <sup>th</sup> question	25	19	3	9	(n=18)
	96%	100%	14%	45%	90%
6 <sup>th</sup> question	23	8	1	19	5
	88,46%	42%	4%	95	25%
7 <sup>th</sup> question	7	10		20	
	26,92%	52,60%		100%	
8 <sup>th</sup> question	23	19			
	88,46%	100%			
9 <sup>th</sup> question	26	10			
	100%	52%			

Fonte: Autores (2018)

The analysis by team, with the team's successes by member, by questionnaire, is presented in Table 3. Analyzing the hits per member, two situations are observed: that the number of hits of the majority is repeated by the team or there is an apparent conciliation between the answers of a member that got more right, alone, with the others. An exception is applied to the organization questionnaire, in which both members and teams had poor performance.

Table 3 - Number of team hits per member and questionnaire. Belém, PA, Brazil, 2018 (continues)

	Process	Planning	Organization	Managemet	Control
Hits per student	n hits	n hits	n hits	n hits	n hits
Team 1	7	4	1	6	4
Student 1	7	-	1	-	-
Student 2	7	-	1	-	-
Student 3	5	-	1	-	-

Student 4	6	4	-	6	5
Student 5	7	-	1	6	4
Student 6	8	4	0	4	5
Student 7	7	-	-	-	-
Team 2	6	8	0	7	6
Student 8	5	8	-	3	5
Student 9	8	7	1	6	4
Student 10	7	6	0	-	-
Student 11	5	5	1	6	3
Student 12	4	7	-	7	6
Student 13	5	7	1	7	6
Student 14	3	4	1	4	5
Team 3	7	7	1	6	5
Student 15	6	6	1	6	4
Student 16	6	7	1	6	4
Student 17	7	7	0	6	5
Student 18	6	-	2	-	-
Student 19	8	3	0	5	5
Student 20	6	6	0	6	5
Team 4	8	8	0	7	5
Student 21	7	6	0	7	6
Student 22	5	7	1	6	5
Student 23	8	7	0	7	5
Student 24	6	7	0	6	4
Student 25	7	7	0	7	5
Student 26	5	-	-	6	5

Source: Authors (2018)

Table 4 shows the percentage of hits per team in each questionnaire, as well as the attendance of students. The percentage of hits decreased both as a function of the number of members present and in relation to the content.

Table 4 - Percentage of hits per team in each questionnaire and attendance of students. Belém, PA, Brazil, 2018

Team	Process		Planning		Organization		Management		Control	
	A* (n) %	P** (n) %	A (n) %	P (n) %	A (n) %	P (n) %	A (n) %	P (n) %	A (n) %	P (n) %
1	7	7	4	2	1	5	6	3	4	3
	77%	100%	44%	29%	16%	71%	85%	43%	66%	42,80%
2	6	7	8	7	0	5	7	6	6	6
	66%	100%	88%	100%	0%	71%	100%	86%	100%	85,70%
3	7	6	7	5	1	6	6	5	5	5
	77%	86%	77%	83%	16%	100%	85%	83%	83%	83%
4	8	6	8	5	0	5	7	6	5	6
	88%	86%	88%	83%	0%	83%	100%	100%	83%	100%

A\*= Hit P\*\*= Present

Fonte: Autores (2018)

## DISCUSSION

For the Readiness Assurance step to occur in a way that favors performance and learning, it is necessary to identify and analyze variables that can influence its execution, some concern pedagogical preparation and others, the students. This article focuses on the discussion of pedagogical aspects, although it mentions issues related to students, because it is understood that for the analysis of their performance, it is also necessary to analyze the performance of the teaching team in the implementation of the method.

In each curricular component, the pedagogical work is directed to the promotion of students' performance and learning, based on the objectives and/or skills and competencies described in the pedagogical project of the course. Thus, the performance should be understood in this text according to the Portuguese language dictionary Michaelis: "how to perform a task that will have, later, its degree of efficiency submitted to analysis and appreciation"<sup>(9:1)</sup>.

The improvement in performance throughout the units may be related to the adaptation of students to the method, and the improvement in team performance reinforces the proposal of TBL, which advocates that in addition to acquiring knowledge of the content, the method can provide development of skills such as communication, negotiation and responsibility, important aspects for a nursing professional.

However, it is proposed here to analyze the performance of students in the readiness assurance step, not only taking the average and the percentage of hits, because when the data of the second and third tables are exposed, question by question, student by student, one perceives less uniformity. When determining the desired standard of hits in 70%, the first table shows that, apart from the organization questionnaire, this goal was exceeded as a team, which would allow inferring that part of the learning objectives was achieved by the students, as observed in a study evaluating the application of TBL<sup>(10)</sup>.

Team discussion is a valuable strategy of the TBL, because it allows not only a new

opportunity to visit knowledge, but also the construction of critical thinking through the defense of the point of view, so that, each one arguing and exposing his or her learning, it is possible to reach a consensus. This process encourages students to develop communication and negotiation skills, and the sharing of knowledge enables the recognition of individual potentialities and weaknesses, emphasizing the relevance of this moment in group<sup>(11)</sup>.

Since some students systematically maintained low performance and there were questionnaires and questions where general difficulties of the class were presented, the possibility arises that these may be related to diverse variables, many of them of pedagogical origin, such as pre-class preparation, material made available, preparation of the questions, or even behavior of the students themselves. It is questioned if the material used for previous study, the lack of control of the students who carried out reading, the formulation of the questions of the Organization questionnaire, the dynamics of discussion of the team members and the insufficient incentive for team discussion may have reflected on the performance.

This should remind the professor that, although in a method that favors group work the analysis of the class is valuable, one should also keep the attention on the individual. It is necessary to remember that, for any method to have positive results (not only the TBL), the teaching team must pay attention to each step, not only ensuring that they are carried out, but reflecting on how they are being performed. Thus, although the readiness assurance is the 'picture' of the student's knowledge, in order for it to be well framed, it is relevant to discuss the previous step: pre-class preparation.

Since in flipped methods the student's pursuit of knowledge prior to class is crucial, the quality of this step can influence not only the student's performance, but that of the team. The pre-class preparation within the TBL is the full responsibility of the student, however, the pedagogical preparation of the TBL is the responsibility of the professor and its quality contributes to the fact that, in the tRAT phase, all students can discuss the questions among themselves in order to reduce the possibility that someone who has not studied only accepts the answers of others<sup>(3)</sup>. Thus, at the time of the introduction of work with inverted class methods, it is valid that the professor carefully selects the study material and uses technologies that help him/her to follow this step.

In nursing, there is still little literature in the area of administration. An article that examines the production of theses and dissertations in nursing from 1963 to 2011 identifies that only 7.7% are related to this area, with gaps in themes such as the administrative process, sometimes requiring the use of productions from Administrative Sciences<sup>(12)</sup>. More than a decade ago, it was already pointed out that the knowledge on nursing administration cannot be disconnected from the references of Science of Administration, nor can it be limited to the reproduction of the latter<sup>(13)</sup>.

The book "Administration: theory, process and practice", by Chiavenato<sup>(7)</sup>, for being dense and complex reading, can make the understanding of the subject more difficult. Thus, it can be inferred that the type of material made available can be a variable to influence the student's learning process. The idea that videos are largely responsible for the positive impacts of the implementation of flipped methods should also be highlighted, being considered a gold standard<sup>(14)</sup>.

Flipped methods allow the use of text, but there is strong recommendation for the use of videos<sup>(15)</sup>. Since the Business Process content was a new subject for students, it would have been ideal to have used tools that facilitated and motivated learning. In the need of using text, it is recommended that the reading materials should be easy to understand, simple and not too extensive, so that they can promote learning without demotivating the student<sup>(11,16)</sup>.

As for monitoring, there are technologies that can collaborate with this check by the teaching team, such as Perusall and Active Learning. The use can not only collaborate in a control perspective, but also allow students to have a deep interaction with the material,

as well as, if they are more timid, to feel at ease to manifest themselves and dialogue with the professor about their doubts<sup>(17)</sup>.

Still in relation to the teaching supervision, returning to the readiness assurance, it is added the need of the teaching team to carry out supervision and observation of the tRATs, stimulating the discussion among the team, so that it cannot converge the template only by the answer of the majority or of a specific student, without a previous discussion. Such aspects were observed during the application of TBL and may have influenced the results. It is worth mentioning that the absence of this preparation complexes the development of group cohesion, resulting in resentment of the students who prepared themselves, because they perceive the overload caused by their unwilling and/or less capable colleagues<sup>(18)</sup>.

In the performance analysis of the readiness assurance step, it is also necessary to evaluate the writing of the questionnaire, seeking to evaluate its clarity. The Preparedness Assurance Tests must have a certain complexity<sup>(16)</sup>, in order to provide reflection on the theme and foster subsequent discussion in the group, and the writing of the questions must be, above all, objective and clear<sup>(5,11)</sup>.

Regarding the behavioral factor, the team formation strategy is crucial, as much as the quality of questionnaire elaboration, because, as we could observe, unbalanced teams in engagement, visualized in the low attendance of some members, may have their performance impaired not only by the limitation of discussion, but also by demotivation<sup>(19)</sup>.

The lack of members compromises in the first instance the learning and, in the second instance, the success in the application of the method since it harms the dynamics of tRAT. Team 1, as seen in Table 4, was the one that presented the most absent members. Team performance decreased with the absence of members and responses in iRATs and tRATs remained unchanged, since there was no discussion.

In study<sup>(20)</sup>, most students presented a high degree of responsibility with the readiness assurance step. However, one portion verbalized that sometimes they relaxed, considering that the responsibility was distributed among the group.

Another research<sup>(21)</sup> compared the performance of students in classes with TBL and lectures, showing that the averages increased and the failure rates decreased with TBL. It also brought professor's perceptions that students can see their improvement points and that it allows different ways of thinking. In negative points, some like this work, signaled difficulties in previous reading and in motivating students.

Limitations of the study are the number of participants, having been developed in only one class and the different number of respondents per questionnaire, per unit, which limited the possibilities of establishing statistical correlations.

## CONCLUSION

Considering the objective of analyzing the Team-Based Learning readiness assurance step through the performance of students in Individual Readiness Assurance Test - iRAT and Team Readiness Assurance Test - tRAT, the readiness assurance is analyzed in this article in two of the four steps, from the average of individual and team hits.

The importance of the professors' initiative in using new teaching methodologies is emphasized but bearing in mind that the application does not always mean greater development at the individual level. Pedagogical planning and monitoring are necessary at all steps. It is concluded that teaching attention is required for variables that may influence the step of readiness assurance, making it necessary to plan and constantly

monitor students and teams. As for the latter aspect, given the teaching workload, it is recommended to evaluate the relevance of using methods such as TBL, since they require extra-class availability.

In future studies, it is recommended to evaluate the influence of the pedagogical variables discussed in the student's performance, in order to strengthen the pedagogical content knowledge of nursing professors.

## REFERENCES

1. Mello A de L, Brito LJ de S, Terra MG, Camelo SH. Estratégia organizacional para o desenvolvimento de competências de enfermeiros: possibilidades de educação permanente em saúde. Esc. Anna Nery. [Internet]. 2018 [accessed 08 ago 2020]; 22(1). Available from: <https://doi.org/10.1590/2177-9465-ean-2017-0192>.
2. Brandão HP. Mapeamento de competências: ferramentas, exercícios e aplicações em gestão de pessoas. 2. ed. São Paulo: Atlas; 2017.
3. Menegaz J do C, Dias GAR, Trindade RFS, Leal SN, Martins NKA. Flipped classroom no ensino de gerenciamento em enfermagem: relato de experiência. Esc Anna Nery. [Internet]. 2018 [accessed 11 mar 2020]; 22(3). Available from: <https://pesquisa.bvsalud.org/portal/resource/pt/biblio-953453>.
4. Colln-Applying CV, Giuliano D. A concept analysis of critical thinking: a guide for nurse educators. Nurse Educ Today. [Internet]. 2017 [accessed 13 abr 2020]; 49. Available from: <https://doi.org/10.1016/j.nedt.2016.11.007>.
5. Michaelsen LK, Sweet M. Fundamental principles and practices of Team-Based Learning. In: Michaelsen LK, Parmelee D, MacMahon KK, Levine RE. Team-based learning for health professions education: a guide to using small groups for improving learning. [Internet]. Virginia: Stylus Publishing; 2008 [accessed 13 abr 2020]. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2670235/>.
6. Polit DF, Beck CT, Hungler BP. Fundamentos de pesquisa em enfermagem: métodos, avaliação e utilização. 9. ed. Porto Alegre: Artmed; 2018.
7. Chiavenato I. Administração: teoria, processo e prática. 5. ed. Barueri: Manole; 2014.
8. Mazur E. Peer Instruction: a revolução da aprendizagem ativa. Porto Alegre: Penso; 2015.
9. Michaelis. Dicionário Brasileiro da Língua Portuguesa. [Internet]. Desempenho. [accessed 12 mar 2020]. Available from: <http://michaelis.uol.com.br/busca?r=0&f=&t=&palavra=desempenho>.
10. Kim HR, Song Y, Lindquist R, Kang HY. Effects of team-based learning on problem-solving, knowledge and clinical performance of Korean nursing students. Nurse Educ Today. [Internet]. 2016 [accessed 13 abr 2020]; 38. Available from: <https://doi.org/10.1016/j.nedt.2015.12.003>.
11. Krug R de R, Vieira MSM, Maciel MV de A e, Erdmann TR, Vieira FC de F, Koch MC, et al. O "Bê-Á-Bá" da aprendizagem baseada em equipe. Rev. bra. educ. med. [Internet]. 2016 [accessed 13 abr 2020]; 40(4). Available from: <https://doi.org/10.1590/1981-52712015v40n4e00452015>.
12. Meneses AS de, Sanna MC. Estrutura do conhecimento sobre administração em enfermagem na pós-graduação brasileira. Texto contexto - enferm. [Internet]. 2016 [accessed 13 abr 2020]; 25(1). Available from: <https://doi.org/10.1590/0104-0707201500000380015>.
13. Sanna MC. A estrutura do conhecimento sobre administração em enfermagem. Rev. bras. enferm. [Internet]. 2007 [accessed 13 abr. 2020]; 60(3). Available from: <https://doi.org/10.1590/S0034-71672007000300017>.

14. Wozny N, Balsler C, Ives D. Evaluating the flipped classroom: a randomized controlled trial. *J Econ Educ* [Internet]. 2018 [accessed 13 abr 2020]; 49(2). Available from: <http://dx.doi.org/10.1080/00220485.2018.1438860>.
15. Bergmann J, Sams A. Sala de aula invertida: uma metodologia ativa de aprendizagem. Rio de Janeiro: LTC; 2015.
16. Karaca C, Ocak M. Effect of flipped learning on cognitive load: a higher education research. *J Lear Teac Dig Age*. [Internet]. 2017 [accessed 08 ago 2020]; 2(1). Available from: <https://www.learntechlib.org/p/209533/>.
17. Lee SC, Yeong FM. Fostering student engagement using online, collaborative reading assignments mediated by Perusall. *The Asia Pacific Scholar*. [Internet]. 2018 [accessed 13 abr 2020]; 3(3). Available from: <https://doi.org/10.29060/TAPS.2018-3-3/PV2000>.
18. Bollela VR, Senger MH, Tourinho FSV, Amaral E. Aprendizagem baseada em equipes: da teoria à prática. *Medicina (Ribeirão Preto)*. [Internet]. 2014 [accessed 13 abr 2020]; 47(3). Available from: <https://doi.org/10.11606/issn.2176-7262.v47i3p293-300>.
19. Watkins K, Forge N, Lewinson T, Garner B, Carter LD, Greenwald L. Undergraduate social work students' perceptions of a team-based learning approach to exploring adult development. *JTeac Soc Work*. [Internet]. 2018 [accessed 13 abr 2020]; 38(2). Available from: <https://doi.org/10.1080/08841233.2018.1439428>.
20. Branney J, Priego-Hernández J. A mixed methods evaluation of team-based learning for applied pathophysiology in undergraduate nursing education. *Nurse Educ Today*. [Internet]. 2018 [accessed 13 abr 2020]; 61. Available from: <https://doi.org/10.1016/j.nedt.2017.11.014>.
21. Marques APAZ, Vilhegas VPP. A experiência do team based learning. In: Encontro Toledo de Iniciação Científica; 2015 Set. p.1-16; Presidente Prudente, Brasil. Presidente Prudente: Centro Universitário Antônio Eufrásio; 2015.

**HOW TO REFERENCE THIS ARTICLE:**

Menegaz J do C, Dias ACC, Santos AVAJ dos, Souza CSS de, Figueiredo MCC, Ferreira GRON. Analysis of the readiness assurance step of the team based learning in nursing teaching. Cogitare enferm. [Internet]. 2021 [accessed "insert day, month and year"]; 26. Available from: <http://dx.doi.org/10.5380/ce.v26i0.72318>.

Received: 18/03/2020

Approved: 06/10/2020

**Corresponding author:**

Jouhanna do Carmo Menegaz

Universidade Federal do Pará – Belém, PA, Brasil

E-mail: [jouhanna@ufpa.br](mailto:jouhanna@ufpa.br)

**Role of Authors:**

Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work - JCM, ACCD, AVAJS, CSSS, MCCF, GRONF

Drafting the work or revising it critically for important intellectual content - JCM, ACCD, AVAJS, CSSS, MCCF, GRONF

Final approval of the version to be published - JCM, ACCD, AVAJS, CSSS, MCCF, GRONF

Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved - JCM



Copyright © 2021 This is an open access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original article is properly cited.