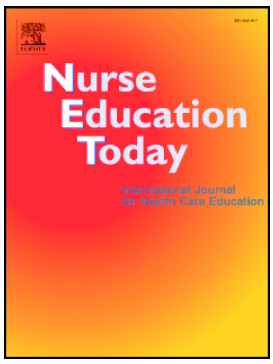

Innovative pedagogical practices in higher education: An integrative literature review

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PII: S0260-6917(18)30775-5
DOI: doi:10.1016/j.nedt.2018.10.003
Reference: YNEDT 3993

To appear in: *Nurse Education Today*

Received date: 20 February 2018
Revised date: 24 September 2018
Accepted date: 4 October 2018

Please cite this article as: Júlia Santos, Amélia Simões Figueiredo, Margarida Vieira , Innovative pedagogical practices in higher education: An integrative literature review. Ynedt (2018), doi:10.1016/j.nedt.2018.10.003

Article title: INNOVATIVE PEDAGOGICAL PRACTICES IN HIGHER EDUCATION: AN INTEGRATIVE LITERATURE REVIEW

Word count: 4484

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Authors' appointments:

For the purpose of publication of the article, we must mention that this is not published in any other journal. It is an original work, in which all the authors contributed intellectually to its elaboration, thus not existing conflicts of interest.
All authors have read and approved the final version of the manuscript and, in the event of publication, transfer the copyright to the publisher.

ABSTRACT

Background: Higher education teachers are increasingly challenged to adopt student-centered approaches.

Aims: To determine the strategic guidelines which promote a conceptual change in higher education students, in the context of student-centered approaches to teaching.

Methodology: Integrative literature review, using the PICO method, applied to the ERIC and EBSCO electronic databases. We analyzed 10 articles that were published between 2012 and 2016.

Results: We identified four thematic categories: dissonance between concepts and approaches to teaching; mixed approaches with ICTs association; digital simulation; approaches employed in large classes.

Conclusion: The use of new pedagogical practices promotes the involvement of students, improves critical and creative thinking, reduces apathy and contributes to peer-learning.

Keywords: Approaches to teaching; students; learning; higher education.

INTRODUCTION

In an attempt to respond to the demands of today's world, teachers have been abandoning the traditional model of content memorization and verification, seeking to train critical and reflexive professionals, capable of solving problems. On the educator's side, we expect competency-oriented skills and the ability of enabling the students to participate actively in the learning process (Hoffmann & Koifman, 2013). Prosser, Trigwell and Taylor (1994) defined two major types of approaches to teaching: Conceptual Change/Student-Focused" (CCSF) and "Information Transmission/Teacher-Focused" (ITTF). The approaches to teaching are constituted by an intention (conception) and a strategy (Prosser & Trigwell, 2000). In a perspective of knowledge transmission, teaching is typically associated with a content approach, in which students are regarded as passive receivers of knowledge. In that context, learning consists of remembering and reproducing the right answers or solutions, and/or memorizing facts. In contrast, teaching viewed as knowledge facilitation is typically linked to a learning approach to teaching (Kember & Kwan, 2000). In this kind of approach, the aim is to change and challenge the students' concepts with respect to learning, and the latter is seen as a process in which

students construct their own understanding. The focus is on insight, critical thinking and knowledge application.

It was based on this complex relationship between teaching approaches focused on the students and deep learning that we elaborated the following research question: "Which are the strategic teaching orientations that promote conceptual change in the higher education student?"

METHODOLOGICAL PROCEDURES

We conducted an Integrative Literature Review. This research method follows six distinct phases: 1) identification of the theme and selection of the integrative review's guiding question; 2) establishment of criteria for the inclusion and exclusion of studies; 3) definition of the information to be extracted from the selected studies/categorization of the studies; 4) evaluation of the studies included in the integrative review; 5) interpretation of results; 6) presentation of knowledge review/synthesis (Whittemore & Knafl, 2005). In this perspective, the PICO strategy (Population, Intervention, Comparison, and Outcome) was applied, as recommended by the method defined in the Cochrane Handbook (Higgins & Green, 2009).

We defined as inclusion criteria: articles indexed with full text; articles regarding student-focused approaches to teaching; studies concerning higher education participants; articles with a subject relevant to this review's purpose; works published between January 2012 and July 2016.

We used the MEDLINE and CINAHL databases, from the EBSCOhost research platform, and the ERIC education database. The descriptors (MeSH term) used were: "Teaching approaches" and "Higher education". To combine the former terms, we applied the Boolean operator "AND", leading to the expression "Teaching approaches AND Higher education". The search was conducted during the last week of July 2016 and resulted in 176 articles. After applying the inclusion criteria, only the ERIC database provided suitable articles, since the search in the MEDLINE and CINAHL databases did not generate adequate results, as explained in Flowchart 1.

Flowchart 1 – Article selection process

While selecting the studies, we followed the PRISMA guidelines (Moher, Liberati, Tetzlaff, Altman & Group, 2009), resulting in an analysis *corpus* of 10 articles.

The 10 articles were subjected to a critical evaluation, conducted independently by two reviewers, which was followed by a consensus meeting, and were thoroughly read by both reviewers. The latter evaluated the inclusion criteria and each article's methodological quality, based on the grid provided by the Centre for Evidence-Based Medicine (CEMBE) – Faculty of Medicine, University of Lisbon.

PRESENTATION AND DISCUSSION OF RESULTS

The 10 articles were re-analyzed by both reviewers, taking into account their methodological quality. In order to do so, the reviewers read the full text and applied a form to evaluate the inclusion criteria. The grid used for this critical evaluation was provided by the CEMBE. According to it, a study must obtain a score greater than, or equal to, 75%, to be considered a quality study (Carneiro, 2008). Two studies were conducted respectively in the United States of America (USA), Malaysia and Australia, and the remainder took place in Norway, Portugal, the UK and South Africa, with one study conducted in each. Regarding the adopted methodologies, there was a predominance of studies using both quantitative and qualitative methodologies.

Table 1 presents the main evidence found in each study.

Table 1 – Main scientific evidence found in the studies

From the interpretation of the obtained results, four thematic categories emerged:

Dissonance between teaching concepts and teaching strategies

In this first thematic category, we include studies 1 and 4 (E1 and E4), which analyze the difference between what teachers believe they achieve with teaching and what they actually achieve.

E1 focuses on the teachers' experiences during the implementation of peer-assessment in first semester classes. Both the concepts and the approaches are described as being learning-focused, or content-focused. From the analysis of the interviews, the researchers discovered that one of the participants had a consonant view of the relationship between teaching concepts and strategies (peer-assessment), while the remaining seven described their teaching concepts and approaches to peer-assessment using a combination of

learning-focused and content-focused statements. Such statements were labeled as dissonant, like Postareff *et al*. (2008), who uses the terms "dissonant" and "consonant" to describe teacher profiles. The profiles include different aspects of the teaching practice, as well as the teacher's differing approaches to peer-assessment. A higher qualitative learning outcome can be expected in classes where teachers exhibit consonant teacher profiles, whereas a lower qualitative learning outcome can be expected when teachers present dissonant teacher profiles (Prosser *et al*., 2003). The authors refer the sample size as a limitation of their study.

E4 is based on a collaborative learning strategy. It examines the perspectives of three populations (faculty members, graduate students and undergraduates), to investigate the role of faculty professional development in reforming the undergraduate classes. Concerning the raised questions, the data showed that: 1) group work was considered important by 70% of the graduate students, but only by 50% of the seniors and by 55% of the faculty members, and GTAs (Graduate Teaching Assistants), when compared to seniors, rated group work as significantly more important; 2) the faculty members reported using group work less often than might be expected. In all groups, the majority of the participants attributed a high value to active learning and conceptual understanding. However, when reported beliefs and practices were compared, it was found that faculty members did not always apply active learning techniques, which seems to be dissonant. The authors suggest providing professional development opportunities to faculty members, as well as instructional support from educational sciences and from related technology specialists. Faculty members who were inserted in teaching-focused communities reported using innovative practices more often than those who were not inserted in such communities.

Mixed approaches that resort to Information and Communication Technologies (ICTs)

Studies 2, 3, 5, 9 and 10 (E2, E3, E5, E9 and E10) are included in this category, which associates ICTs with the existing teaching strategies.

In E2, a strategy of collaborative and cooperative teaching was employed. The article presents the findings of a project that examined the interface between Peer Assisted Learning (PAL) and e-Learning. These pedagogical developments have been paired with increased insights concerning the role of social and cultural interactions in learning,

including the role of PAL. The interface between PAL and e-Learning provided an important context for rethinking the manner in which tutorials and lectures can be used as a basis for collaborative learning, by students and lecturers alike. In this sense, it allowed to verify that: 1) the use of online materials and the elaboration of individual digital responses created a context where the lecture did not need to focus on the transmission of the unit's content, but rather on the exploration and sharing of that content; 2) PAL and e-Learning were associated with the creation of a learning context in which students could participate in open discussions, interact with others and share ideas; 3) they also provided opportunities for peer-learning and peer-interaction.

E3, which is based on the strategic orientation of the Problem-Based Learning (PBL) teaching approach, reveals how an e-Learning creation tool – named Scenario Based Learning Interactive (SBLi) – was implemented, in order to develop PBL materials capable of challenging students to learn through their involvement in real problems. SBLi is an easy-to-use and multi-disciplinary e-Learning tool, for the creation of self-paced learning activities. In the four analyzed case-studies, virtual scenarios were created – a veterinary hospital, a laboratory, illustrations for abstract mathematical concepts, and an imaginary model of genetic analysis. This allowed the students to interact with complex and realistic problems, conceived within a PBL methodology framework. This served to deepen the learning outcome, and to promote critical thinking, problem solving and decision making. It also enabled the rapid identification of the strengths and weaknesses of learning, through an immediate online feedback. This methodology appears to help the transformation of student understanding from mere knowledge and comprehension to the application of knowledge, and even its analysis.

E5, which employs strategies of active and collaborative teaching in a Portuguese university, describes a specific environment that uses collaborative tools – like wikis and forums, within an e-Learning platform – and a specific Customer Relationship Management software. Given the results, we can see that collaborative learning environments lead the students to a more active involvement in the learning process, and, consequently, to a better academic outcome. Despite the class's heterogeneity, the students were receptive and motivated, while performing the different activities which were proposed. However, the students often delayed their contribution to the activities and made little use of the potential to develop content in a collaborative manner, through the wiki tool. This study also alerts to the interaction between the usage of future professional elements and the different leaning attitudes.

E9 analyzes the use, by students, of wikis, blog posts and a discussion forum, within a mixed learning environment. The blend of these teaching strategies has permitted the students to become closer to real-world experiences, by giving them an opportunity to engage in a real-world activity. This made learning more meaningful and relevant, regarding what they would be required to do outside of the learning environment. In addition, the students felt that they were able to link their task to other areas and to broaden their knowledge. One of the main limitations of this study is that it used the perceptions of students from a conveniently selected sample, and only the positive experiences (as expressed by the students) were discussed.

E10 associates the web with participatory learning, through two photography programs. Based on the students' reflections and discussions in the classroom, the students were challenged by images, which stimulated: their thinking about the health culture, their conversations and exchanging of messages with colleagues about the images and health, and the development of better critical thinking skills. It also allowed the students to work in groups (while being asynchronously online), to engage in group discussions, or to complete their portion of the assignment independently. This is a helpful approach to manage a larger class and to avoid some of the typical problems of group work (not meeting group deadlines). The aggregating function of the teacher is emphasized, both at the level of the job description, and at the level of the classroom discussions. However, many students are cognitively disengaged and expect good grades purely by memorizing information, with limited dedication. The less engaged students tended to show very little variation across the different response categories, reflecting minimal creative thought, engagement and/or critical thinking. In addition to the resistance to an alternative assignment formatting, there is also some resistance to the development of ICTs.

Digital Simulation

E6 used Immersive Learning Simulations (ILS), having, as participants, busy adult students, with jobs, families and real lives that simply would not accommodate the conventional college experience. A variety of online tools was employed, in order to stimulate the students' involvement and to support a deeper learning. The participants had to present the results of their final projects, using the simulation. The students had to interact with a variety of characters, communicating with them through audio and video. There were "Virtual Mentors", who provided information to the students (based on key

learning objectives), and "Inquisitors", who asked questions to test the students' understanding. Feedback was given to the students during the development of the activity – concerning key concepts and the improvement of presentation practices. To evaluate the students' reaction, an "Exit Survey" was delivered, with the intention of collecting both quantitative and qualitative feedback, through the students' responses. In education, embedding simulations supports the transition to a student-centered approach, where the students have more control, regarding how and when they learn. This study demonstrated the ILS' ability to increase the students' engagement and to promote a deeper learning. However, this matter will require further research.

Pedagogical approaches in large classes

E7 was triggered by the doubling of students in two years. Moving away from the lecture model, a "Flipped Classroom" approach was used. This study consisted of two cycles. During the first cycle, the students attended an online class, as homework, before each presential class. Within the classroom, they were also involved in active learning, working in real-world projects, in order to understand the context of the taught subject. Peer-education activities, problem-based learning, collaborative work and research-based learning were combined in this cycle. The second cycle involved learning activities that took place in the classroom, focusing on the exploration of concepts. The students who did not attend the online lecture, before the presential class, were invited to view it at the beginning of the lesson and to integrate the learning activities afterwards. Most students were able to associate new ideas with their previous knowledge, and to apply the information to real-world activities, while valuing peer-learning. When included in small groups, the students also developed their social skills (communication), and the technology-infused class allowed personalized teaching.

E8 reports an evaluation of lecture-based active learning and formative assessment techniques. Whilst lectures are seen as effective with respect to the transmission of information to a large cohort of students, they apparently possess a limited efficacy regarding the development of higher-order thinking skills. Active learning is seen as a more powerful tool, yet it is much easier to implement within smaller groups of students. Students were invited to write what they thought were the lecture's key messages. This was followed by comments from peers and a discussion in class. Considering the students' perspective, those comments were grouped around two major themes: content

involvement and retention. Nonetheless, the study suggests the development of future research, integrating the students' individual characteristics.

From the analysis of the articles mentioned above, several strategic teaching orientations emerged, which can be integrated in the pedagogical practice. Peer evaluation, formative evaluation, active and collaborative learning, flipped classrooms, and mixed approaches with ICTs association (participatory, lectures, PBL), were highlighted. The category "Mixed Approaches with ICTs Association" encompassed a larger number of studies. This reflects the literature, which indicates that pedagogical practices should be diversified, in order to meet the needs of *all* students (Silva & Lopes, 2015). It was possible to observe that, in large groups, where the traditional approaches persist, transformation is achievable with new strategies (flipped classrooms; formative assessment). It was also verified a persistent dissonance between the teachers' beliefs, concerning teaching, and the pedagogical strategies they claimed to apply, corroborating the study by Lopes (2013). All the pedagogical strategies examined in this review provide a deep learning to the students, while improving their ability to communicate, and interact, with their peers and teachers. The teachers revealed a greater satisfaction, involvement, and ability to provide immediate feedback to the students.

CONCLUSIONS

Four thematic categories have emerged from this review: dissonance between teaching concepts and teaching strategies; mixed approaches with ICTs association; digital simulation and approaches to teaching in large classes. Regarding the students, all the strategies examined in this review result in: greater motivation and consequent involvement with unit contents and the course; development of critical and reflective thinking; higher level of cognitive skills and, consequently, deep learning. They also improved their ability to communicate and interact with peers, as well as with teachers, despite some difficulties, such as: delays in their contribution to the proposed activities; obstacles in the development of collaborative content; persistent difficulty in being critical and creative. There was a need to associate ICTs with traditional strategies (lectures), as well as with current strategies (PBL, active learning and collaborative learning). The large classes required the integration of new approaches (flipped classrooms, active learning and formative assessment). Digital simulations contributed to a deeper learning, by resorting to authentic learning environments. In some contexts, it was noticeable a prevailing dissonance between the teachers' beliefs, concerning

teaching, and the pedagogical strategies (collaborative learning and peer evaluation) they claimed to apply.

Some studies reported a greater satisfaction of teachers, involvement, and the possibility of providing immediate feedback to the students, despite the difficulties inherent to the adoption of a new practice that is more time-consuming and causes more anxiety. Changing the teachers' beliefs, with respect to teaching, will be the first necessary step towards a reform in education (Biggs, 2005; Wieman et al., 2010). As the revised studies point out, teachers cannot change their beliefs autonomously. So, professional development opportunities and the support of colleagues are considered necessary to consolidate sustainable changes regarding higher education teachers.

The fact that we did not evaluate the quality of the included studies constitutes a limitation of this review.

Because this is a recent issue, we present here a set of results that can be transferred to the pedagogical practice. At the same time, we consider pertinent, and advisable, to maintain updates concerning this research, as well as to develop further studies.

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Flowchart 1 – Article selection process

Table 1 – Main scientific evidence found in the studies

Study/ Country	Type of study/ Participants/ Sample	Objectives	Data collection method/ Teaching strategy	Results
E1. Sandvoll, R. (2014). When intentions meet reality: Consonance and dissonance in teacher approaches to peer-assessment. *Canadian Journal of Higher Education*, 44(2), 118–134. Norway.	Qualitative study. Teachers from a Norwegian University. n=8	To identify the relationship between the teachers' education concepts and their peer-evaluation approaches.	Semi-structured interview. Peer-evaluation.	One of the eight teachers presented a direct relationship between his/her teaching concepts and the peer review approach, reflecting a logical combination of "learning-centered" learning concepts and "student-centered" approaches to peer-learning.
E2. Edwards, S. & Bone, J. (2012). Integrating Peer Assisted Learning and e-Learning: Using Innovative Pedagogies to Support Learning and Teaching in Higher Education Settings. *Australian Journal of Teacher Education*, 37(5), 1–12. Australia.	Experimental (qualitative and quantitative). Students from the Infant Education Course. n=90	To explore the interface between Peer Assisted Learning (PAL) and e-Learning, as a way to develop an alternative approach to the traditional face-to-face lecture; to determine the students' perception of the relationship between PAL and e-Learning, with regard to their perceived acquisition of the unit's content; to examine the students' response to their participation in the alternative lecture, comparing it to their existing perspectives about the role of the traditional lecture in learning.	Lecturer discussions, collection of samples of the students' work, student survey, and student focus group. PAL and e-Learning.	The new approach increased the students' understanding of the unit's content; it allowed them to think deeply about the contents; it enabled the presentation and sharing of content designed for their colleagues and teachers; it made them responsible for creating and understanding the unit's content. It also gave the students the ability to discuss, interact with others and share ideas. The alternative lecture was described as more interesting, engaging and supportive of learning. The interface between PAL and e-Learning created a space of constructive peer-based dialogue, rather than

				being a situation in which knowledge was transmitted to students.
E3. Blackburn, G. (2015). Innovative e-Learning: Technology Shaping Contemporary Problem Based Learning: A Cross-Case Analysis. *Journal of University Teaching & Learning Practice*, 12(2), 1–17. Australia.	Multi-case design, in three universities, located in Australia, New Zealand and the United Kingdom (cross-case analysis). Teachers and students. n=4 cases	To analyze how an e-Learning creation tool, SBLi, has been implemented to develop Problem Based Learning (PBL) materials that challenge students to learn through real-world problems; to enlighten how the teaching staff can adopt technology-based approaches to create multi-disciplinary interactive PBL environments, that lead to a change in the students' thinking, decision making, problem solving, and/or critical thinking.	Semi-structured lecturer interviews, telephone interviews, e-mail correspondence and published works; students' questionnaire. PBL using SBLi technology.	This approach proved to be more interesting and appropriate: it reduced the difficulties in dealing with abstract concepts, it increased the students' responsibility for the learning process in itself, and it promoted the students' reflexive nature, critical thinking and problem solving skills. It involved the students in activities that provided immediate feedback and reinforced the integration of competencies, providing motivation for higher levels of rigor. Prepared the students to become effective individuals, when entering the professional world. From the teacher's perspective, it constitutes a new and stimulating development, regarding the evaluation of the students' competencies.
E4. Marbach-Ad, G. *et al*. (2014). Science Teaching Beliefs and Reported Approaches Within a Research University: Perspectives from Faculty, Graduate Students, and Undergraduates.	Quantitative study, with a mixed-method analysis. Students and teachers from the Faculty of Chemistry and Life Sciences.	To understand: which teaching approaches teachers believe to be more important; which teaching approaches teachers prefer to use; which college-related professional development opportunities teachers believe to be	Online questionnaire, with open questions. Collaborative and cooperative.	Most students and teachers attribute a high to active learning and conceptual understanding. The majority of the interviewed teachers did not always employ active learning techniques.

International Journal of Teaching and Learning in Higher Education, 26(2), 232–250. USA.	n=288 students; 99 GTAs; 71 faculty members	helpful, concerning their teaching.		Strong correlations were found between the faculty members' beliefs about the importance of working in groups and their practice, because the professionals who believed that this skill was important also used that approach more often in their classroom.
E5. Pinheiro, M. M. & Simões, D. (2012). Constructing knowledge: an experience of active and collaborative learning in ICTs classrooms. *TOJET: The Turkish Online Journal of Educational Technology*, 11(4), 382–389. Portugal.	Quantitative study. Students from the University of Aveiro. n=28	To explore how collaborative environments, which derive from using ICTs, involve students actively in the learning process; to understand how collaborative tools, at the workgroup level, influence the students' autonomous learning regulation; to clarify how the handling of professional elements, perceived as such by students, can lead them to adopt different learning attitudes.	Questionnaire. Active and collaborative.	To contribute to the students' active involvement in the learning process, especially if the tasks to be performed possess an empirical component. Students identify the need to regulate their own learning, and that reinforces the planning and regulation of collaborative activities, as well as the role of the ICTs synchronous and asynchronous options.
E6. Beckem, J. M. & Watkins M. (2012). Bringing life to learning: immersive experiential learning simulations for online and blended courses. *Journal of Asynchronous Learning Networks*, 16(5), 61–71. USA.	Quantitative and qualitative study. Students from the Business Course (SUNY). n=98	To provide empirical evidence of the benefits associated with Digital Media simulations.	Questionnaire with open questions. Digital simulation.	Increased the students' engagement and have promoted a deeper learning.
E7. Danker, B. (2015). Using Flipped Classroom Approach to Explore Deep Learning in Large Classrooms. *The IAFOR Journal of Education*, 3, 171–186.	Action research, in line with the research query. Students from the Arts Course.	To get acquainted with the teaching designs that can be used in situations of extensive classes, in order to increase the interaction between the teacher and the student, and between the	Questionnaires, short interviews and observation. Researcher's personal reflections. Flipped classroom.	Engaged students at a deeper level. It heightened their curiosity and involved them in the development of higher thinking skills.

Malaysia.	n=19	students, and stimulating a deeper learning.		Increased the interaction between the teacher and the students, as well as among students.
E8. Winstone, N. & Millward, L. (2012). Reframing perceptions of the lecture from challenges to opportunities: Embedding active learning and formative assessment into the teaching of large classes. *Psychology Teaching Review*, 18(2), 31–41. United Kingdom.	Quantitative and qualitative study. Students and teachers from the Psychology Course. n=120 students; 2 teachers	To understand how the students experience the use of active learning and formative assessment techniques, in large groups, where lectures are employed as an approach to teaching.	Questionnaire with open questions. Active learning/formative evaluation.	Students' perspective: an increase was verified in both motivation and involvement. Teachers' perspective: it was noticeable an increased involvement with the content, as well as the reinforcement of the students' motivation. Favored the involvement and personal development of the teachers, although it expanded the preparation time and raised their anxiety levels.
E9. Titus, S. (2013). Mediating authentic learning: The use of wiki's and blogs in an Undergraduate curriculum in South Africa. *International Conference on Educational Technologies*, 2–14. South Africa.	Qualitative study. Students from the Sports Science Course. n=88	To investigate how the emerging technologies can mediate authentic learning in sport science education, in the context of a Health Sciences' curricular unit.	Reflective blog. ICTs, Authentic learning.	Improved the involvement, interaction and communication among the students, and also between them and the teacher. The students seemed to value learning and peer-evaluation, and were able to reflect about their own learning process. They were able to interconnect their tasks with other curricular units and to expand their knowledge.
E10. Ott Walter, K.; Baller, S. L. & Kuntz, A. M. (2012). Two Approaches for Using Web Sharing and Photography Assignments to Increase Critical Thinking in the Health	Qualitative study. Students from the Health Sciences Course. n=75	To use photography as a catalyst for the promotion of critical thinking, creativity, involvement and problem solving.	Written reflections. Photography and web technology. Participatory learning.	Allowed the development of: critical thinking; engagement; deeper learning skills; comprehension of the more complex concepts and processes; to acquire new

Sciences. *International Journal of Teaching and Learning in Higher Education*, 24 (3), 383–394. Malaysia.		information and to build knowledge beyond the one that previously existed. Supported the transition to a student-centered approach. The students exhibited a persistent difficulty to think creatively and critically.

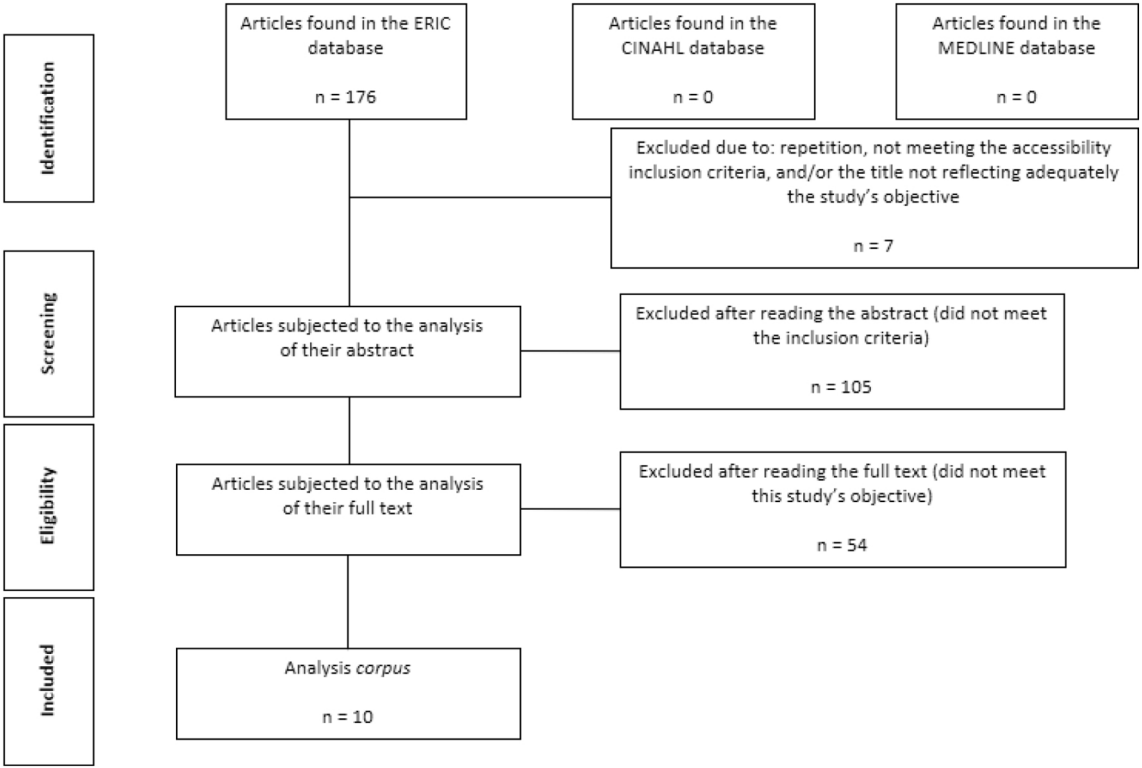
Identification
Screening
Eligibility
Included
Articles found in the ERIC database
n = 176
Articles found in the CINAHL database
n = 0
Articles found in the MEDLINE database
n = 0
Excluded due to: repetition, not meeting the accessibility inclusion criteria, and/or the title not reflecting adequately the study's objective
n = 7
Articles subjected to the analysis of their abstract
Excluded after reading the abstract (did not meet the inclusion criteria)
n = 105
Articles subjected to the analysis of their full text
Excluded after reading the full text (did not meet this study's objective)
n = 54
Analysis *corpus*
n = 10

Figure 1