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ARTICLE

GOOD PRACTICES IN VIRTUAL TEACHING AND LEARNING ENVIRONMENTS: A SYSTEMATIC LITERATURE REVIEW

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ABSTRACT: This paper discusses good practices in the virtual teaching and learning environments. It aims to list the best practices available on literature, as well as to identify difficulties in its application and possible solutions. Thus, a systematic literature review was conducted. As a result, beyond listing good practices, were identified some difficulties in the implementation of such models. It was observed that such obstacles revolve around approaches of the teachers' digital competences and the use of collaborative learning tools. In this sense, the research suggests as continuation in future works, the execution of teacher improvement programs and the development of a model with the unifying good practices identified in the literature, aiming to contribute in the technological mediation of complex processes such as the preparation of academic papers.

Keywords: Virtual teaching and learning environments, good practices, higher education.

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BOAS PRÁTICAS EM AMBIENTES VIRTUAIS DE ENSINO E DE APRENDIZAGEM: UMA REVISÃO DE FORMA SISTEMÁTICA NA LITERATURA

RESUMO: Este artigo apresenta como tema boas práticas em Ambientes Virtuais de Ensino e de Aprendizagem - AVEA. Seu objetivo, além de elencar melhores práticas na literatura, visa identificar dificuldades e soluções em sua aplicação. Assim, realizaram-se diversas buscas bibliográficas de forma sistemática, para selecionar trabalhos relacionados a boas práticas em plataformas virtuais. Como resultado do método de pesquisa, além de melhores práticas aplicadas em AVEA, para efetivar a mediação do processo de ensino e aprendizagem, também identificaram-se algumas dificuldades em sua implementação. Constatou-se que esses obstáculos giram em torno de abordagens sobre competência digital docente e uso de ferramentas de aprendizagem colaborativa. Nesse viés, a pesquisa sugere, como continuidade em trabalhos futuros, a execução de programas de aperfeiçoamento docente e o desenvolvimento de um modelo com a adaptação e unificação das boas práticas identificadas, visando contribuir na mediação tecnológica de processos complexos como a elaboração de trabalhos acadêmicos.
Palavras-chave: Ambientes virtuais de ensino e de aprendizagem, boas práticas, ensino superior.

INTRODUCTION

Considered as a resource that has become part of the daily routine in academy, Virtual Teaching and Learning Environments (VLE) have been gradually gaining space in higher education institutions as a teaching and learning tool (DAHLSTROM; BROOKS; BICHSEL, 2014). However, even with their daily practice, some limitations of pedagogical mediation, time management and technological skills, identified by Robb and Fisher (2015), still constitute a great challenge for education in higher education.

Researches by Dahlstrom, Brookse and Bichsel (2014) report the valuation of the virtual environments by students and teachers, but identify a greater use of basic resources of the tool/platform, such as a repository of information, and denounce the low utilization rate of its various collaboration and interaction resources. The authors defend the need for new proposals to optimize the use of these platforms, making effective the realization of some processes. In this sense, new studies emerge that recommend new methodologies for teaching and

learning through such educational platforms. These researches are gradually being carried out and present as a result practices or good practices in the use of VLE in the educational process.

The term "best practices" or "good practices" is related to the performance of specific activities effectively (GATTORNA, 1998), always aiming to identify the best method to perform a certain task. In APO's (2009) design, "good practice" describes the process of developing and following a standard way of doing things, emphasizing that such practices are flexible, and are based on continuous learning and improvement. In the educational context, few studies related to good practices are identified, highlighting the seven Principles of Good Practices in Higher Education (CHICKERING; GAMSON, 1987) and, later, with the advent of technological resources and their use in higher education, Salmon (2000) lists the five stages of student orientation (mediation) in online teaching and learning environments.

In this context, Lopez and Eldridge (2010) highlight the scarcity of literature identifying structures, standards for the adequacy of the implementation and dissemination of best practices for the construction of knowledge. In this sense, and through the need to use the resources and tools of VLE efficiently and effectively, the following research question was identified: *How good practices in VLE can contribute to the teaching and learning process and what difficulties are encountered in their implementation by higher education institutions?*

Thus, in order to meet the objective of the research to identify, through systemic searches in the literature, best practices for the use of VLE, their contributions according to the scenario applied, and the gaps faced by educational institutions regarding the implementation of such actions, it was first necessary to "look back". To do so, through exploratory searches in the literature, were identified studies related to good practices in higher education, which will be addressed in section two (2) - theoretical framework. In section three (3), the methodological steps are presented. In order to analyze all studies in the literature (articles specified as review articles and peer-reviewed articles) related to good practices in VLE, systematic searches were made and presented and analyzed in section four (4). This research becomes relevant since its result, besides identifying good practices for the use of VLE, the scenario applied, and its contributions, evidenced the difficulties encountered, pointing out possible solutions through the selected bibliographies.

LOOKING BACK - GOOD PRACTICES IN HIGHER EDUCATION AND LEARNING GUIDELINES MEDIATED IN VLE

Teaching and learning are considered complex and often unstable processes because they encompass dynamic cognitive systems. In an attempt to structure better teaching models, Chickering and Gamson (1987) identified in their research seven (7) practices aimed at improving not what is taught, but how knowledge is shared. These principles are considered as guidelines, for both teachers and students, being them (CHICKERING; GAMSON, 1987; SANTOS, 2001):

i. **Encourage contact between students and teachers** - Encourage, through events, greater involvement of the students with the institution and encourage greater interaction between student and teacher;

ii. **Develop reciprocity and cooperation among students** - Use practices of activities involving groups or teams in a collaborative way, not encouraging individual competitiveness;

iii. **Use active learning** - Perform more dynamic activities, through experiences, real life examples and practical exercises;

iv. **Prompt Feedback** - Provide adequate and continuous feedback on student performance, identifying what you have learned and what you need in your learning studies;

v. **Emphasize time on task** - Teach students how to use time effectively, minimizing their wastage in less relevant processes;

vi. **Communicate high expectations** - Create a challenging climate for the student in class, resulting in higher income, higher attendance rate and greater sense of responsibility;

vii. **Respect diverse talents and ways of learning** - Emphasize innovation on teaching methods covering diverse styles of learning and encourage students to improve their knowledge.

Chickering and Gamson (1987) emphasize that, for adverse reasons, good practices are used in different ways in higher education and implemented according to the need of each academic phase. In this context, it is necessary to constantly improve these methods, since the process of knowledge construction, continuous and dynamic, has been gradually changing due to the ubiquity of Information

and Communication Technologies (ICT). The knowledge society, which according to Pérez-Escoda and Rodríguez-Conde (2015), disseminates, transforms and builds knowledge through ICT, imposes the imperative use of such resources, and requires actions in the educational context aimed at meeting such demand. Thus, new teaching strategies that strengthen aspects related to literacy and digital literacy are needed (UNESCO, 2013).

One of the actions carried out by educational institutions is the use of educational platforms as an auxiliary tool to the teaching and learning process. Such a resource enables, in addition to greater interaction between the student and the object of study, the mediation of learning through different technologies. In order to make this process more efficient, Salmon (2000) points out the importance of student orientation in the use of such tools. In this scenario, Salmon (2000) elaborated some steps with the objective of assisting in the mediation of the teaching and learning process in LVE. The steps begin as learners become more experienced in learning and working together, and contribute to greater interaction in virtual environments.

The stages developed by Salmon (2000) address:

i. **Access to the system and motivation** - forms of access and methods for teachers/instructors/moderators to motivate students;
ii. **Socialization** - resources and strategies to motivate online socialization processes;
iii. **Information sharing** - orientation for information exchange, interaction among those involved through ICT;
iv. **Knowledge construction** - instructions for building knowledge online;
v. **Development** - discussions, methods to encourage this exchange of knowledge (SALMON, 2000).

From the analysis of such works, it is possible to verify the importance of studying the teaching and learning method through VLE, and it is necessary to provide several trails for the student to construct their walk. Thus, Salmon (2002) explores the need to use the various resources and tools of educational platforms, providing greater interaction between student and object of study. Through this initial research, new strategies can be traced to identify new studies regarding the improvement and optimization of the teaching and learning process, since in addition to being ubiquitous (APARCI, 2017), technologies are constantly evolving. Thus, the need for continuous innovation in its application in education.

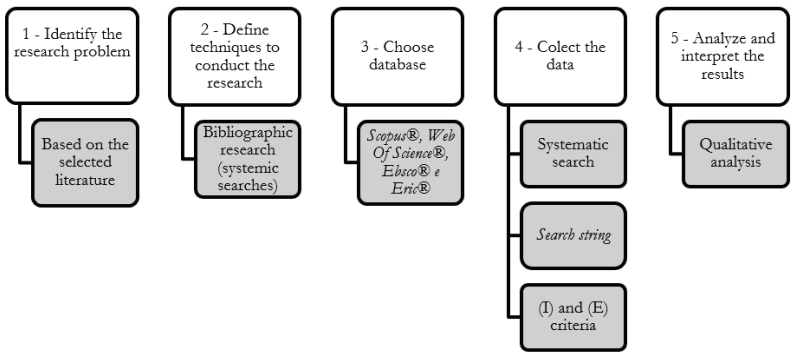
RESEARCH CLASSIFICATION

This theoretical research aims to identify, through qualitative analysis, good practices in Virtual Teaching and Learning Environments, explaining contributions and difficulties in the implementation of such actions, in the process of teaching and learning in academic centers. Thus, the present study had the intention of systematically searching for good practices, measuring their results (contributions) and difficulties encountered in the application of such actions.

RESEARCH PROCEDURE

The scientific method is a set of steps carried out to achieve some scientific objective, previously defined and delimited (SEVERINO, 2007). In this sense, in order to meet the objective and answer the research question that guides this study, the following steps were used as methodological procedures illustrated in figure one (1):

FIGURE1. Research procedure.



Source: Developed by the authors.

After identifying the research problem, the systematic bibliographical research was adopted as a technique for conducting the study. Bibliographical research, implemented by means of reading and analyzing periodicals and books, according to Gil (2010), is developed through material already elaborated, mainly books, scientific articles, magazines, theses, among others.

According to Ferenhof and Fernandes (2016), systematic searches, used as a strategy to solve the problem identified, consist in planning the research method in scientific databases, which synthesize the results collected from the work of other authors. The databases used were Scopus®, Web Of Science®, Ebsco® and Eric®

(Proquest). The criteria used to choose these databases were related to their multidisciplinary, and since they index journals, newspapers and other diverse sources relevant to the research, being considered in this study only reviews and peer-reviewed.

In order to perform the systemic data collection, the following search string was elaborated:

("good practic" OR "best practic*" OR "Good habit*") AND (" virtual environments of teaching-learning" OR "Learning Management System" OR "Virtual Learning Environment ").*

This query was used in the related databases (Scopus®, Web Of Science®, Ebsco® and Eric® (Proquest)) to identify already existing studies on good practices in virtual teaching and learning environments.

Inclusion or exclusion criteria

After completing the search in the listed databases, we adopted as strategy, in order to further delimit the related works, inclusion and exclusion criteria previously defined in a clear and objective way (FERENHOF; FERNANDES, 2016). These criteria were used in two phases:

i. **First phase:** Reading the title, keywords and abstract. In this stage, the objective was to select the articles with the terms "good (best) practices" and "virtual teaching and learning environments (or derivations)" in the title, keywords and (or) abstract, for which they were used the following inclusion criteria (I): (I) Present search strings in the abstract, title or keywords; (I) Adherent to the theme, even if the strings are not included. This criterion was intended to provide greater reliability of content in selected articles.

ii. **Second phase:** Complete reading of articles. In this phase, after completing the selected papers, in the previous phase, the articles for composition of the bibliographic portfolio of the present study were selected. The papers met the following inclusion criteria (I): (I) Complete access to the texts on-line through CAPES, Google Scholar or e-mailed to the authors; (I) Being written in English, Portuguese, (or) Spanish. As exclusion criteria (E), the following delimitations were proposed: (E) Good practices in games or gamification; (E) Presence of the strings, but it is outside the research theme; (E) Not available for full text access online and free.

TABLE 1. Exclusion and inclusion criteria

CRITÉRIOS DE EXCLUSÃO (E)	INCLUSION CRITERIA (I)
(E) Good practices in games or gamification	(I) Complete access to the texts online through CAPES, Google Scholar or e-mailed to the authors
(E) It presents the strings but it is out of the research theme	(I) Display search strings in the abstract, title or keywords
(E) Not available for full text access online and free	(I) Adherent to the theme, even if the strings are not included
(E) Does not display all search strings	(I) Be written in English, Portuguese, (or) Spanish

Source: Developed by the authors.

In order to assist in the planning and execution of the systematic review, the Start-State of the Art through Systematic Review tool was used. This resource is free to use, developed by Software Engineering researchers at the Federal University of São Carlos to contribute to the management of a Systematic Review of Literature.

After defining the selected papers based on exclusion and inclusion criteria, a qualitative analysis was carried out to identify good practices in VLE, their contribution to the teaching and learning process, the difficulties evidenced in their implementation and possible solutions. The qualitative analysis allows the perception of many information that can not be quantified, corresponding to a deeper space of the processes, exploring and describing the specificity of a given problem (FREIRE, 2013).

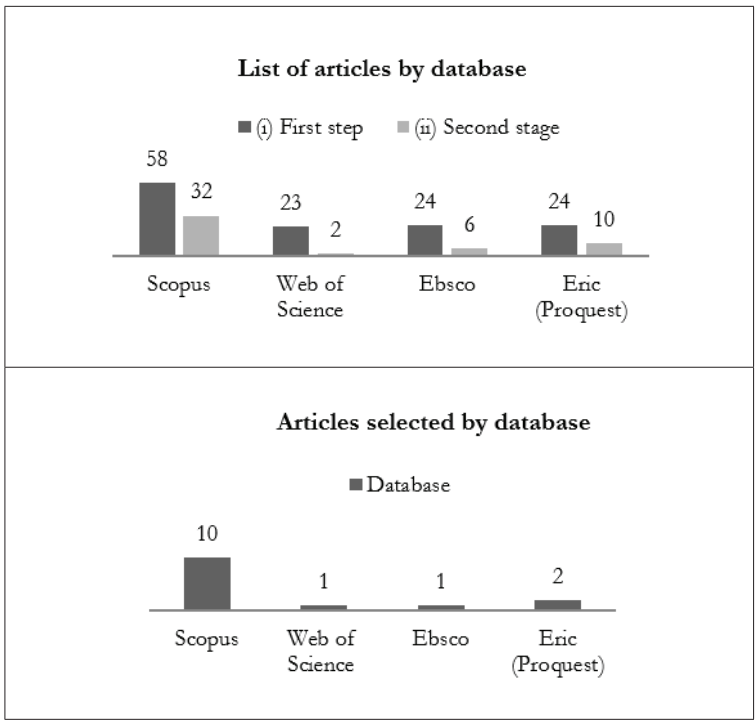
GOOD PRACTICES IN VIRTUAL TEACHING AND LEARNING ENVIRONMENTS

This section presents the results of the research after conducting systematic searches. This method allowed the construction of a bibliographic portfolio with the documents considered more adherent to the objective of this study. After the qualitative analysis of the selected articles, it is possible to identify good practice models for use of VLE and to report on the scenario in which they were applied, thus confirming their contribution to the process of knowledge construction. In addition to these results, the research also verified the obstacles found by academic centers in the execution of such practices, and indicated, based on the literature, some answers to soften, to remedy such obstacles.

STUDY SELECTION

Systematic searches occurred on August 31, 2018, in the following databases: Scopus®, Web Of Science®, Ebsco® and Eric® (Proquest). The method applied for the identification of review or peer review articles returned 129 documents. Of this amount, 32 were duplicates, leaving 97 to begin the first phase of the review. After reading the abstracts, titles and keywords, 50 documents were selected for full reading (second stage): 32 from Scopus®, two (2) fromWeb of Science®, six (6) from Ebsco® and ten (10) from Eric ® (Proquest). From the full analysis of the articles, fourteen (14) documents were considered relevant for this study, as shown in Graph one (1).

GRAPH 1. List of selected articles and database



Source: Developed by the authors.

The description of the articles selected for this research with authors, study title and year of publication allowed the elaboration of the bibliographic portfolio of this document, according to table two (02):

TABLE 2. Bibliographical portfolio

AUTHOR	YEAR	TITLE
Laflen, A. and Smith, M.	2017	Responding to student writing on-line: Tracking student interactions with instructor feedback in a Learning Management System
Stockleben, B. et al.	2017	Towards a framework for creative on-line collaboration: A research on challenges and context
Linder, K. E. et al.	2017	Hybrid Platforms, Tools, and Resources
Merillat, L. and Scheibmeir, M.	2016	Developing a quality improvement process to optimize faculty success
Power, J. and Kannara, V.	2016	Best-practice model for technology enhanced learning in the creative arts
Robb, M. and Fisher, M.	2015	Functionality tools: Time management approaches for facilitating an on-line course in Moodle
Tuffley, D. and Antonio, A.	2015	Enhancing educational opportunities with computer-mediated assessment feedback
Lai, A. and Savage, P.	2013	Learning Management Systems and Principles of Good Teaching: Instructor and Student Perspectives
Logan, L.	2012	Replicating Interactive Graduate Student Writing Workshops in the Virtual Classroom: Best Practices for Meeting Learning Objectives and Controlling Costs
Lopez, G. and Eldridge, S.	2010	A working prototype to promote the creation and control of knowledge in supply chains
Uys, P. M.	2010	Implementing an open source learning management system: A critical analysis of change strategies
Peachey, P. Jones, P. and Jones, A.	2006	Encouraging Student Participation in an On-line Course Using Pull" Initiatives"
Richardson, D. and Watts, B.	2005	Re experiences of using a VLE with a concentrated class
Pavey, J. and Garland, S. W.	2004	The integration and implementation of a range of 'e-activities' to enhance students' interaction and learning

Source: Developed by the authors.

From the reading of the articles, it is possible to identify good practices in VLE used by higher education institutions, their contributions and difficulties, as described in the course of this research.

SCENARIO OF GOOD PRACTICES IN VLE - RESULTS AND CONTRIBUTIONS

From the analysis of the articles selected in the bibliographic portfolio that composes this study, it is possible to identify some good

practices applied in VLE as a strategy to improve teaching and learning by higher education institutions. These practices include different visions, but with similar objectives linked to greater effectiveness and efficiency in the use of VLE for mediation of the teaching and learning process.

TABLE 3. Relationship between VLE and good practice

AUTHOR	VLE	APPLIED THEME - GOOD PRACTICES
Pavey and Garland (2004)	*Blackboard*	Good practices for interaction in VLE.
Laflen and Smith (2017)	*Sakai*	Good practices for feedback.
Lai and Savage (2013)	*Desire2Learn, Moodle Blackboard and WebCT*	Use of resources and tools based on the seven principles of Chickering and Gamson (1987).
Robb and Fisher (2015)	*Moodle*	Good practices in time management through VLE resources and tools based on the seven principles of Chickering and Gamson (1987).
Logan (2012)	*Moodle, Skype and WiZiQ*	Good practices for innovation when applied to the teaching and learning method mediated by ICT.
Lopez and Eldridge (2010)	System *K-Best*	Dissemination of best practices through ICT.
Peachey, Jones and Jones (2006)	*Blackboard*	Good practices to encourage participation in the forum.
Power and Kannara (2016)	Not identified	Redesign and update of VLE recommending best practices.
Richardson (2005)	*WebCT and Blackboard*	Good practices for use of VLE.
Stockleben et al. (2017)	*Moodle*	Good practices for online collaboration feedback and support for the environment and technology tools.
Tuffley and Antonio (2015)	Not identified	Good practices for mediation of feedback through VLE.
Uys (2010)	*Sakai*	Best practices in the application of educational technology.
Linder, Bruenjes and Smith (2017)	*Blackboard, Sakai, Desire2Learn and Moodle*	Recommendations for Best Practices in Learning Management Systems and Open Educational Resources.
Merillat and Scheibmeir (2016)	*Blackboard, My Faculty Center.*	Good practices for teacher training - PDCA.

Source: Developed by the authors.

Pavey and Garland (2004) highlight in their research the implementation of e-activities,[1] highlighting this method as a good practice in VLE. These activities were proposed by Salmon (2002), and aim to provide greater interaction between student and object of study the in use of several tools of the educational platforms. Thus, Pavey and Garland (2004) analyzed the application of training questionnaires, interactive pages and animations, discussion topics and on-line lectures, through the educational platform Blackboard. As a result, it is emphasized that such methods encourage students to interact more effectively in VLE, and the importance of prior planning of applied activities is evident in order to make the communication process more efficient and effective (PAVEY; GARLAND, 2004).

In order to encourage the interaction and mediation of the teaching and learning process in such virtual environments, Laflen and Smith (2017) carried out studies to optimize the feedback process, using as a strategy the successful practices in their research. In the case study carried out, the authors list as good practices: peer evaluation activities; delimitation of time for feedback; and individual meetings (online). According to Laflen and Smith (2017), the research aimed to analyze the rate of access to feedback and the impact of making the note available in the same annex as the comments of the activities, or separately. As a result, a decrease in feedback access numbers was identified when the score was made available in isolation.

Based on the need to use VLE resources and tools in the teaching and learning process efficiently and effectively, Lai and Savage (2013) have as their main focus their research the "Seven Principles of Good Practice in Higher Education" from Chickering and Gamson (1987). Through interviews, focus groups and fieldwork, deficiencies and contributions of the use of VLE were identified, with students being more likely to communicate in person, since discussions among the students, through open questions, did not encouraged interaction and collaboration in discussion forums (LAI; SAVAGE, 2013).

As contributions from the use of VLE in the teaching and learning process, Lai and Savage (2013) relate the following principles of Chickering and Gamson (1987), supported by educational platforms: Immediate feedback, pre-structured through online questionnaires - according to some survey participants, online feedback may be more important than waiting for the considerations in person with the teacher; Emphasize the time available to perform the task - through the VLE tools and resources; Respect diverse forms of learning - support of diverse medias in the educational platforms. In this context, and according to Lai and Savage (2013), the need for new research regarding the integration of ICT in the academic context is emphasized.

Research by Robb and Fisher (2015) also addresses the seven principles of Chickering and Gamson (1987) applied in an online nursing course. The authors point out studies of the item corresponding to time management, based on the resources and tools of the VLE Moodle. In their perceptions, Robb and Fisher (2015) report that a lack of teacher knowledge about the capabilities of educational platforms can compromise the quality of online courses. The use of ICT can improve the productivity of teachers, while supporting the principles of good practice. According to this statement, Robb and Fisher (2015) group the resources of VLE into activities, evaluation and communication tools. Activity tools encourage active engagement that supports various forms of learning. On the other hand, evaluation tools provide immediate feedback, and communication tools highlight time on task and communicate high expectations (ROBB; FISHER, 2015).

Thus, teaching through digital educational platforms requires efficient time management, and organizational skills of educators. The use of activity, assessment and communication tools available in an VLE can serve as a useful time management approach, which reflects on best practices (ROBB; FISHER, 2015), and requires the effective use of ICT in class.

In this sense, in order to make the process of teaching and learning mediated by ICT efficient, Merillat and Scheibmeir (2016) suggest as a good practice, the elaboration of a continuous improvement project (PDCA), which aims at teacher training. In this project, in addition to the Blackboard platform, the "My Faculty Center" resource center, implemented by the own institution, was used. The purpose of this project was to qualify teachers regarding the use of VLE tools and management of the teaching and learning process.

The structuring of the systematic PDCA process - Planning, Developing, Controlling and Acting -, as an initial step, created metrics to assess the basic skills of those involved (P). From this step, generate training opportunities for the teaching staff (D). Then relate the data from the initial assessment to the assessments made by the students (C). The results of the analyzes were integrated into the teacher enrichment program (A) to improve their performance regarding the use of ICT and student satisfaction. The results of such research highlight the importance of teacher improvement in the use of the various VLE tools, since the repeated use of a single tool does not guarantee effective mediation of the teaching and learning process (MERILLAT; SCHEIBMEIR, 2016).

Logan (2012) proposes the use of synchronous communication tools (Skype) to improve online collaborative writing, and best practices

for planning, designing, design, develop and implement online workshops. The study adopted the ADDIE1 (instructional designer) model in workshops, highlighting the importance of combining Moodle, Skype and WiZiQ2 resources, for greater interaction between the student and the study environment (LOGAN, 2012). As a result of this proposal, it is recommended as good practices, besides technical specifications (equipment): the use of ICT facilitating and encouraging interactivity asynchronously; training of the team and academics involved; continuous professional support; use of feedback mechanisms; and also interaction and integration in a synchronous way, between students/students and students/teachers (LOGAN, 2012).

In addition to such best practices, Lopez and Eldridge (2010) point out as a strategy to improve the dissemination of best practices among professionals the application of knowledge management. The scenario addressed in the research was the supply chain, but the authors emphasize that such a strategy can also be applied to the educational context. This study was carried out through the implementation of the following modules in the Knowledge-Based Expert Toolkit (K-Best) system: collaboration, exploration, lessons learned, monitoring and diagnosis. According to Lopez and Eldridge (2010), information on best practices is a difficult issue to explore, since there are few structures for applying them. In addition to innovation in technical matters, changes in the culture and attitudes of educational institutions higher.

One issue that impacts on the culture of innovation in educational institutions, as described by Power and Kannara (2016) is the constant updating and redesign of courses through ICT. Thus, from this gap, Power and Kannara (2016) recommend best practices for the redesign of courses in VLE. The research aimed to encourage the combined learning model, taking into account aspects related to human intervention, learning design and pedagogical contribution. To that end, Power and Kannara (2016) ask questions ranging from teacher encouragement and support regarding the use of such educational platforms and the expectations of academics regarding the organization and content of the virtual platform. After such queries, three barriers are identified in the use of VLE: lack of flexibility in relation to navigation and interface; time in resource development; level of competence of teachers/supervisors/instructors (POWER; KANNARA, 2016).

Thus, it was identified that the tools and collaborative resources and some advanced resources of the educational platforms were not used by the teachers, interfering in a negative way in the process of

teaching and learning. In order to reverse such data, according to Power and Kannara (2016), some modifications were necessary, being they, besides the integration of ICT by the teaching intuitions and its constant updating to a greater incentive to actively learning, changes in the external environment (including policy changes) and course curriculum (areas of knowledge due to technological advancement). After the redesign of the VLE, a positive student evaluation was found on the impact of the updated structure in the knowledge construction process (POWER; KANNARA, 2016).

Richardson and Watts (2005) used the digital platform WebCT[2] in a computer course to analyze the perspectives and comments of the tutors on such platform, their evaluation (virtual environment) and academic performance. As a result, the authors made some technical system recommendations, professional skills, assessments and course development. From reading the recommendations listed by Richardson and Watts (2005), they are relevant to this research: the development of the course should be open to the consultation and suggestions of the team; conducting studies on the best way of structuring courses through VLE; training of the actors involved in the development and implementation of such environments, in order to support the different teaching and learning styles.

From these recommendations, the authors evidence an increasing need for flexible approaches in the process of knowledge construction. According to Richardson and Watts (2005), using VLE, academics, in addition to being able to access digital content at any time of day, benefit from evaluation with pre-structured or individual feedback, since self-tests and quizzes improve academic learning and verification of your progress. Thus, according to results outsourced by Richardson and Watts (2005), the WebCT platform assists the tutor with the possibility of automated feedback, which is a significant benefit, as well as being able to mediate student performance with each completed module or cycle.

Based on the importance of feedback mechanisms in VLE, Tuffley and Antonio (2015) verify whether feedback can be automated through such platforms, and address the need for quality feedback, since it does not meet the expectations of students. According to Tuffley and Antonio (2015), a good return or return must: have predefined and clear evaluation criteria; possibilitate self-evaluation in relation to the expectations of the proposed task; provide performance information; stimulate discussion and questioning of academics; generate motivation and self-esteem; continuous

improvement in academic performance. The result of the use of such mechanisms in educational platforms has demonstrated that they have a strong potential, being a tool that allows learning to learn.

In order to mediate the process of teaching and learning using ICT as an effective tool, Peachey, Jones and Jones (2006) conducted a research between a university and partner colleges of a distance learning entrepreneurship course. This study aimed to identify items that favored student participation in discussion forums. For this, the tutor in addition to additional forums, elaborated and made available through the platform Blackboard, games and questionnaires related to the content addressed in class. In addition to these resources, the institution adhered to the following strategies: development of an informal and comfortable environment; building an online community; greater interaction of the student through games and questionnaires; granting of high levels of encouragement; application of one social element per module; and use of animations in synchronous and asynchronous communications processes. Based on such actions, the institution has adopted the following good practice guidelines: log on regularly and; feedback. Such research has shown that the application of questionnaires and games contribute to greater participation in the discussion forums (PEACHEY; JONES; JONES, 2006).

Also regarding the participation in discussion forums, it was observed the incentive to the sharing of information, and the teaching and the learning of collaborative form. This model was the focus of studies by Stockleben et al. (2017), who joined as a tool of this process the use of VLE. The authors have developed some good practices for online collaboration, through feedback mechanisms and support to the educational platform as well as ICT tools. Practices include: peer review to exchange knowledge; elaboration of open blogs; use of Moodle tools as the "glossary" and to establish a shared vocabulary between teams and; use of Wikis. In addition to such resources Stockleben et al. (2017), highlight other tools for online collaboration as exclusive tasks (participation of students in the choice of material, such as number of tanned on Facebook), unique in creative processes. According to Stockleben et al. (2017), there is a growing need for new ways of learning in a collaborative way, indicating as attenuating the culture in open and peer learning and teaching.

Thus, seeking a new culture that encourages innovation in the academy's methods and processes, Uys (2010) reports the implementation of the VLE Sakai[3] for academic innovation. The study addresses two strategies adhered to support changes in the institution's

culture: the creation of learning communities and; the sharing of best practices in the application of educational technology. During the process of change, three fundamental parameters emerged: building learning communities; the incentive to applied research; and sharing of best practices. According to the authors, the sharing of best practices addresses the performance of online learning projects shows. This initial practice obtained negative results since there were delays in the process of peer review, due to the lack of reward structure for the accomplishment of the activity. As a strategy, the development of manuals for interaction with the Sakai environment and the use of wikis and discussion forums (UYS, 2010) are indicated.

From this context, as a result of the research, one can identify (in a summarized way) the following good practices:

TABLE 4. Good practices for the use of VLE

GOOD PRACTICES	AUTHORS
The VLE should provide structured and immediate feedback;	Robb and Fisher, 2015; Tuffley and Antonio, 2015; Laflen and Smith, 2017.
The proposed activities should influence learning in a collaborative way;	Stockleben et al., 2017; Logan, 2012; Peachey, Jones and Jones, 2006.
Organization of resources in order to encourage interaction among the actors involved with VLE;	Pavey and Garland, 2004; Uys, 2010; Stockleben et al., 2017; Merillat and Scheibmeir, 2016.
Redesign of the structure of VLE encouraging innovation as to the method of organization of the same;	Lai and Savage, 2013; Power and Kannara, 2016; Linder, Bruenjes and Smith, 2017.
Optimization of the elaboration and application of the activities through the tools of the VLE based on the time management;	Robb and Fisher, 2015; Lai and Savage, 2013; Tuffley and Antonio, 2015; Laflen and Smith, 2017; Richardson, 2005.
Early planning, good organizational skills, greater attention to detail and better written communication skills;	Logan, 2012; Lopez; Eldridge, 2010; Merillat; Scheibmeir, 2016.

Source: Developed by the authors.

Good practices for the use of VLE. The analysis of the articles selected in this study also revealed several difficulties faced by educational institutions in order to effectively use the resources and tools of the VLE. However, in addition to the obstacles faced, from the studied studies, it is possible to identify possible solutions, as described below.

DIFFICULTIES AND SOLUTIONS

Aiming to improve, make more effective the teaching and learning process through ICT and research on the method of using VLE, has been the subject of many studies. The focus of this research, besides identifying methods of improvement regarding the use of VLE by means of good practices, allowed the identification of obstacles informed by the authors, and possible solutions based on the works linked in this analysis.

Difficulties:

- Effectively use VLE's resources and tools, not as a mere repository of information;
- Interaction between students and educational platforms;
- Encouragement method for greater interaction between teacher and student, through virtual environments;
- Implementation of practices for online collaboration;

Possible solutions:

- Teacher training in VLE;
- Development of instructions, or guides of functionality of the VLE tools for students and teachers;
- Guidelines for online collaboration;
- Previous planning regarding the use of ICT resources;
- Interdisciplinary approaches, including new proposals, methods applied to VLE;
- Standardization of good practices in VLE;

As identified by Robb and Fisher (2015), VLE still have some gaps related to time management and learning. Often, the tool provided by the virtual platform is not being used effectively, causing in some disorders for both teachers and students, resulting in wasted time spent in activities, which could often be automated in such platforms. This question is related to the level of teacher and student knowledge regarding the ICT resources used by the educational institution, and actions are needed to improve the actors involved in the use of such tools.

Thus, in the researches of Logan (2012), it is suggested as possible solutions to soften this gap: elaboration of best practices; teacher training; management of students' abilities, regarding the use of technological resources; instructions, or feature guides of VLE

tools; and development of the course or discipline aiming to improve the digital skills of the actors involved. Logan (2012) emphasizes that only from digitally competent teachers, it is possible to encourage the construction of knowledge mediated by ICT.

According to Lai and Savage (2013), the lack of competence regarding the use of the resources and tools of VLE has led to deficiencies in the following principles of Chickering and Gamson (1987): *(i) Efficiency in student motivation to obtain greater interaction with the teacher; (ii) Encourage reciprocity and cooperation among students; (iii) Encourage active learning; (iv) Communicate high expectations*. The lack evidenced in such principles relates to failure in the processes of collaboration and interaction, through such virtual environments. From this perception, one can identify that the limitations in VLE are linked to the applied online collaboration method, since all the items relate to such processes.

In this context, Stockleben et al. (2017) evidences the need for new research, listing guidelines for online collaboration. According to Pavey and Garland (2004), the realization of several activities for shared learning, provide several learning opportunities allowing to involve the students according to their style of learning. Thus, in order to encourage collaborative and interactive processes mediated by VLE, Linder, Bruenjes and Smith (2017) list the following necessary actions: anticipated planning of dynamics and activities; enhancement of communication skills in the form of writing; adherence to new interdisciplinary approaches applied to the academic context. These previously planned actions encourage and innovate the process of teaching and learning, driven by Stockleben et al. (2017) for the innovation and creativity of those involved, thus emerging professionals with greater qualification, according to the new demand in the market.

The results obtained in this research identified good practices for effective use of VLE in the process of constructing student knowledge, their contributions, difficulties and possible solutions for their effective implementation. Thus, based on such evidenced actions, the need arises to elaborate, apply and validate a structure (model), through the unification of such items (good practices), noting their contribution in the process of mediation of complex processes such as the elaboration of academic work, addressing as a focus, models of collaboration and interaction between student/student and student/object of study.

FINAL CONSIDERATIONS

This article presented a systematic review in the literature on best practices in Virtual Teaching and Learning Environments. According to APO (2009), a best practice is any activity that works best to contribute to a given situation. Thus, through the in-depth study of selected articles, the study presented good practices applied in VLE, presented the scenario in which they were applied and measured how they can contribute to the mediation of the teaching and learning process. In addition to the contribution of such actions, the research also found difficulties encountered by higher education institutions regarding the use of these technologies and possible solutions (through good practices) to soften such obstacles.

In their research, Dahlstrom, Brookse and Bichsel (2014) already highlighted the imminent need for studies on the method, the best use of VLE resources and tools in the academic context. In this bias, some of the practices listed include, in addition to the anticipated planning regarding the use of ICT, the use of diverse resources and tools of the digital platforms, attending diverse styles of learning, use of mechanisms of feedback, peer evaluation, redesign of course in virtual environments, use of collaborative tools, among other practices recommended in this research.

According to Chickering and Gamson (1987), Salmon (2000) Pavey and Garland (2004) it is necessary to influence good practices by encouraging planning, prioritization, standard structures and revision, ways to guide students on efficient use of technologies and interaction with the environment, allowing greater mediation of learning. Thus, the availability of new teaching and learning opportunities becomes paramount, aiming to involve students according to the different styles of cognitive construction (PAVEY; GARLAND, 2004). In this process, the use of tools for collaborative learning and the relevance of teacher orientation (mediation) are encouraged, encouraging the construction of knowledge through the use of such technologies. The study on the use of ICT resources according to Stockleben et al. (2017), potentiates the construction of knowledge, enabling the identification of new teaching strategies by combining different areas, innovating and learning to learn.

In addition to the contributions and results of the good practices addressed, there are some obstacles to its implementation, such as the lack of teacher training and the need for a standard structure with the unification of these practices. The latent need for teacher improvement

reflects on related concepts, as well as possible issues linked to digital literacy and the digital skills required for the current teacher who embraces the integration of ICT in the academic setting. According to Dahlstrom, Brooks and Bichsel (2014), even with the omnipresence of ICTs that induce perceptions related to the domain of current digital technologies, since they use them (digital literacy), there is a big gap in the level of ICT knowledge. This issue can significantly interfere in the mediation process, through VLE, and a deeper understanding of the method of managing such skills is needed.

Another difficulty is related to the need for a standard model, a prototype for the implementation of good practices. This issue becomes of extreme relevance, since the union of best practices in the same virtual environment enhances the process of teaching learning, allowing greater interaction and mediation with the object of study, considering the interference of the environment. Thus, based on these difficulties, and approaching possible solutions identified in the literature, it is pertinent to elaborate a model with recommendations of best practices that include from the actions cited in this research, the elaboration of instructions, or guides of functionality of the tools of the VLE for students and teachers; guidelines for online collaboration; interdisciplinary approaches including new proposals and new management practices of VLE.

Based on the study, it can be observed that research on best practices in the context of higher education is not a relatively new theme, highlighting the studies of Chickering and Gamson (1987). Due to the constant evolution and integration of ICT in the educational scenario, continuous research is needed to optimize the method of using such resources in processes in which technological mediation is considered complex, such as the elaboration of academic works, the use of these platforms. This conception is emphasized, since the student, through the tools and resources of ICT, becomes increasingly autonomous and independent in the teaching and learning process, being a differential for the teacher to potentiate such a walk through the use of form of these technologies in the mediation of the process of knowledge construction.

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NOTES

1 Online activities that enhance mediation, collaboration and interaction among the actors involved. The e-activities are defined by Salmon (2002) as predefined structures to provide online teaching and learning in an active and interactive way, characterized by: motivation, interaction, practices carried out by a moderator, asynchronous and low communication cost (SALMON, 2002).

2 It is a virtual learning environment system licensed to colleges and other institutions. For WebCT courses, instructors can add tools such as discussion forums, email systems and live chat, along with content, including documents and web pages. Source: https://www.elearninglearning.com/webct/

3 Virtual, "open" platform that provides a set of resources for higher education to meet the dynamic needs of a global academic community. Source: https://www.sakaiproject.org/about

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