



Analysis of Flipped Classroom Methodology in Students: A Systematic Review

Luz Mirian Ruiz Becerra^{1*}

¹Postgraduate School, César Vallejo University, Peru.

Author's contribution

The sole author designed, analysed, interpreted and prepared the manuscript.

Article Information

DOI: 10.9734/AJESS/2021/v19i130454

Editor(s):

(1) Dr. Ana Sofia Pedrosa Gomes dos Santos, Universidade de Lisboa, Portugal.

Reviewers:

(1) Abdurrahman Abdurrahman, Universitas Lampung, Indonesia.

(2) Luz Marina Forero Contreras, Colegio Los Nogales, Colombia.

Complete Peer review History: <http://www.sdiarticle4.com/review-history/70320>

Received 16 April 2021

Accepted 26 June 2021

Published 02 July 2021

Systematic Review Article

ABSTRACT

This review article aimed to analyze scientific production of the invested classroom methodology in students from 2017 to 2020, under a bibliographic methodology, as a technique it used the documentary analysis of databases like Ebscohost, Scopus, Eric, Science Direct and Scielo whose sample was 17 articles plus 25 to 30 scientific articles corresponding to years 2017 to 2020. On the other hand, Boolean connectors such as and/or were used, as well as quotes for a more specific search. The prism diagram was used, reaching conclusion on the analysis of selected scientific articles, it is concluded the flipped classroom is a methodology favors the change from traditional teaching process to an interactive teaching-learning process, where it is reinforced with use of technology that attracts attention of students through development of attractive activities promote meaningful learning for student.

Keywords: Flipped classroom; blended learning; educational technology.

1. INTRODUCTION

Today, innovative practices within education are important, such is the case technology has been included in academic studies, that is, technology

has been combined with the classroom, which is also called hybrid teaching or blended Learning, which allows students to access online before going to classroom [1]. The methodology of flipped classroom contributes to modernize

*Corresponding author: Email: lruizbe1189@ucvvirtual.edu.pe;

educational activities in a comprehensive way [2] because internet resources are available and include audio and video, so flipped classroom can host different curricular experiences and topics that support development of technical communication skills for building learning in students [3].

In China, flipped classroom is causing a growing concern as English teachers at university level argue this new teaching method is not working as expected, given teachers do not adapt easily to it, but prefer traditional classroom, where knowledge and information are taught under monitoring of a teacher, receiving knowledge directly, as specified [4]. Calderón [5], determined the students through flipped classroom are predisposed and motivated to connect to Facebook and review the material the teacher uploads, in the same way managed to identify their learning styles and multiple intelligence they possess, in the same way it allows them to improve their autonomy for learning, on the other hand, teacher has more time to dedicate to his students, maintaining a direct and fluid communication with them.

Flipped Classroom method is increased as one of teaching methodologies with great projection for its implementation in higher education stage. This method based on Information and Communication Technologies allows active learning of student body [6]. The purpose of flipped classrooms is to attract the students' attention through attractive, understandable activities allow meaningful learning [7]. Thus, the objective of this research is to analyze scientific production of methodology of flipped classroom in students from 2017 to 2020.

2. METHODOLOGY

Documentary analysis was used. The sample consisted of 17 scientific articles corresponding to 2017-2021 period. It began with a search for keywords and synonyms in scientific dictionaries such as Unesco Thesaurus and in the ERIC thesaurus where the related keywords correspond to educational innovation, pedagogical practice, Blended Learning, Educational technology and Homework.

Databases considered were: Ebscohost is a platform that belongs to EBSCO Publishing, followed by Scopus which is a bibliographic database belonging to Elsevier company, then Eric database, is a broad specialist database in

education where various articles are grouped online, in the same way Science Direct which is a wide platform that provides access to various scientific articles and finally Scielo which is a library virtual houses diverse academic and scientific information online, where we made use of boolean operators that are called logical operators and are keywords or symbols that logically connect terms, concepts or grouping of terms to expand, limit and define the bibliographic search in a simple, fast and efficient way; in the present study, the and also called "y" was also used the or connector through "o" to facilitate the search for scientific articles.

3. RESULTS

From overall eric search 1058 articles were recorded, however, when peer review was activated for greater accuracy, this figure was reduced to 946 results. In that sense, the analysis of the scientific production on the methodology of flipped classroom in students considering 2017 to 2020 period, according Scopus database it was found that: Bates & Ludwig [8] propose flipped classroom favors a more active class environment since it allows students to arrive more prepared and familiar with subject of study before starting the class. For his part, Wang [9] points out secondary school teachers in Hong Kong perceived various inhibiting factors in implementing flipped classroom teaching, with internal barriers or challenges being attitude, beliefs and confidence and external time, resources and support. Chung & Foon [10] suggest flipped classroom is not a panacea for all problems in education, but it does promote active learning for students, through use of videos and virtual platforms. Lee & Lai [11] report that according results of survey students feel they can use knowledge and skill imparted by teachers; success of flipped classroom is an undeniable fact. Zarouk et al. [12] point out implementation of technology in the pedagogical process has required that teaching-learning processes be modified by integrating technologies in order to promote attractive learning with the PBL in educational practices focused on students. For their part, Al-Samarraie et al. [13] argue flipped classroom model in higher education has generated significant changes affecting teaching and learning practices, promoting student engagement, metacognition, performance, understanding, achievement. Fisher et al. [14] indicate flipped learning involves students and contributes to achievement of desired outcomes. In that order,

Gwo-Jen et al. [15] point out flipped learning focuses on new era, making use of innovative strategies and technologies facilitate outcomes of flipped learning in relation to traditional learning. Akcayr & Akcayr [16] report flipped classroom counteracted problem students had inadequate preparation before class, so it actively demonstrated better results. Likewise, Van et al. [17] show 95% of included flipped interventions made use of instructional activities they based on videos.

Similarly, according to Ebscohost database it was found that, Baltimore [18] notes Flipster makes it easier for users to navigate between a variety of journals, EBSCO host Collection Manager (ECM) makes it easier for Hammond to manage Flipster's subscriptions from library. On the other hand, results found in ERIC database were found to be; Rabidoux and Rottmann [19] propose the various technological resources will help higher education instructors effectively implement flipped classrooms, there is a need for more empirical evidence to validate implementation of flipped classrooms in higher education. Zhang and Feng [20] suggest that in research process and experimentation and promotion of teaching mode that combines microlections and flipped classroom, an evaluation system should be developed to evaluate teaching process of an flipped classroom, improving professional capacity and performance of students, which cannot be evaluated by traditional methods of evaluation methods. In turn, Fatimah and Heng-Yu [21] report faculty participants who fully implemented flipped model had positive opinions about student implementation and participation, finding the model helped increase student performance and grades; in addition, most of participating students liked the challenges offered by the flipped classroom, which increased their participation. Zhu and Xie [22] suggest two types of flipped classroom approaches may produce better instructional effects relative to traditional teaching method; the semi-flipped classroom approach is better suited for liberal arts specialties in college compared to full classroom approach; flipped classroom only achieves its educational effects after a period of time. For their part, Kazu and Kurtoglu [23] conclude students who perceive themselves competent in the use of technological devices are more ready for flipped classroom than their peers who think they only have a medium proficiency or who define themselves by being insufficiently competent. Flipped classroom is described as a

teaching process takes place at home and requires use of the Internet, and that reinforces students' self-directed learning with activities such as discussions, peer-to-peer or group activities in class. In order for students to make progress, they must be able to make efficient use of technological devices and it is expected that students who are proficient in the use of technology are more ready for flipped classroom. For their part, Julia et al. [24] raised seven problems, which can be answered as follows. First, publications about flipped classroom in Scopus, indexed journals have continued to increase in number over the past ten years.

From search results in Science Direct database it was found that; Martinez and Ruiz [25] argue implementation of this new methodology entails another challenge: teachers must move away from their traditional role, reducing explanations. They have to increase collaborative projects, planning and preparing different activities such as role-playing games, debates, collaborative and cooperative activities, etc. They should be motivated to do because it takes a lot of time prepare such activities and plan class time, evaluate them, etc. In turn, Meng, Yu and Hsueh [26] point out that a study targeted civics courses and has implemented teaching experiment in an flipped classroom approach of brainstorming in a 6-week course, additional should investigate long-term effect of flipped classroom in other subjects and collect self-learning profiles for students, to discuss relationship between student learning behaviors, flipped classroom and learning performance. On the other hand, from results obtained from Scielo database it was found that; Hernandez et al. [27] demonstrated students recognized convenience and pedagogical benefits of flipped classroom approach. In addition, they expressed a high preference for this approach in relation to traditional teacher-led model. This allowed them reflect in two perspectives, on the one hand, as students on commitment to their own learning and the need to develop it in a group and autonomous way and as future teachers, on importance of modernizing pedagogical practices with innovative models. Finally, Escudero and Mercado [28] point out that other methods abound to address flipped classroom, such as mixed ones that combine the application of surveys and focus groups. The latter have focused mainly on knowing opinions and self-perceptions of students and teachers about experience of having participated for first time in a flipped classroom; however, it is essential to

design a model of flipped classroom assessment. This involves examining large volumes of data students generate in their educational practice. It is not enough knowing their opinions about flipped classroom.

4. DISCUSSION

The scientific production of methodology of flipped classroom in students from 2017 to 2020 period was analyzed. Thus, Bordes et al. [2] referred the methodology of flipped classroom contributes to modernize educational activities in a comprehensive way. Bates & Ludwig [8] concluded flipped classroom favors a more active class environment since it allows students to arrive more prepared and familiar with subject of study before starting class.

Likewise, flipped classroom method, is increased as one of teaching methodologies with great projection for its implementation in the stage of higher education. This method based on Information and Communication Technologies allows active learning of student body [6] which is also reinforced with study carried out by [12] who concluded that implementation of technology in the pedagogical process has required teaching-learning processes be modified integrating technologies in order to promote an attractive learning with the PBL in educational practices focused on students.

According to Fonseca and Melo [7], flipped classrooms are intended to attract attention of students through attractive, understandable activities allow meaningful learning, this is supported by [10] who concluded flipped classroom is not a panacea for all problems in education but if it promotes active learning for students, through use of videos and virtual platforms; in the same way, [29] concluded flipped classroom model allows set presentation and delivery dates for teachers and students, providing teacher with classes a week in advance so teacher can review and study prior to class.

5. CONCLUSIONS

Based on analysis of selected scientific articles, it is concluded flipped classroom is a methodology promotes change from traditional teaching process to an interactive teaching-learning process, where it is reinforced with use of technology that allows attract attention of students through development of attractive

activities that promote meaningful learning for student.

COMPETING INTERESTS

Author has declared that no competing interests exist.

REFERENCES

1. De Almeida J, Evangelista Jy, Santos A. Un estudio sobre experiencias de aprendizaje en un modelo de sala de aula invertida. *Revista Práxis*. 2020; 2:103. Available:<https://doi.org/10.25112/rpr.v2i0.2157>
2. Bordes S, Walker D, Modica L, Buckland Jy, Sobering A. Towards the optimal use of video recordings to support the flipped classroom in medical school basic sciences education. *Medical Education Online*. 2021;26(1). Available:<https://doi.org/10.1080/10872981.2020.1841406>
3. Pourmand P, Pudasaini By, Shahandashti M. Assessing the benefits of flipped classroom in enhancing construction students' technical communication skills. *Journal of Civil Engineering Education*. 2020;147(1). Available:<https://www.scopus.com/record/display.uri?eid=2s2.085091114943&origin=resultslist&sort=plff&src=s&st1=flipped+classroom&st2=&sid=cba5c9417980701cc749b620d66b4e7c&sot=b&sdt=b&sl=32&s=TILEABSKEY%28flipped+classroom%29&relpos=4&citeCnt=0&searchTerm=>
4. Suo Jy, Hou X. A study on the motivational strategies in college english flipped classroom. *English Language Teaching*. 2017;10(5):62. Available:<https://doi.org/10.5539/elt.v10n5.p62>
5. Calderón E. Application of the inverted classroom methodology in the English subject for the learning of grammar and vocabulary in 10th-year students of the Mejía National Institute in the City of Quito; 2018. Available:https://iconline.ipleiria.pt/bitstream/10400.8/3414/1/UPTICRelatorioFinal_Elena Calderon 19_06_18.pdf
6. Hinojo FJ, Aznar I, Romero JM & Marín JA. Influence of the inverted classroom on academic performance. A systematic

- review | Fennel Lucena | Virtual Campus. 2019;1.
7. Fonseca Ly, Melo L. The use of the flipped classroom as a teaching strategy for teaching content through English to children in the initial stage of the Conde An­s­u­rez Hispanic-American bilingual school in Bogot­a. In Master in Didactics of Languages; 2019.
Available:https://ciencia.lasalle.edu.co/maest_didactica_lenguas/3
 8. Bates D & Ludwig G. Flipped classroom in a therapeutic modality course: students' perspective. Research And Practice In Technology Enhanced Learning. 2020; 15(1).
Available:<https://doi.org/10.1186/s41039-020-00139-3>
 9. Wang T. Overcoming barriers to 'flip': building teacher's capacity for the adoption of flipped classroom in Hong Kong secondary schools. Research and Practice in Technology Enhanced Learning. 2017; 12(1).
Available:<https://doi.org/10.1186/s41039-017-0047-7>
 10. Chung L, Foon K. A critical review of flipped classroom challenges in K-12 education: possible solutions and recommendations for future research. Research and Practice in Technology Enhanced Learning. 2017;12(1).
Available:<https://doi.org/10.1186/s41039-016-0044-2>
 11. Lee K, Lai Y. Facilitating higher-order thinking with the flipped classroom model: A student teacher's experience in a Hong Kong secondary school. Research and Practice in Technology Enhanced Learning. 2017;12(1).
Available:<https://doi.org/10.1186/s41039-017-0048-6>
 12. Zarouk M, Olivera E, Peres P & Khaldi M. The impact of flipped project-based learning on self-regulation in higher education. International Journal of Emerging Technologies in Learning. 2020;15(17):127-147.
Available:<https://doi.org/10.3991/ijet.v15i17.14135>
 13. Al-Samarraie H, Shamsuddin A & Ibrahim A. A flipped classroom model in higher education: A review of the evidence across disciplines. Educational Technology Research and Development. 2020;68:1017-1051.
Available:<https://doi.org/https://doi.org/10.1007/s11423-019-09718-8>
 14. Fisher R, LaFerriere R.y Rixon A. Flipped learning: An effective pedagogy with an Achilles heel. Innovations in Education and Teaching International. 2019;57(5):543-554.
Available:<https://doi.org/https://doi.org/10.1080/14703297.2019.1635904>
 15. Gwo-Jen H, Chenjiu Y & Hui-Chun C. The era of flipped learning: promoting active learning and higher order thinking with innovative flipped learning strategies and supporting systems. Interactive Learning Environments. 2019;27:991-994.
Available:<https://doi.org/https://doi.org/10.1080/10494820.2019.1667150>
 16. Akcayr G & Akcayr M. The flipped classroom: A review of its advantages and challenges. Computers & Education, 2018;126:334-345.
Available:<https://doi.org/https://doi.org/10.1016/j.compedu.2018.07.021>
 17. Van D, Phielix C, Janssen J & Kester L. Effects of flipping the classroom on learning outcomes and satisfaction: A meta-analysis. Educational Research Review. 2019;28.
Available:<https://doi.org/https://doi.org/10.1016/j.edurev.2019.05.003>
 18. Rabidoux M. Meet the needs of students inside and outside the classroom with Flipster. EBSCO; 2020.
Available:<https://www.ebsco.com/resources/success-story/meeting-students-needs-inside-and-outside-classroom-flipster>
 19. Rabidoux S and Rottmann A. Revisualizing the archaic learning environment of higher education: implementation processes for flipped classrooms. International Journal On E-learning. 2018;17:85-93.
Available:<https://eric.ed.gov/?q=flipped+classroom&pr=on&id=EJ1164379>
 20. Zhang Fy, Feng S. Teaching application of micro-lesson and flipped classroom. In: Education quarterly reviews. Rese­nas Trimestrales De Educaci­on. 2019;2(3):480-486.
Available:<https://doi.org/10.31014/aior.1993.02.03.80>
 21. Fatimah A and Heng-Yu K. Perceptions of student participation in the flipped classroom: A case study. Educational Media International. 2020;57(2):128-147.
Available:<https://eric.ed.gov/?q=flipped+classroom&pr=on&id=EJ1264359>

22. Zhu W and Xie W. Evaluation of the educational effects of the flipped classroom in the university: A case study on the e-business course. *International Journal of Distance Education Technologies*. 2018;16(1):45-55. Available:<https://eric.ed.gov/?q=flipped+classroom&pr=on&id=EJ1161700>
23. Kazu, İbrahim Y, Kurtoğlu C. Research of flipped classroom based on students perceptions. *Revista Asiática De Educación Y Formación*. 2020;6(3):505-513. Available:<https://doi.org/10.20448/journal.522.2020.63.505.513>
24. Julia J, Dolifah D, Afrianti N, Isrokaton I, Kamal S, Erhamwilda E, Supriyadi Ty & Ningrum D. Flipped classroom educational model (2010-2019): A bibliometric study. *European Journal of Educational Research*. 2020;9(4):1377-1392. Available:<https://doi.org/10.12973/eujer.9.4.1377>
25. Martinez R and Ruíz C. Improve student satisfaction and learning performance by using the flipped classroom. *The International Journal of Management Education*. 2020;18(3). Available:<https://www.sciencedirect.com/science/article/pii/S1472811719302022>
26. Meng T, Yu L & Hsueh C. A flipped classroom approach to brainstorming to improve student learning performance, motivation, teacher-student interaction, and creativity in a civics class. *Thinking Skills and Creativity*. 2020; 38. Available:<https://doi.org/https://doi.org/10.1016/j.tsc.2020.100747>
27. Hernández C, Gamboa R & Prada A. Initial teacher education: Active scenarios from a flipped classroom perspective. *University Training*. 2020;13:213-222.
28. Escudero Ay & Mercado P. Use of learning analytics in the flipped classroom: A systematic review. *Apertura*. 2019;11(2): 72-85. Available: <https://doi.org/|e-ISSN2007-1094|UniversidaddeGuadalajarahhttp://dx.doi.org/10.32870/Ap.v11n2.1546>
29. Prieto A, Díaz D, Lara I & Monserrat J. New combinations of reverse classroom with just in time teaching and analysis of student responses TT - New combinations of flipped classroom with just in time teaching' and learning analytics of student responses. *RIED. Ibero-American Journal of Distance Education*. 2018;21(1):175-194. Available: <http://10.0.23.56/ried.21.1.18836>

© 2021 Becerra; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:

*The peer review history for this paper can be accessed here:
<http://www.sdiarticle4.com/review-history/70320>*