

Scientific production in Ecuadorian higher education on learning assessment: Bibliometric study, 2011-2021

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Abstract

This article presents a bibliometric study of the scientific production of learning assessments generated by Ecuadorian universities and their academic actors between 2011 and 2021, based on Google Scholar data. The decision was based on the numerous problems associated with evaluative practice, the lack of bibliometric data on the subject, and its implications and decisions in terms of educational improvement. The research sought to answer seven questions that guided the analysis. A non-experimental quantitative approach was assumed and a bibliographic, exploratory, descriptive and longitudinal study was applied. The bibliometric method and the descriptive-inferential statistics applied made it possible to measure and analyze several bibliometric indicators: authors, their Ecuadorian institutional affiliation, titles, years, citations, sources, types of publication (article or thesis) and keywords. The results show a scarce scientific production, highlighting some illustrative data: of 237 publications analyzed, only 24 articles and 51 theses correspond to Ecuadorian higher education in its different academic actors, representing 32% and 68%, respectively. The average number of citations of only 3.5 in journals, being much lower in theses, denotes a low impact, while these are concentrated in only eight universities. On the other hand, more than 90% of the citations were found in the Latindex database. These results will allow a deep analysis at the level of the university community in Ecuador, allowing to rethink actions in this regard.

Keywords: learning assessment, higher education, bibliometric study, outcome analysis, educational improvement

Resumen

Este artículo presenta un estudio bibliométrico de la producción científica sobre la evaluación del aprendizaje, generada por las universidades ecuatorianas y sus actores académicos, entre los años 2011 y 2021, a partir de la data de Google Scholar. La decisión partió de considerar las numerosas problemáticas asociadas a la práctica evaluativa, la falta de datos bibliométricos al respecto, así como sus implicaciones y decisiones en función de la mejora educativa. Mediante la investigación se buscó dar respuesta a siete interrogantes que guiaron el análisis. Se asumió un enfoque cuantitativo no experimental y aplicó un estudio de tipo bibliográfico, exploratorio, descriptivo y longitudinal. El método bibliométrico y la estadística descriptiva-inferencial que se aplicó permitieron medir y analizar varios indicadores bibliométricos: autores, su afiliación institucional ecuatoriana,

títulos, años, citas, fuentes, tipos de publicación (artículo o tesis) y palabras claves. Los resultados muestran una escasa producción científica destacándose algunos datos ilustrativos: de 237 publicaciones analizadas sólo 24 artículos y 51 tesis corresponden a la educación superior ecuatoriana en sus diferentes actores académicos, lo que representa el 32 % y el 68 % respectivamente. La media de citaciones de tan solo del 3.5 en revistas, siendo mucho menor en las tesis, denota un escaso impacto, mientras que estas se concentran en apenas ocho universidades. Más del 90 % de las citas se encontraron en la base Latindex. Estos resultados permitirán un análisis profundo a nivel de la comunidad universitaria del Ecuador, pudiendo replantear acciones al respecto.

Palabras clave: Evaluación del aprendizaje, educación superior, estudio bibliométrico, análisis de resultados, mejora de la educación

Introduction

Learning assessment is one of the links in the educational teaching process most committed to educational quality, and the assessments made in this regard. However, at the same time, it is one of the most complex, polemic, controversial processes and with the most significant outstanding debts to be solved in daily practice (Borjas, 2014; Hernández, 2017; González, 2001, Panadero et al., 2022).

Numerous works consulted report student dissatisfaction and teacher criticism of the low quality of classroom assessments, starting from their conception to the usual practice: relevance, purpose, design, cognitive level and suitability of the questions asked, among others, revealing the lack of competencies in assessment by many teachers (Ayala et al., 2010; Khalid et al., 2021, Stiggins & Arter, 2002).

Recent publications (Flores et al., 2019; Monzón, 2015; UNESCO, 2020), including some that report concrete experiences and results in virtuality during the pandemic stage (Hernández et al., 2021; Román, 2020; Villarroel et al., 2021) show that in the evaluation of learning in the university context, there is still a firm anchorage in traditional conceptions and practices, evidencing that what deserves to be evaluated is not always evaluated, according to what is truly transcendent for learning, according to the most relevant educational purposes and functions of the evaluation and that must necessarily be prioritized, which evidences a conventional formality.

According to Boud (2020), “Current evaluation is typically a collection of conventional practices that have never been seriously challenged (p.1).” He adds:

Despite some important changes, in most institutions, many issues still need to be addressed in the evaluation. Some of these require further investigation before we can offer confident recommendations for change (p. 8).

In addition, the study by Cano et al. (2020) showed that although the transition to virtuality promoted the use of new technological resources and assessment options, it was clear that, together with the emergence of the pandemic and virtuality, many other factors also added other complexities and new challenges due to the unavailability in many cases of the necessary technological infrastructure in the educational contexts of Latin America. In particular, the digital divide and the scarce pedagogical and technological skills of teachers and students to learn, teach and evaluate effectiveness in virtual or remote conditions became evident, which generated what can be cataloged, in the words of García-Peñalvo (2020) as “the perfect storm” (p.1).

However, in the search carried out prior to this work, no research has been found that provides details in data and metrics on how research activity and scientific production on the subject of evaluation has developed during this or previous stages, particularly in Ecuador, which reveals a weak point in research work (Arias et al., 2022).

This fact brings into focus the need to investigate in greater depth and have more details on the learning assessment carried out by teachers, which would help to analyze better the assessment practice that is carried out, better guide actions and address the current and still latent needs for improvement and thus be able to make adjustments and improvements necessary to enable the implementation of educational and authentic assessments (Merlo et al., 2022).

Librada et al. (2018) supported this purpose of improvement, who have considered that through research and scientific production on learning assessment it is possible to enrich and modify theories, feed back, readjust and readjust and renew teaching practice.

It is understood that, if the necessary scientific information is available in this regard, it will be possible to discover if and to what extent teachers are moving in the same direction of the needs and educational problems that arise, if they are acting in line with the ever-changing dynamics of education and evaluation, to know what issues or aspects of evaluation teachers are focusing on, if they are concerned and if they are taking care of investigating and solving the new problems that arise, if they are critically analyzing and reflecting on their praxis, on their successes, shortcomings and insufficiencies and if they are contributing and to what extent to favor the necessary evaluative transformation, which in turn will help to improve education and society (Flores, Meléndez, et al., 2019; González-Campo et al., 2018).

Understandably, having this type of scientific information would help and will help to make decisions regarding a set of issues of possible revision for educational improvement: adjustments in assessment regulations, methodologies, and systemic planning of teacher training on the subject, among other possibilities. However, prior to this work, the exploration and bibliographic review yielded some striking and contrasting facts concerning the scientific production in Higher Education in Ecuador related to learning assessment.

On the one hand, some of the works consulted (Balladares et al., 2020; Galarza et al., 2020; Rivera et al., 2017) show an interest in increasing scientific production in the country, registering an increase of 5.16 times in the last ten years (2010-2020) according to a 2019 study by the Secretariat of Higher Education, Science, Technology and Innovation (SENESCYT), taken from the blog of the Universidad Técnica Particular de Loja (UTPL, 2020). On the other hand, the study mentioned above reveals that publications in Educational Sciences are much smaller than in other areas of knowledge and particularly scarce in evaluating learning.

Other authors (Cardona-Román & Sánchez-Torres, 2017) also note the low presence of publications in Scopus, Web of Science and SciELO, which are also markedly depressed in the area of humanities, educational sciences and especially in learning assessment.

Likewise, a review of the national report accessible in the UNESCO library (Chiriboga, 2021) showed that Ecuador recognizes the importance of evaluation for the orientation and planning of educational policies and curricular decision-making. However, the recommendations made in the report do not include any request or call for attention to research and scientific production on this topic.

The previous bibliographic review also revealed that few bibliometric studies had been carried out in Ecuadorian Higher Education, with few exceptions. (Morocho, 2018), not finding any published study of this type in the country on learning assessment prevents the availability of important data and details related to scientific production and several metrics of interest.

It should be noted, according to several authors (Gonzalez-Campo et al., 2018; Velasco et al., 2012), that bibliometric studies are essential to measuring scientific production, its impacts, the level of management and the socio-educational contribution of researchers in different topics or areas. These are based on the use and measurement of certain variables, also called indicators, which in the words of Gomez and Bordon (1996), “are statistics deduced from the publications. Furthermore, their use is based on the important role played by publications in disseminating new knowledge, a role assumed at all levels of the scientific process” (p.21).

Although bibliometric studies have indeed been the subject of some controversy among some authors, the absence of these measurements significantly limits the vision, breadth, accuracy and depth of the analyses of educational research and derived publications so that, in general, there is a majority acceptance of them (Rueda-Clausen et al., 2005).

According to other authors (Bordons & Zulueta, 1999; Flores-Fernández & Aguilera-Eguía, 2019; García-Villar & García-Santos, 2021; Velasco et al., 2012), the use of bibliometric indicators is a viable option because it provides objectivity to the studies and allows measurements that can be quantified and verified. Thus, it is possible to know some values with estimable measures of scientific activity (type of work, number of

publications, topics covered, collaboration and level of authorship, among others), the visibility of the publications (impact of the journal through a certain index or impact factor), number of citations of the work, distribution in databases and indexing of these, among others. Thus, bibliometric studies are recognized as a verifiable, agile and dynamic methodology to know certain qualities associated with scientific work, all of which would be valuable to know more in detail and in a more objective way about the scientific production on the evaluation of learning by university actors, particularly in Ecuador.

This fact and possibility, together with the above observations, makes the situation striking, paradoxical and even contradictory since the reality contrasts with the aspirations for improvement in higher education and what has been proposed by the Quality Assurance Council (CACES), which has recognized the role and possibilities offered by the evaluation of learning as a way for educational improvement and therefore, the need to raise research and scientific production with proposals that are decisive about educational quality, as part of the standards 10 and 11 observed and assessed (CACES, 2019).

Knowing about the scientific production related to the evaluation of learning in Ecuadorian Higher Education will allow knowing in greater depth about several quantitative data of interest that may be relevant when assessing the scientific activity and the contribution of Ecuadorian educational researchers to educational improvement, allowing us to readjust regulations, educational policies, improvement plans and to be able to establish well-directed curricular strategies.

With such purposes and motivations, this article aimed to measure the scientific production of learning assessment by actors in Ecuadorian Higher Education in the modality of the article and thesis (2011-2021).

The research questions (PI) that guided this study were as follows:

PI1. How many publications are Ecuadorian educational researchers in Higher Education on learning assessment?

PI2. What is the quantitative distribution of publications according to the type of work (articles and theses)?

PI3 What is the annual distribution of publications between 2011-2021 (behavior)?

PI4. What is the number of citations of these publications per author, in total and average?

PI5. What are the most common topics covered in these publications?

PI6. What are the keywords and what is their concurrence?

PI7. What is each Ecuadorian university's contribution to scientific production on this topic?

Methodology

The research assumed a non-experimental quantitative approach, carrying out a bibliographic, exploratory and descriptive study with longitudinal scope (Creswell & Creswell, 2017). The bibliometric method was applied based on bibliometrics (Hood & Wilson, 2001). Descriptive-inferential statistics were used for the measurement, description and analysis of the data (bibliometric indicators) to make the required inferences and deductions.

The indicators measured were: authors, Ecuadorian university affiliation, titles, year, citations, publication sources, types of publication (article or thesis) and keywords. In addition, a systematic review and analysis of the scientific literature related to learning assessment, published between 2011 and 2021 in Google Scholar records, was conducted.

It was considered that although the data provided by this academic search engine, according to previous studies and considerations made (Martin-Martin et al., 2018) reveal that almost 53% of the information provided by this search engine does not contain information and data as accurate as other sources such as Web of Science and Scopus, it cannot at the same time be ignored that this is the largest search engine on the Internet and that if it were to be dismissed, it would not be possible to value information that, like this one, is widely registered and viewed by the scientific and teaching community, thus leaving out of the analysis those quantitative data of the publications in Latindex and SciELO, for example.

The Google Scholar data was searched using Harzing's Publish or Perish (Windows GUI Edition) 8.2.3 software; the information was cleaned three times, eliminating irrelevant publications, duplicates and those with

inaccurate data associated with them. This was downloaded in a CSV file and imported into another Excel file. A total of 237 papers were collected and preserved, which were reviewed again to identify those corresponding to authors from Ecuadorian universities.

A non-probabilistic purposive sampling was carried out, considering the purpose and convenience of taking for the comparative and general analysis data from the scientific production on the evaluation of learning generated by Ecuadorian university institutions and their actors (teachers, students and master's students), which could be taken from the Google Scholar database, based on the bibliometric indicators selected for the interest of the study and the questions posed for this exploratory study.

Results

This section presents the most relevant findings of the bibliometric study concerning the questions that guided the analysis.

The first question (PI1) was to determine the number of publications by Ecuadorian educational researchers in Higher Education on learning assessment. In filtering the works related to learning assessment (n=237), 75 (31.64%) were authored by Ecuadorian researchers.

The second question (PI2) inquired about the publication type to obtain more details. In this regard, in most of these publications, 51 (68 %) appear in bachelor's and master's theses). On the other hand, only 24 articles from indexed journals were found during the period analyzed. Tables 1 (see below) and 2 (see appendix) summarize the papers' details.

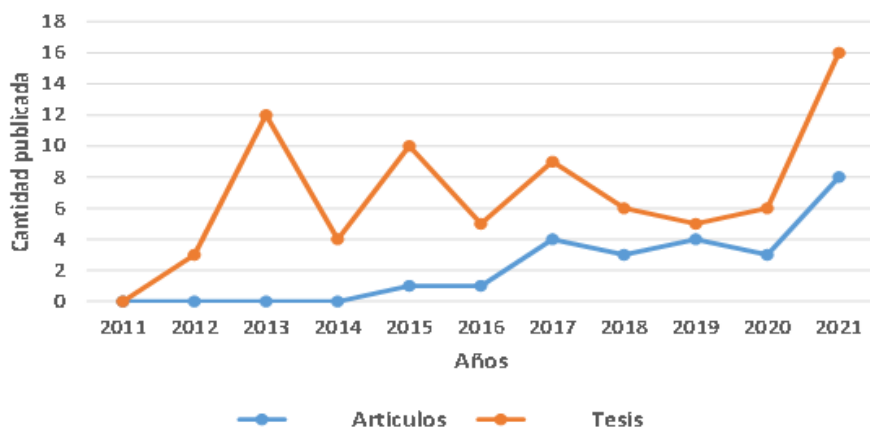
Table 1. *Scientific production of Ecuadorian university authors on learning assessment in articles in indexed journals (2011-2022).*

Quotations	Authors	Year	Source	Indexing
0	Hernández, M., Jiménez, M., Parrales, G., Paula, G.	2021	Mikarimin. Revista Científica Multidisciplinaria	Latindex
0	Criollo, M., Ramón, B., Moreno, R., Ojeda, C.	2021	Dominio de las Ciencias	Latindex, Dialnet
0	Fuentes, A., Pastora, B., Granados, A.,	2021	Revista Científica UISRAEL	SciELO
0	Rodríguez, A., Pin, L., Delgado, H.	2021	de la Universidad de las Ciencias Informáticas	Latindex
0	Aguilar, B., Velásquez, R.	2021	Revista Estudios de Desarrollo Social	Clarivate Analytic (ESCI)
0	Díaz, Y., Del Valle, I., Domínguez, N.	2021	Revista Cubana de Enfermería	SciELO
0	Quintero, A., Castro, J., Prieto, Y., Ayala, M.,	2021	Revista Atlante	EUMED
0	Guerreo, C.	2021	Digital Publisher	Dialnet
4	Velasco, C., Cardeñoso, O.	2020	Revista Perfiles Educativos	Scopus, SciELO
2	Cevallos, J.	2020	Mikarimin. Revista Científica Multidisciplinaria	Latindex
2	Hernández, M., Ruiz, Y., Tigrero, F.	2020	Revista Espacios	Latindex
5	Vásquez, M., Hidalgo, J., Avilés, M.	2019	Revista Ciencia y tecnología	Latindex
2	Hernández, M., Parrales,	2019	Innovation and ICT	Adaya Press

G.				
2	Hernández, M., Tigrero, F., Ruiz, Y.	2019	Revista Espacios	Scopus
0	Michalón., R., Michalón, D., Tobar, D., Nápoles, S.	2019	Medisur	SciELO
5	Suárez, M., Domínguez, N., Gallegos, I.	2018	Polo del Conocimiento	Latindex
3	Hernández, M., Gregori, M., Tomalá, D.	2018	Ciencias Pedagógicas e Innovación Educativa	Latindex
0	González, A.	2018	Revista Electrónica Formación y Calidad Educativa.	DOAJ
45	Hernández, M.	2017	Revista Electrónica Educare	Scopus, SciELO
4	Espinoza, E.	2017	Universidad y Sociedad	Scopus, SciELO
0	Hernández, M., Tomalá, D.	2017	Revista Congreso	Dialnet
0	CEE Cevallos, RL Ruíz, RET Romero	2017	Revista científica Olimpia	Latindex
0	Ezquerria, G., Passalaigue, R., Gil, M.	2016	Revista Científica Ecociencia	Latindex
10	Quintana, M., Gil, M.	2015	Alternativas	Latindex

The third question (PI3) made it possible to identify the annual distribution of publications in the period explored. Figure 1 shows this behavior, with the production of these being more systematic, as expected than that of articles.

Figure 1. Temporal and evolutionary distribution of Ecuadorian Higher Education publications on learning assessment.



To find out the impact of these publications, the fourth question (PI4) was oriented to identify the citations received by the publications of Ecuadorian authors on the topic of the evaluation in the period explored. In this sense, we found that citations are distributed in 11 articles, observing an average of 3.5 citations and only 0.25 for the theses.

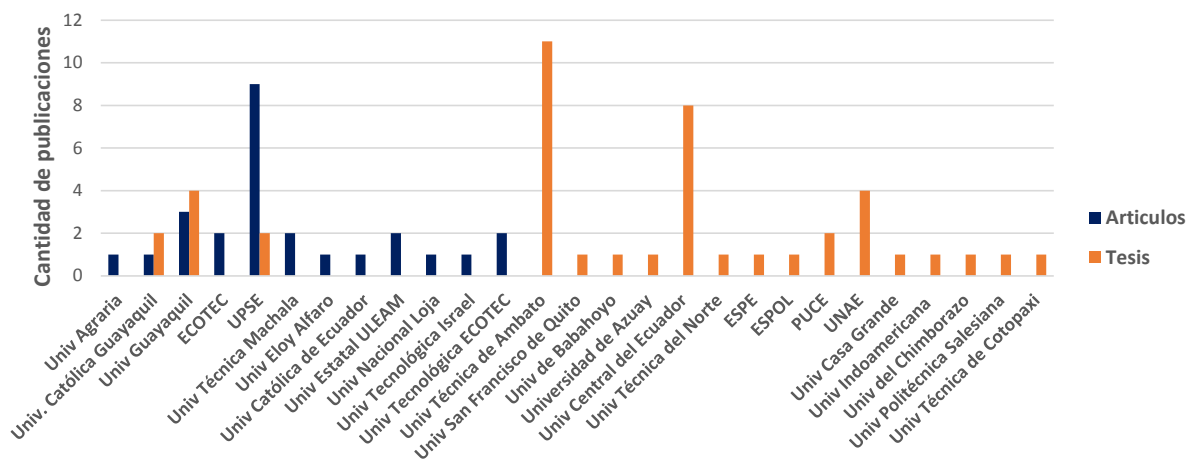
Going deeper into the analysis, the fifth question (PI5) made it possible to delimit the topics covered in these publications. As can be seen in Table 3, interesting topics were found in the published theses that have not been published as articles, a format that, as we explained earlier, seems to have greater scope and scientific impact.

Table 3. *Themes identified in the publications of Ecuadorian authors.*

Topics	Present in articles	Present in thesis
Evaluation methods, techniques and instruments: Design and application of concept maps and rubrics.	Yes	Yes
Diagnostic function of the evaluation	Yes	Yes
Perceptions of evaluation	Yes	Yes
Evaluative concepts and practices	Yes	Yes
Evaluation in the area of language	Yes	Yes
Constructivism in evaluation	Yes	No
Self-regulation	Yes	No
Evaluation in the improvement of learning	Yes	No
Educational diversity	Yes	No
Evaluation in the virtual world	Yes	No
Assessment of disruptive behaviors	No	Yes
Evaluation systems	No	Yes
Evaluation of oral expression	No	Yes
Gamification	No	Yes
Means and resources to support evaluation: Virtual and audiovisual libraries.	No	Yes
Learning theories in evaluation	No	Yes
Learning as an object of evaluation	No	Yes
Evaluation and academic performance	No	Yes

Additionally, the sixth question (PI6) allowed visualizing, through a word cloud or tag cloud, the concurrence of keywords of the articles published by Ecuadorian authors in the last decade (2011-2021), which were systematized in the data analyzed in this study. As can be seen, the labels “learning” and “evaluation” appear in the center, denoting the centrality and outstanding concurrence of both topics.

Figure 2. *Concurrence of concept terms (keywords) in articles published in journals.*



Discussion and conclusions

As indicated above, the objective of this article was to measure the scientific production on the evaluation of learning by actors in Ecuadorian Higher Education in the form of articles and theses in the last decade (2011-2021). Next, the results are discussed following the order of the IPs that guided this work, comparing and confronting the antecedents exposed in the introduction, the fruit of the exploratory phase and the bibliographic review.

First, the results obtained from Google Scholar data (2011-2021) show that the number of existing publications in indexed journal articles on the evaluation of learning in Ecuadorian higher education is scarce, which reaffirms the concerns and considerations of some authors previously analyzed. Undoubtedly, this constitutes a call for reflection of the country's educational directors and university teachers in relation to the evaluative topic. According to several authors (Perines, 2020; Rubio et al., 2018), it is convenient to critically reflect on the role of teachers and their contributions to the improvement of evaluation as generators of scientific knowledge and proposals that can contribute to improving education.

Secondly, it is striking that the results obtained reflect a greater number of publications in the form of theses than in scientific articles. It seems that there is a greater capacity to motivate and involve students and teachers in training in research and publications on the evaluation of learning in higher education in the form of articles. On the one hand, this fact can be considered positive to encourage other university actors to become involved in scientific production. On the other hand, it seems that teachers who serve as tutors or thesis directors do not manage to encourage students to publish the results in articles, a fact that concerns other higher education institutions in the area (e.g., Alarcón-Ruiz, et al., 2018). Nevertheless, the results found in our study are stimulating and encouraging, becoming one of the ways to increase research activity on the topic of learning assessment, as final degree, master's or doctoral works of teachers and future educators, respectively. Likewise, it is interesting to note that the topics (problems) addressed in this option are broader than the articles.

On the other hand, the annual distribution of publications reflected in this study is consistent with the results found by other authors (Balladares et al., 2020; Galarza et al., 2020; UTPL, 2020). It should be noted that there was an increase in the number of articles and theses published in 2020, coinciding with the stage of the COVID-19 pandemic, which could be an influential fact that motivated to publish on the experiences of many educators and generated interest in characterizing what happened in education and in the evaluation of learning under these circumstances (Villarroel et al., 2021).

The number of citations that articles and published theses have is another issue that concerns an exercise of reflection on the part of the faculty. As is known, this bibliometric indicator reflects the interest and importance

of other readers and researchers. The low number of citations registered in Google Scholar of publications on learning assessment by authors from Ecuadorian universities can be assumed as a call for attention by educational researchers. Although some authors agree that this is not an absolute indicator of scientific quality (Crici & Katinas, 2020; Oesterheld, 2013). Although some authors agree that this is not an absolute indicator of scientific quality, there is no doubt that as important as publishing is that what is published is important, valuable and useful for the educational community.

As seen in the results presented above, there was a not so wide range of evaluative topics covered in the publications. This is relatively understandable considering the small number of publications on learning assessment. Nevertheless, it is commendable that there was a notable coincidence in the approach to learning since this is the object of evaluative processes and educational improvement (Martín & Alcalá, 2022), something that is reaffirmed in the notable concurrence observed of concepts-terms (keywords) in the articles published in journals by researchers from Ecuadorian universities.

The author's emphasis on an assessment's technological and instrumental aspects is also laudable and understandable, considering the impact of information technologies in educational contexts, the evaluative praxis, and the influence exerted by the COVID-19 pandemic in the virtual or remote modality. However, it is also advisable to address the pedagogical functions inherent to assessment as an effective way for feedback, self-learning and self-regulation (Panadero et al., 2022), as well as to focus on the evaluative conceptions and ethical principles that guide and support the practice (Ríos & Herrera, 2022)..

Finally, the analysis of the contribution of each Ecuadorian university to the scientific production on the topic of learning assessment is seen as irregular and different in a comparative way highlighted in the journal articles and between these and the thesis works.

It may be thought that the lines of research in universities are not delimited according to the most pressing needs and problems at the educational level at the international and national levels, indicated in many works (Gallardo, 2018) and by the results of the institutional evaluation in Ecuador (Acurio et al., 2022). However, a not minor fact is that, according to the different criteria, dimensions and indicators assumed in the different substantive functions in this country, where research and scientific production are a focus, the greatest contributions in publications are reduced to a few universities, which coincides with the study carried out in the previous bibliographic analysis. Therefore, following Ortega-Martínez (2014), it is suggested to regulate the elaboration of theses by compendium of articles, justified by the innovation it represents in the training of researchers and by the influence they exert on the scientific productivity of universities.

The conclusions of the present study should be taken with caution, as we recognize the need to broaden the search in future works planned on the subject by the Observatory for the Evaluation of Learning (OBSEVAL) of the Peninsula Santa Elena State University (UPSE). Nevertheless, the findings of this preliminary research warn of the need for immediate actions to encourage and improve the scientific production and visibility of educational research in the Ecuadorian university environment. Particularly, due to its relevance, to the topic of learning assessment.

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Annex

Table 2. *Scientific production of Ecuadorian university authors on learning assessment in thesis works (2011-2022).*

Citations	Authors	Year	Source repository
2	Muñoz, J., Toapanta, M., Yépez, C.	2021	http://www.dspace.uce.edu.ec/handle/25000/24517
0	Rojas, J., Santamaría, J.	2021	http://www.dspace.uce.edu.ec/handle/25000/23681
0	García, A., Tovar, J.	2021	http://repositorio.espe.edu.ec/bitstream/21000/27721/1/T-ESPE-018160.pdf
0	Pérez, M., Llucó, J.	2021	http://repositorio.uti.edu.ec/handle/123456789/2356
0	Tomalá, S.	2021	https://repositorio.upse.edu.ec/handle/46000/6536
0	Mendieta, M., Sumba, J.	2021	http://201.159.222.12:8080/handle/123456789/1951
0	Zavala, D., Alvarez, C.	2021	http://www.dspace.uce.edu.ec/handle/25000/24163
0	Prado, L., Pérez, P.	2021	http://www.dspace.uce.edu.ec/handle/25000/23889
0	Quito, T., Quito, W.	2020	http://201.159.222.12/handle/123456789/1826
0	Bravo, B., Pacheco, P., Izquierdo, W.	2020	http://repositorio.unae.edu.ec/handle/123456789/1645
0	Labanda, F., León, D.	2020	http://repositorio.unae.edu.ec/handle/123456789/1405
0	Narváez, J.	2019	http://dspace.pucesi.edu.ec/handle/11010/457
1	Paredes, J., Sánchez, I.	2018	http://repositorio.uta.edu.ec/handle/123456789/28458
0	Chávez, A.	2018	http://201.159.223.180/handle/3317/11967
0	Rosero, L., Aucapiña, M.	2018	http://repositorio.uta.edu.ec/handle/123456789/28474
0	Flores, J., Rovira, R.	2017	https://www.dspace.espol.edu.ec/handle/123456789/37007
0	Arevaldo, F.	2017	http://repositorio.ug.edu.ec/handle/redug/26891
0	Cevallos, J.	2017	https://core.ac.uk/download/pdf/143295219.pdf
0	Paredes, J., Timbela, L.	2017	http://repositorio.uta.edu.ec/handle/123456789/24618
0	Elizondo, M.	2017	http://dspace.utb.edu.ec/handle/49000/3436
0	Molina, A.	2016	http://200.31.31.137:8080/handle/ucasagrande/880
0	Chasiluisa, I., Samueza, M.	2016	http://www.dspace.uce.edu.ec/handle/25000/11648
0	Vera, D.	2016	http://dspace.utb.edu.ec/handle/49000/2188
2	Shamsutdinova, E.	2015	http://repositorio.puce.edu.ec/handle/22000/10370
1	Medina, W., Guanoquiza, W.	2015	http://repositorio.uta.edu.ec/handle/123456789/13242

0	Bermúdez, E.	2015	https://dspace.ups.edu.ec/handle/123456789/11693
0	Plutarco, O.	2015	http://repositorio.ug.edu.ec/handle/redug/26881
0	Guevara, R., Pumalema, B.	2015	http://dspace.unach.edu.ec/handle/51000/2444
0	Lana, G., Sánchez, N.	2015	http://repositorio.uta.edu.ec/handle/123456789/11754
0	Defaz, N., Sillo, B.	2015	http://repositorio.utc.edu.ec/handle/27000/2403
0	Tigrero, F.	2015	https://repositorio.upse.edu.ec/handle/46000/2924
0	Indacochea, L., Basantes, M.	2015	http://repositorio.uta.edu.ec/handle/123456789/13132
1	Carrasco, V.	2014	http://dspace.utb.edu.ec/handle/49000/2553
0	Reinoso, L., Crespo, N.	2014	http://www.dspace.uce.edu.ec/handle/25000/3278
0	Vivas, B.	2014	http://repositorio.ug.edu.ec/handle/redug/30744
0	Cuaical, M.	2014	http://repositorio.utn.edu.ec/handle/123456789/4223
2	Alvarado, A., DT- Castro, W.	2013	http://repositorio.uta.edu.ec/handle/123456789/7253
1	Ledesma, Y., DT- Vásquez, A.	2013	http://repositorio.uta.edu.ec/handle/123456789/7227
1	Molina, G.	2013	http://repositorio.puce.edu.ec/handle/22000/5829
0	Esquivel, P., Laso, R., Brito, P., Caguana, M.	2013	https://dspace.uazuay.edu.ec/handle/datos/528
0	Álvarez, O.	2013	http://repositorio.ug.edu.ec/handle/redug/3417
0	Bastidas, P., Manzano, C.	2013	http://www.dspace.uce.edu.ec/handle/25000/2019
0	Guangatal, A., DT- Calero, X.	2013	http://repositorio.uta.edu.ec/handle/123456789/7245
0	Pazmiño, V., DT- Chimbo, E.	2013	http://repositorio.uta.edu.ec/handle/123456789/5727
0	Madruñero, A., DT- Esparza, R.	2013	http://repositorio.uta.edu.ec/handle/123456789/5466
0	Vizcano, M., DT-Bustos, M.	2013	http://repositorio.uta.edu.ec/handle/123456789/7237
0	Villacís, Y., DT-Núñez, J.	2013	http://repositorio.uta.edu.ec/handle/123456789/7236
0	Vargas, B., DT-Proaño, Z.	2013	http://repositorio.uta.edu.ec/handle/123456789/5536
1	Ballesteros, W.	2012	http://repositorio.uta.edu.ec/bitstream/123456789/2541/1/MA-DC-ES-883.pdf
1	Palacios, L., DT-Núñez, J.	2012	http://repositorio.uta.edu.ec/handle/123456789/5777
0	Suárez; O.	2012	http://repositorio.ug.edu.ec/handle/redug/1388

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