Institutional, Academic, and Learning Analytics: a bibliometric study

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***Abstract*—Educational institutions are increasingly adopting data-driven approaches, yet there appears to be insufficient exploration into the development of so-called Institutional and Academic Analytics and how these terms intersect with Learning Analytics (LA). This study conducts a bibliometric analysis (last 10 years) as an initial step to explore this gap. Our results illuminate evolving but inconsistent interest in Institutional and Academic Analytics across time and across publication venues. The results also indicate a need for the LA community to clarify its connections with related applications of data analytics focused on students and their contexts while reflecting on and potentially expanding its areas of impact.**

***Index Terms*—Institutional Analytics, Academic Analytics, Learning Analytics, Bibliometric Research**

I. Introduction

Research in Learning Analytics (LA) has predominantly concentrated on monitoring and analyzing student engagement within the learning process, offering insights into student behaviors and performance. However, according to its definition as the "measurement, collection, analysis, and reporting of data about learners and their contexts, for the purpose of understanding and optimizing learning and the environments in which it occurs" [1], there are opportunities to broaden the field's scope and expand its horizons (theme of LAK 2025). For example, by integrating multiple data sources, such as information about both learners and teachers across individual and multiple courses, it is possible to address a wider range of use cases with impacts ranging from individual/team levels to organizational levels [2], [3].

When these use cases involve decision-making to improve learning environments at the level of educational institutions, research often uses alternative terms to "Learning Analytics," such as "Institutional Analytics" or "Academic Analytics","that refers to the process of collection, analysis, and visualization of academic program activities such as courses, degree programs; research, revenue of students' fees, course evaluation, resource allocation, and management to generate institutional insight" [4], [5]. Yet, these terms are often found disconnected from the notion of learning analytics. It is also unclear in which publication fora papers using those terms are being published, or to what extent they can be found in venues centered on LA.

The proliferation of terminology and their interrelation necessitates clarification to better understand the field's evolution and areas of utility. To this end, this paper contributes with a bibliometric study as a preliminary step toward achieving that goal. The study seeks to answer the questions when the terms are being used in ways that align with the LA definition: RQ1 - How are the terms "Institutional Analytics" and "Academic Analytics" evolving in research? RQ2 - To what extent are the terms "Institutional Analytics" and "Academic Analytics" being explicitly used in connection with the term "Learning Analytics"? RQ3 - Where are the papers using these terms being published?

II. Methodology

Five search queries were used to extract the relevant results across the databases: To answer RQ1, we search for: (1) "Academic Analytics" OR "Institutional Analytics" OR "Academic Analytic" OR "Institutional Analytic" (AA|IA). To answer RQ2, we searched for different combinations to compare with learning analytics: (2) "Learning Analytics" AND "Academic Analytics" (LA&AA). (3) "Learning Analytics" AND "Institutional Analytics" (LA&IA). (4) "Learning Analytics" AND ("Academic Analytics" OR "Academic Analytic" OR "Institutional Analytic" OR "Institutional Analytics") (LA&(AA|IA), (5)" Learning Analytics and Institutional Analytics and Academic Analytics" (LA&IA&AA). Table 1 shows the outcome of the search when considering the whole text of the manuscripts. To ensure the relevance of the retrieved papers, we applied a first filter that considers the presence of the search string only in the title, abstract, and keywords [8].

To further ensure relevance of their scope in their fitness with the LA definition, two researchers evaluated the resulting documents, analyzing if they were actually focused on "data about learners and their context to understand or optimize learning environments". Following independent analyses by

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TABLE I

NUMBER OF ARTICLES (FROM 2014 - 09/2024) FOUND IN THE DATABASES FOR EACH SEARCH STRING, BEFORE AND AFTER THE FILTERING CRITERIA, AND PUBLICATION FORA. (LAK - INT. CONF. OF LEARNING ANALYTICS AND KNOWLEDGE, STARTED IN 2011; JLA - JOURNAL OF LEARNING ANALYTICS, FIRST VOLUME IN 2014; ICALT - INT. CONF. ON ADVANCED LEARNING TECHNOLOGIES, STARTED IN 2001).

Search strings	Total (search in the whole papers) (IEEE Search / Scopus / ACM /Science Direct)	After applying the 1st filtering criteria (only title, abstract, and keywords)	After applying the filtering 1st + 2nd criteria (two humans checking alignment with LA definition)	# of different publication fora, after filters 1-2 (# in LAK, # in JLA, # in ICALT)
AA|IA	**1525** (25/1362/66/188)	115	95	**71** (1* JLA, 1** LAK, 1*** ICALT)
LA&AA	**834** (16/823/47/50)	26	24	**22** (0 JLA, 0 LAK, 0 ICALT)
LA&IA	**51** (0/43/7/25)	4	4	**4** (1* JLA, 0 LAK, 0 ICALT)
LA&(AA|IA)	**874** (16/856/52/54)	29	28	**25** (1* JLA, O LAK, 0 ICALT)
LA&IA&AA	**38** (0/12/3/24)	1	1	**1** (0 JLA, 0 LAK, 0 ICALT)

* [5], ** [6], *** [7]

each researcher, they discussed and resolved any disagreements in the final paper selection, ultimately reaching full consensus
(Cohen's Kappa = 1.0).

To address RQ3, an analysis was conducted on the number of publication venues for these papers, including a count of how many were published specifically in dedicated LA fora.

III. RESULTS

To further answer RQ1, Figure 1 shows the temporal evolution of the publications.

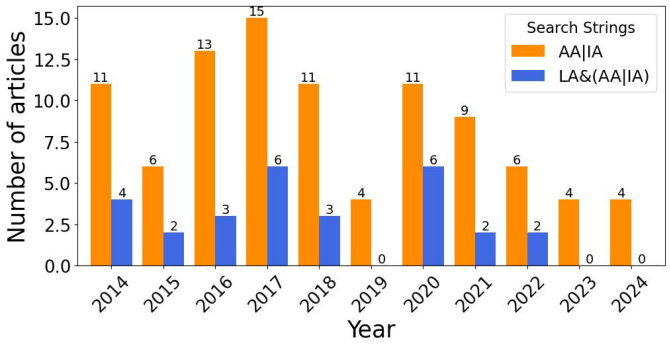

Fig. 1. Number of articles by year of publication (from 2014 - 09/2024) after filtering (1st, 2nd).

Thus, results indicate that there have been at least 95 papers published that use the terms "Institutional Analytics" and "Academic Analytics" in ways that align with the Learning Analytics definition. There were more publications using those terms in the years 2016 and 2017, however, the trend over time shows fluctuations without a clear pattern (RQ1). Yet, only 29.5% (28/95) of these papers include explicitly the LA term (RQ2). There are 24 of those dealing with AA that include the mention of LA, and only 4 of those using the notion of IA that include the term LA. Interestingly, only three of the filtered papers have been published in devoted forums for LA research (RQ3), i.e. LAK, JLA or ICALT (one in each, LAK or JLA in 2022, and ICALT in 2016). And two of these papers (the one in LAK and ICALT) does not include the term LA in the title, abstract, and keywords. The diversity of fora in which these papers have been published is notable (71 different publication venues for 95 papers dealing with IA or AA; 25 different publication fora for 28 papers mentioning LA and IA or AA).

IV. DISCUSSION AND CONCLUSIONS

The responses to the research questions illuminate a notable amount of research employing the concepts of "Institutional Analytics" or "Academic Analytics" in alignment with the LA definition, averaging about (at least) 9.5 papers per year. However, less than one third of the papers include an explicit mention to the LA term in their title, abstract and keywords. And only three of the papers were published in devoted LA fora (LAK, specific track of ICALT, JLA). The temporal evolution of the publications does not reveal a clear pattern. Similarly, there is no discernible pattern in the range of venues for the publications, as they are numerous and varied.

These are interesting results that open questions to the LA field, including: To what extent does the LA community embrace research that explores its potential impacts at the organizational level [3]? How can the horizons of LA be expanded from this perspective? Does the proliferation of terminology in educational data analytics facilitate or hinder the evolution of LA research? How does LA connect with the notion of "Institutional Analytics" and "Academic Analytics" and which are the overlaps? As a bibliometric analysis, this study may exclude papers that use less explicit terminology (e.g., see first outcome of search in Table 1) and is constrained by quantifying trends and associations [8]. Future research could address these limitations by expanding and deepening the analysis to include a qualitative examination of the connections between related analytical notions. Qualitative analyses could help better understand how the terms are used and the

research content related to the connection between LA, AA, and IA.

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