

Challenges Affecting In-library Use Data Integration in Learning Analytics Initiatives: The Greek and Spanish University Community Perspective

Abstract

PURPOSE: As Learning Analytics emergent field nowadays is seen as a way to break barriers to intra-institutional collaboration that will ultimately lead to educational deep transformational change, HE administrators and LIS researchers argue on the purpose of connecting in-library user activity data to campus wide initiatives, their relevance and potential contribution to library strategic alignment with broader institutional goals.

In this realm and framed within a PhD research, this paper provides an overview of preliminary findings relevant to the exploration of the potential of Spanish and Greek Academic Libraries to becoming involved in Learning Analytics initiatives

DESIGN/METHODOLOGY: Qualitative semi-structured interviews taking place at 3 Greek and 2 Spanish University libraries

FINDINGS: Present paper is limited to reporting and analyzing interim findings associated with participant perceptions from an outsider's perspective on contextual factors, namely generic current scenario pain points, potentially impacting the integration of library use data in campus-wide Learning Analytics initiatives and precedes the analysis of specific complexities involved at the time of LA-related library intervention design and implementation.

RESEARCH LIMITATIONS:

Study limitations associated with the relatively short amount of time spent in the interview process and the narrow range of stakeholders (namely students and librarians) chosen to participate are to large extent offset by expert input as recorded in current bibliography.

ORIGINALITY/VALUE:

It is the first Greek and Spanish university library study aiming to contribute to the dialogue on whether, how and when the wealth of in-library use generated knowledge could be capitalized within future context-specific Learning Analytics initiatives.

Keywords: academic library, Learning Analytics, in-library use

Introduction

For academic libraries as human and political systems that constantly interact with their environment, to be able to maintain their relevance and remain meaningful to their users, (Michalak, 2012) they must redefine their role (Li, 2006), leverage their strengths and come up with strategies to support greater user involvement through the creation of responsive and convenient services (Brindley, 2006) which if not based on rigorous data gathering and analysis are not likely to produce any benefits.

In response to today's polymorph Learning Resource and Research Center (LRRC) weaknesses and external pressures to justify its budget and prove both its operational and strategic alignment with wider institutional goals, the systematization of in-library use data collection as seen through the Big Data and Analytics lenses can provide new exciting opportunities (Hoel et al. 2015) in the new informational scenario where data intensive computing has considerably broadened the scope for data collection and sharing.

Sense-making of Library Involvement in Learning Analytics Initiatives

Academic libraries so far have been focusing on the production of accountability data through (Oakleaf, 2010; Lippincott, 2006) gate, workstation, equipment use and reference question counts, user satisfaction and service quality ad hoc or periodical surveys, surrogate measures of impact (Everest & Payne, 2001) published in a sporadic disconnected way and failing to explain to those outside the field what contributions they make to student success.

Unsure how to "collect, analyze and apply the data effectively in library management" (Lippincott, 2006) "or simply collecting data to prove they were busy and productive" (Chen et al., 2015), librarians have been having a hard time proving that actions taken lead to improvements in learning, teaching and research (Oakleaf, 2010), are often quietly omitted from the accountability and assessment conversation and don't embrace systematic change until stakes are high enough to make radical reinvention imperative (Deiss & Petrowski, 2009); their predominant mode of library use data gathering still being the "collected but not connected" and "collected but rarely used" paradigms with monitoring dominating over proactive response purposes (Yanosky, 2015).

Furthermore, academic librarians, as part of a complex educational system with multiple interacting entities (Siemens, 2012), with professional norms, symbolic artefacts, strong focus on process and inputs (Jantz, 2012), and significant administrative and financial external controls that limit innovation and contribute to the profession's inherent inertia, see most innovation as incremental with respect and a high degree of compatibility to existing systems (Jantz, 2012; Brundy, 2015) and fail to build a capacity for the creation and sharing of new findings about their work (Neal, 2012).

Although, generally, few are the examples of library administrators sympathetic to library innovation because of their focus on input and failure to see contributions on output and even fewer the examples of a more systemic approach to operations and services in the South European post-digital research library, libraries as learning organizations offering a package of technology, workplace, content, learning opportunities and coaching (Ritchie, 2010) and well aware of the potential of data, and in response to

1. a series of critical questions around
 - research library issues that the technological developments still cannot solve
 - the problem of measuring whether Information Commons have achieved their goals and whether they have made a difference in student success and retention
 - library data under-representation in institutional enterprise data and reporting systems
 - data collection policies necessary to library's alignment with Higher Education priorities and institutional goals
2. the twin pillar paradox where librarians defend "business as usual" and at the same time strive to create efficient operations responsive to student and faculty needs, and
3. the pressing need to convince decision makers, with library budgets remaining flat at best, that librarians can
 - plan for their future using the same data-driven decision making techniques used in industry
 - demonstrate their role to student learning and value on investment
 - connect library value to university mission
 - articulate outcomes through a set of systematically collected and analyzed data that not only describe the organization but also help evaluate whether library is fulfilling its mission by reflecting yesterday, today and tomorrow , as librarian expertise alone is not a sufficient demonstration of library service "preciousness" anymore (Poll, 2003)

seek to find new ways to maintain their viability as a center piece of their institutions and develop an even higher profile within the context of institutional outcomes, make better data-informed decisions and become less "gut instinct" reliant (Stiles, 2012) and less satisfaction measures and opinion surveys oriented by actively engaging in exploring the power of analytics that will enable them to move beyond simply counting and compiling statistical measures to more complex data analysis (Cox & Jantti, 2012).

More specifically, as inputs and outputs no longer resonate with many HE stakeholders (Oakleaf, 2010) and a growing number of learning organizations are already considering including library data along with other often disparate datasets from across the institution in a Learning Analytics (LA) comprehensive platform, there is an increasingly rich overseas research and institutional experimentation landscape aimed at exploring and exploiting the possible uses for library data

with discussion points including the real opportunity for libraries to both take a strategic lead on campus in the data and analytics area and to use this data and expertise to create new knowledge and develop new or improved services to enhance student experience and connections between their contributions and institutional outcomes.

Seen library use data integration in Learning Analytics (LA) systems, that already capitalize on a wide range of data produced by and gathered on behalf of students and analysis models to predict and advise on learning (Siemens, 2010), as part of contextual integrity maintenance contributing to building more complete learner profiles (Hoel et al. 2015; Laurillard, 2013), marks a

- Significant turn from the time-honored practice of measuring success against peer libraries, in favor of judging themselves by how libraries help their institutions succeed (Oakleaf, 2010)
- The process of realignment and reorganization towards a structure that supports the university's academic plan
- A change in data sharing practices that nevertheless requires apart from capital investment, a conducive climate, the right training and a committed and enthusiastic leadership.

No matter what challenges and ethical and practical considerations may be involved in library data collection systematization and further integration in LA systems, namely (1) the introduction of Big Data to education, (2) the lack of visibility of collected library data (information silos), (3) the lack of national and international instruments for the harmonization of LA, (4) intra-institutional interoperability issues and (5) the lack of skilled professionals in the field, (6) cross-functional teams and robust mechanisms enabling stakeholders' participation in important analytics decisions, and (7) skepticism surrounding learning and teaching measurements and the insufficiency of HE institutions policy frameworks to addressing the ethical issues linked to LA potential (Jones & Salo, 2017), I see in-library student activity data integration in the learning and teaching process as a co-creation and service innovation opportunity under the Knowledge innovation, value co-creation and quality management lenses can be proven extremely helpful to re-imagining people, facilities and services and to helping recalibrate strategic plans.

Current Trends, New Perspectives

As stressed before, for Academic Libraries to stay socio-cognitively relevant with changing Higher Education and Knowledge Society landscape, they ought to become fully cognizant of what is going on in library spaces which without systematizing Library activity data recording processes would be highly impossible. However, no matter how important streamlining this operational change can be to proving their value and contributions to student success, it doesn't per se guarantee that librarians will be able to make sense of the enormous data volume generated without having ab priori been adequately informed of and educated on the potential

impact and benefits of their active involvement in campus-wide LA initiatives. To that end, there has lately been observed an increasing effort of New Critical Skills (NCS) integration to official LIS education and an outbreak of

- **network** formation among which SNOLA (Spanish network of LA) formed in response to the Spanish Ministry of Economy and Competitiveness call for “networks of excellence” in 2015 and SOLAR (Society for learning Analytics Research) interdisciplinary network of leading international researchers both exploring the role and impact of analytics on teaching and learning, aiming to raising awareness and creating opportunities for the diverse LA stakeholders to communicate and collaborate
- general **LA support tools development**,
 - single out-of-the-box solutions, e.g.from TRIBAL’s Student Insights to open source SSP (Student Success Plan) overseen by Apereo Foundation
 - Institution-wide homegrown applications among which the Nottingham Trent University (NTU) Student Dashboard, Purdue University Signals Program, University of Maryland Check-My-Activity tool
 - Library-oriented homegrown apps at the example of the University of Wollongong Library Cube interface development linking student usage data to academic performance analysis
- JISC and Open University UK **Codes of Practice and formal policy and guidance documents** that drawing from expert workshops, webinars and open publications aim helping universities and colleges in the UK to develop effective approaches to a variety of issues relating to the LA practice
- UNESCO, USA Department of Education and Australian Office for Learning and Teaching **policy briefs** providing LA use real-world examples and recommendations for HE institutions and policy makers¹
- European Commission and Alliance for Excellent Education (USA) **reports² and guides** offering practical information on risks associated with adopting or not adopting (Stiles, 2012) LA in HE settings and

¹ Shum, S. B. (2012). UNESCO Policy Brief: Learning Analytics. Technical report, available at

<http://www.iite.unesco.org/publications/3214711/>

Bienkowski, M., Feng, M., & Means, B. (2012). Enhancing teaching and learning through educational data mining and learning analytics: An issue brief. US Department of Education, Office of Educational Technology, 1, 1-57 available at <https://tech.ed.gov/wp-content/uploads/2014/03/edm-la-brief.pdf>

² European Commission, Report to the European Commission on New modes of learning and teaching in higher education, October 2014 available at

http://ec.europa.eu/dgs/education_culture/repository/education/library/reports/modernisation-universities_en.pdf

Inamorato dos Santos, A., & Punie, Y. (2016). Opening up Education: A Support Framework for Higher Education Institutions (No. JRC101436). Directorate Growth & Innovation and JRC-Seville, Joint Research Centre.

Wolf, M. A., Jones, R., Hall, S., & Wise, B. (2014). Capacity Enablers and Barriers for Learning Analytics: Implications for Policy and Practice. Alliance for Excellent Education. <https://all4ed.org/reports-factsheets/capacity-enablers-and-barriers-for-learning-analytics-implications-for-policy-and-practice/>

- **Research** exploring academic libraries' appetite for analytics through surveying (Jisc LAMP project³, LACE project⁴), facilitating the professional discourse in the field and investigating correlations between library services patron attendance (workshops, research consultations, reference service) and student success.

Scope, Paper Objectives

In this vein, our paper aims providing a brief overview of preliminary findings relevant to the exploration of the potential of Spanish and Greek Academic Libraries to becoming involved in Learning Analytics initiatives. As little is known about the extent to which institutional units are ready to embark on an analytics intervention, we searched for indications of current scenario pain points under the imminent learning analytics transformational change, that is already becoming mainstream abroad, by collecting feedback from the very stakeholders in order to provide a more realistic understanding of the public university library ecosystem.

Tsimpoglou & Papatheodorou paper (2000) on library integration in the learning and teaching process, Richard Boss's Public Library Association article on library statistics (2006), ALA library-oriented learning analytics related Spring 2016 seminars and Megan Oakleaf's (2016) advice in regards to the necessity of devising and conducting searches to determine university library LA integration, have provided the impetus to decide departing on this research based on the assumption that libraries should soon assume their role in the imminent LA related campus wide transformational change

Considering Library involvement in LA analytics both as part of a new kind of process reshaping information flows between institutional IT systems and stakeholders since LA -according to LACE Report 2016- is already seen by many as a way of achieving transformational change in education and a means of successful alignment of business strategy with IT strategy leading to increased organizational performance (Chan et al. 1997), this research is a first step to anticipating the adoption of LA and subsequently better prepare librarians to make the leap from surveys, door counts and traditional statistical methods to library integration in LA systems by developing a framework that will constitute the conceptual basis for recommendations.

In this era of changing paradigms where faculty, student affairs professionals, students and library administrators are all gradually becoming involved in the broad conversation about learning commons' impact on the learning and teaching process, this study attempts as a way of bringing part of these perspectives together to the discussion recording librarian and student understanding of organizational forces and operational issues that pervade the context they share, work, study in, under the perspective of upcoming developments.

³ Library Analytics and Metrics Project information available on <http://jisclamp.mimas.ac.uk/about-lamp/>

⁴ Learning Analytics Community Exchange EU funded Project info available on <http://www.laceproject.eu/lace/>

More specifically, library staff and user richly textured view of library integration in LA initiatives hindering factors provided us with an initial set of highly recurring common themes, that is envisioned to becoming further complemented with expert input and mini-survey findings in order to contribute to baseline knowledge on the unique context and characteristics of Spanish and Greek Public University libraries that in the face of full integration to the European Higher Education Area and in their attempt to respond to the Bologna Reform mandates have attained in their majority moderate to high LRRC model compliance, with their administrators acknowledging among key factors impacting the proper performance of University information centers, apart from intra-institutional coordination according to recent research (Pacios, 2015), budgetary, infrastructural and librarian Professional Development issues.

Rationale

Our binational qualitative research took place at 5 South European (Greece, Spain) university libraries where 16 librarians and students were interviewed in a semi-structured interview question format on current scenario inhibiting factors to the potential capitalization of library data collection within LA initiatives. Apart from author’s familiarity with context-specific issues, it was the two countries’ shared similarities in terms of higher education participation rates, public university volume, academic library employee civil servant status, university rankings and economic crisis that have been a strong motivator for conducting this binational research.

Research Settings, Sampling

The small participant sample, nonetheless sufficient for a first exploratory study, representing five stakeholder categories, namely library executive staff, directors, undergraduates, postgraduates and interns as illustrated in Figure 1, comprising ten (10) female and six (6) male respondents covered a wide range of disciplines as to better represent key stakeholder community.

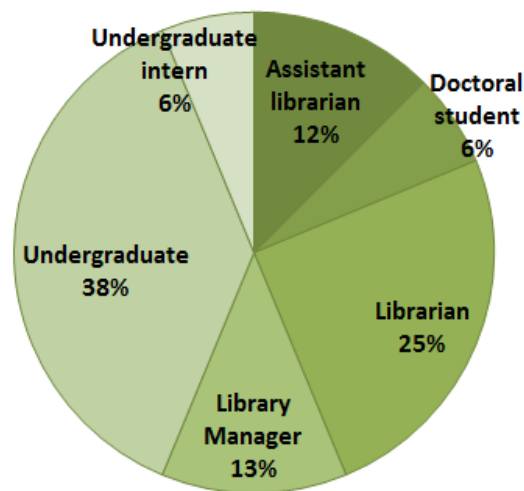


Figure 1. Participant Demographics

Library staff respondents were recruited via chain referral while student-participants were randomly selected at the case settings. Interviews were conducted in participants' native languages in various institutional library locations depending on participant preference and/or location availability. Each participant was interviewed only once and for between 10 to 50 minutes, a total of 310 minutes and average interview duration of 30 minutes for the Spanish research segment and between 14 and 27 minutes, a total of 113 minutes, average duration of 18 minutes (6 interviews) for the Greek respective one. Interviews transcribed and translated to English yield a total of 100 pages that were later on analyzed to identify potential patterns.

Research Approach, Methodology

A Straussian grounded theory approach was adopted as we were not seeking to validate an existing hypothesis but rather enter the world of participants from their perspective and in doing so make discoveries that will contribute to the development of empirical knowledge (Corbin & Strauß, 2008) and help generate theory for areas where little information is available. In our case formal pilots were not considered necessary because chosen qualitative research format allowed for a high degree of flexibility.

As to questionnaire items formulation, there has been an effort to avoid learning analytics terminology as much as possible since it is not yet a widely spread term in academic LIS environments. Instead, paraphrasing was chosen as the optimal solution.

Following a structured interview protocol which prior to the Observational phase was communicated to library directors, an informed consent form providing details about data analysis publication, sharing and access reassuring participants about anonymity and confidentiality issues in the analysis and results reporting was signed by both parties, researcher and interviewees at the beginning of each session.

Although semi-structured interviews were deployed around the desk research derived dimensions of infrastructure, skills, partnerships, resources, ethical considerations, privacy and organizational culture, coding was extracted inductively from the text during the analysis phase, our goal being the creation of theory grounded in the data.

Our interviews were terminated when reaching theoretical saturation that occurs when theoretical concepts can't be filled with any new data (in terms of redundancy and variation) and which in our case happened for the Spanish and Greek research components with the tenth and sixth interview respectively.

Finally, the amount of observation time necessary to collect reliable data for this study was analogous to the time necessary to establishing a comfortable degree of rapport with people, situations and settings involved.

Key Findings' Analysis

As Greek and Spanish public academic librarians suffering the effects of similar staff and expenditure reductions under the Big Recession effect (Simon-Martin et al. 2016) major concerns expressed from both sides were associated with funding, labor-intensive librarian involvement and finding ways to raising library visibility, showcasing library value, changing organizational structures and increasing innovation oriented culture that would eventually help develop an appreciation of benefits related to library integration in wider LA initiatives.

The researcher engaging in a systematic and iterative review of the interviews developed an emergent codebook in a mixed content analysis approach both recording frequency of occurrence of words and phrases and grouping together terms with same meaning and patterns; label categories assigned were adopted from available literature and own research experience.

Interview transcripts analyzed under a macro-evaluation and micro-evaluation lens, the first juxtaposing intercountry differences and the latter examining participant inter-groupal perspectives.

More specifically, library directors and supervisors more aware of difficulties and technical, operational and administrative challenges related to disruptive change and the repercussions associated with transcending the institutional strategic planning framework as articulated by central administration seemed more consumed by time and space constraints, data collection over-aggregation, information silos and inflexible organizational structures/ communicational culture issues: Among library managers' key observations:

"...Databases are disconnected. Library systems don't have anything to do with online educational resources, Moodle or registration data whatsoever. It's all quite disaggregated"

"Everything is done with delay... I can't say for sure whether someone is being processing library use statistics."

"...We currently dispose data that serve knowing which service is used less or more frequently. But what we aren't very much aware of is what they need... They [students] don't know the amount of services we can offer...it would be absolutely great if we were to know how to motivate them"

to further comment on the importance of ...

" know[ing] what students think of the library...we, inside the library are fairly paternalistic. We are the ones who say what the users need."

“The intellectual capital that is library-based student activity is not been exploited...Current organizational structure doesn’t facilitate dialogue in a bottom-up approach.... The way things are articulated today, there is little room for initiative”

Students on the other hand emphasized low automation index, operational issues associated with non-systematic library use data collection, institutional isomorphism, user/librarian disconnect and user demotivation:

“I firmly believe that there are no library use data kept”

“As to in-library use, no detailed data are being kept, there is no personalized data collection”

“Departmental libraries all follow the same space planning, operational and organizational patterns”

Finally, financial downturn implications for librarian Continuing Professional Development (CPD) were made apparent by all stakeholder categories, congruent with Apostolidou & Miftarai research (2013) on public academic librarian perceptions regarding the effects of the economic crisis on the Greek library system according to which a 70% of respondents acknowledged an Information Professional training deficit; our respondents emphasizing that:

“There is little room for change where staff Professional Development and funding is concerned”

“I think they [librarians] try hard to stay updated but there is not sufficient training and development....I wish the institution could do things for the staff”

From the librarian perspective, although in their majority they usually express their confidence in their skills adequacy to coping with present job requirements our research has recorded their concerns about valued future skills and the system weaknesses to address the CPD issue in a systematic and proactive approach.

With regards to the behavioral part of the interview, participants reflected on their experiences taking a somewhat future orientation demonstrating a strong willingness to share their considerations on academic library scenario pain points.

For Figure 1. visualization purposes and framed within our intention to help readers better appreciate top interviewee-reported issues involved, we aggregated faculty/librarian/student

disconnect, limited librarian /student interaction, non-student centered library operations and low library service awareness under the communication culture issues umbrella concept.

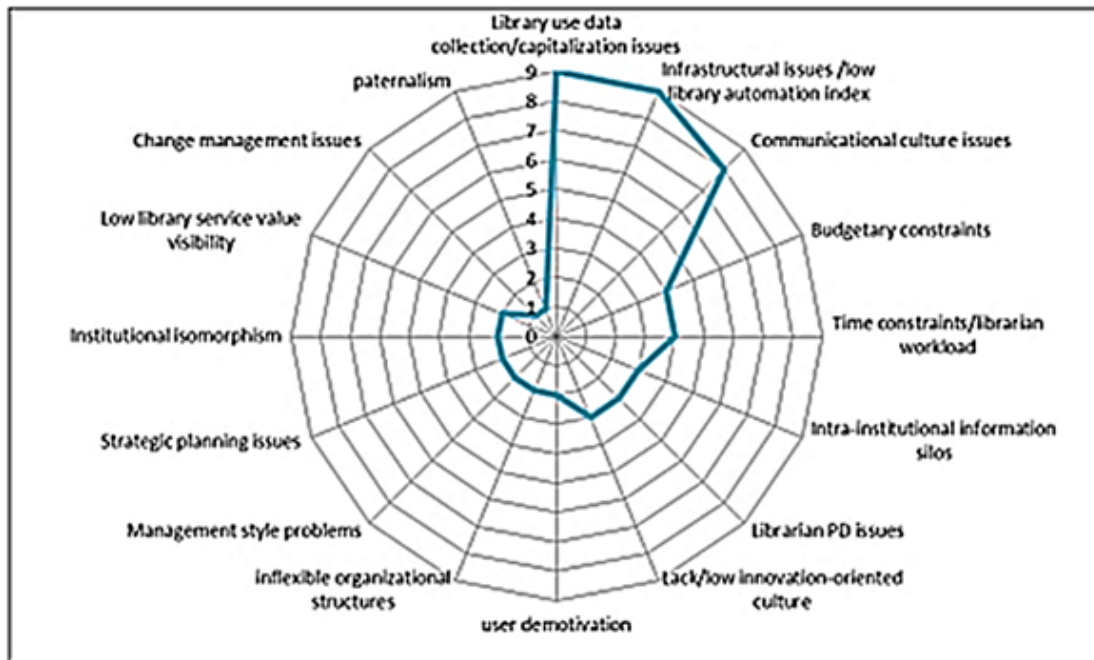


Figure 1. Inhibitors to Library use data integration in LA initiatives

Similarly, low automation, limited library infrastructural capacity, space constraints and library use data processing delays were included in the infrastructural issues label while the need to showcase library value, services, return on investment and impact on student outcomes were grouped under the value/visibility tag. A more detailed code breakdown is illustrated in the chart included in the appendix at the end of the document.

Limitations:

Inherent limitations involved with this exploratory study are not very much different from validity/generalizability issues facing all qualitative research. Part of current research value and originality resides on its qualitative approach since up until today most studies had been limited to a post-hoc measurement of patron satisfaction.

Identifying connections among the interviewees' viewpoints were considered to be the researcher's best alternative to generalizability (Lincoln & Guba, 1985) and representativeness, as the researcher believes that with participants describing similar experiences their stories and reflections have acquired more power.

Taking into account the fact that as data collection coincided with a major economic downturn with implications for the library world that was impossible to capture in a single study, inevitably

current phenomenographic research which is a snapshot set in a specific time and under specific circumstances, can only be considered a single step in a larger exploration. Nevertheless, this work will hopefully pave significant areas for future investigation aiming raising questions and helping better appreciate some of the context specific complexities involved that if tackled Library Analytics prospects could be well improved,

Significance

Though there have been numerous studies on user perceptions of service quality and librarian skills, there has not been any previous research examining the Academic librarian perceptions of potential inhibiting factors to library dynamic involvement in the learning and teaching process through integration of library data in learning analytics initiatives that could allow, according to Long & Siemens (2011), universities to help all stakeholders penetrate “the fog that has settled over much of higher education”.

Conclusions

As library staff is becoming more heterogeneous and multi-disciplinary since the number of professionals entering the field from other domains of knowledge keeps rising and collaborations, convergence, partnerships and new enhanced services are continuously added to Academic library routines, the need for addressing LIS research topic in multi-faceted and multi-dimensional ways becomes even more pressing.

In this realm, data gathered in the second half of 2016 have been targeting the investigation of both climate and operations, bringing to light significant information on stakeholder perceptions around:

- Current infrastructure and librarian Professional Development issues
- Collaboration Culture
- Academic Library use data collection and sharing paradigms

aiming this way to offer a conceptual model of issues that it would be most interesting to further exploring and contribute to identifying factors conducive or supportive to library integration in learning analytics initiatives facilitating the formulation of context specific recommendations.

Through responses to interview questions, this research seeks to raise awareness of key problems as noted by a number of university library stakeholders, hoping these insights and identified variables will be useful to both (1) library practitioners working in a time of profound change as it might extend their understanding of reasons impacting the systematization of in-library user activity data collection and sharing practices and to (2) Library policy makers envisioning sustainable development in a way that it could truly adequately and effectively support the learning and teaching process.

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Appendix

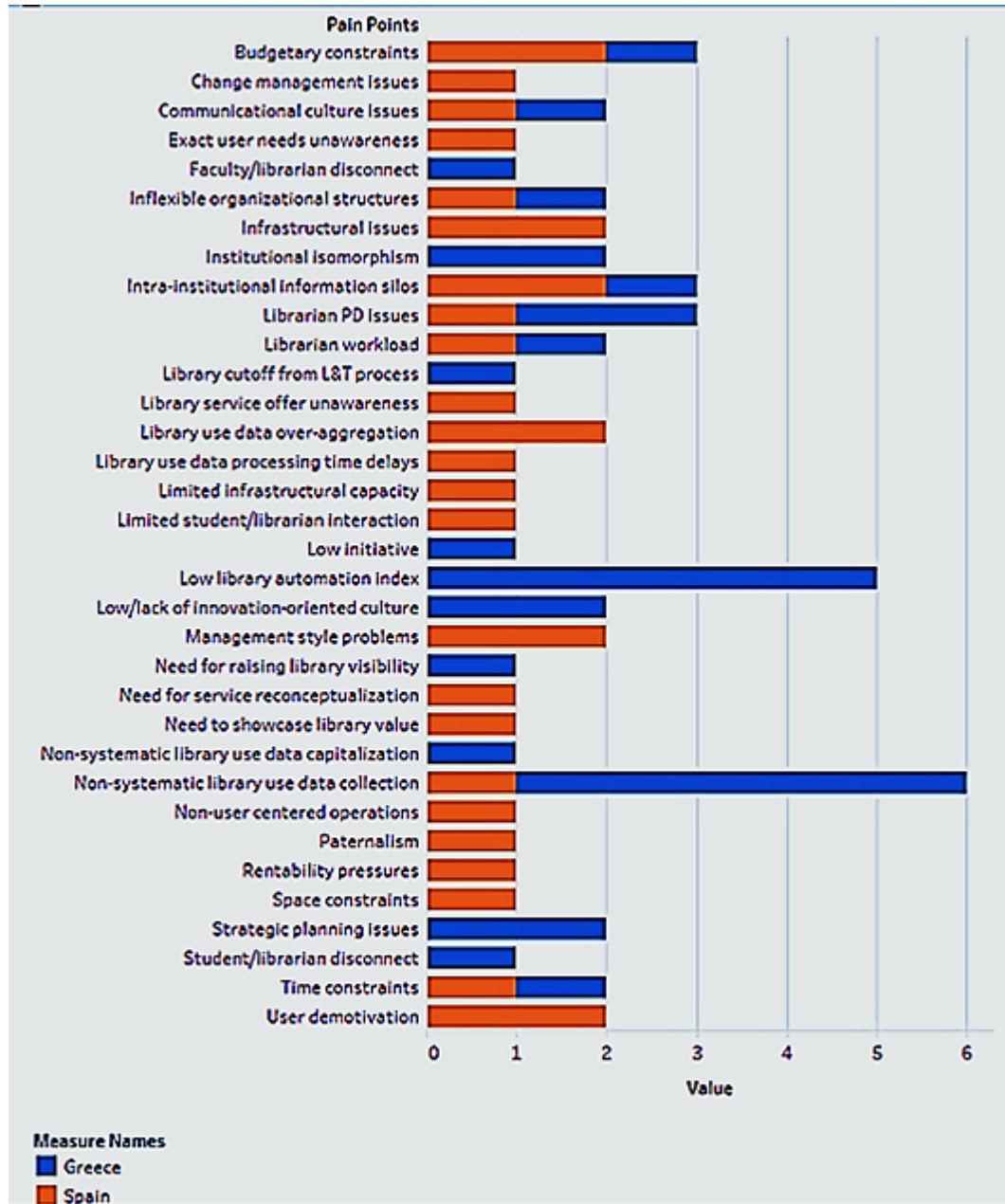


Figure 1. Count of interview emerging codes by country