03 INFORMATIVE BULLETIN

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APPLICATION OF LEARNING ANALYTICS IN LATIN AMERICA

2020 LALA PROJECT

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WELCOME

Application of Learning Analytics in Latin America

Pedro J. Muñoz-Merino, Carlos Delgado Kloos,
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The LALA Project is a three-year project funded by the European Commission by the **Erasmus+** program. The project started in October 2017. The main motivation of the project is based on the lack of use of data to make informed decisions in education in Latin America and the need to take advantage of educational data in the Latin American region. The main outcome of the LALA project is to help improving education in Latin America using learning analytics.

As part of the LALA project, the LALA framework has been created to help Latin American institutions for the adoption of learning analytics. **This framework has four different dimensions: institutional, technical, ethical, and communal.** The LALA framework is adapted considering the needs of Latin America institutions. It includes general steps such as for developing a technical infrastructure; general guidelines and recommendations; template examples such as for informed consent forms; or interview, focus group and survey instruments to collect needs in institutions from different stakeholders. Using the LALA framework, Higher Education Institutions in Latin America can adopt learning analytics solutions.

Based on the needs of the four regular Latin American partners *(two in Ecuador and two in Chile)*, different learning analytics tools developed in Europe have been adopted or adapted to become adopted. **Universidad Austral de Chile** *(UACh)*, **Escuela Superior Politécnica del Litoral** *(ESPOL)*, y **Universidad de Cuenca** *(UCuenca)* were focused on analytics at degree levels and adapted a counselling tool with dashboards which enables tracking students' progress in degrees giving general indicators of courses and advising students in a personalized way. In addition, these three universities adapted an early dropout prediction system to predict dropout in degrees. On the other hand, **Pontificia Universidad Católica de Chile** *(PUC)* was focused on analytics in specific courses in digital platforms and created a tool with dashboards to track student progress in specific courses including e.g. self-regulation learning information and to detect dropout in courses instead of degrees. Finally, other tools such as **On-Task** have been used or will be used in some of the partners.

All four regular Latin American partners have done pilots of the adapted tools, including students, teachers, and managers. Different instruments are used to evaluate the pilots such as the logs of the platforms, surveys, or interviews. Results of the pilots include outcomes about usefulness, impact, and effectiveness of the tools. The results of the pilots are serving to refine the LALA framework and the learning analytics tools.

A Latin America community for learning analytics has been created where Latin America institutions can join for just receiving information or to apply the developed framework and tools. It is expected that at least four additional institutions in Latin America that are not regular partners can use the tools of the project and make pilots.

CONTENTS

This project conforms to the priorities established for Latin America within the so-called Erasmus Plus Project for capacity development; and, in particular, “Improvement of the management and operation of Higher Education Institutions” and “Quality assurance processes and mechanisms”, since this project seeks to create local capacity in Latin American HEIs to design and implement Learning Analytics tools.

Universidad Austral de Chile

PILOTING LALA

Eliana Scheihing, Valeria Henríquez, Julio Guerra,
Cristian Olivares-Rodríguez, Henrique Chevreux.

As part of the activities and tasks of the LALA project, the partner institutions have been pioting different **learning analytics tools** they have developed and adapted. Prior to pilot, each one of the latin american partner institutions detected needs with the help of recommendations of the LALA framework, and then adapted tools ***(dashboards)*** mainly designed by KU Leuven ***(European University that is partner in LALA)***. Details of these activities are available in the project web page.

Pilots has been coordinated by the team at **Universidad Austral de Chile** *(UACh)* with the help of **Universidad Carlos III de Madrid** *(UC3M)*. Piloting mainly run on 2019, with real users and in real use contexts. To achieve this, pilots followed a design on five phases: **preparation, agreement, training, use** and **improvement**. These phases allowed a context adaptive process and a common progress record approach, allowing to do a datailed analysis of the experiences.

Pontificia Universidad Católica de Chile

The piloting process started in 2018, in **PUC** with the pilot of the tool **NoteMyProgress**, which is a web app supporting students' self-monitoring of the learning activities in an online course. NoteMyProgress visualizes interaction between students and the course materials during study sessions, review grades, and set up weekly learning goals.

Universidad Austral de Chile

During 2019, **UACh** piloted the tool called **TrAC**, a tool inspired in the **dashboard LISSA** *(designed by KU Leuven)*. TrAC visualize academic information of a student on top of the structure of the academic program the student is enrolled in. The tool aims to assist program directors in taking decisions regarding special requests on course registration or dropout that students make every term.

PROJECT WEB PAGE

https://www.lalaproject.org/es/entregables/

During 2020, the pilot phase will conclude with the transfer of these experiences to four other Latin American institutions, which will complement the initial pilots and a set of good practices and lessons learned that support the adoption of these types of tools in other Latin American institutions.

Escuela Superior Politécnica del Litoral

In **ESPOL**, the system used for academic advice was improved with three visualizations. The first one shows the performance of each student in the courses taken each semester, using a peer comparison also inspired by **LISSA**. The second offers a simulator of the subjects to be taken in the semester, which includes the student's weekly load and the level of difficulty, and the third one addresses the historical performance of the student

Universidad de Cuenca

Universidad de Cuenca is currently piloting the tool called **AvAc**, which is also inspired in **LISSA**, and allows student advisors to visualize the academic trajectories of students for counseling purposes. The tool contains three visualizations summarizing progress and performance of the student.

TOOL - OnTask

YI-SHAN TSAI

LALA MEMBER

Research associate at the School of Informatics at the University of Edinburgh, with an affiliation to the Centre for Research in Digital Education. She has worked on multiple large international research projects on learning analytics and blended-learning. Her research interests span from learning analytics and digital storytelling to reading cultures and multimodal texts. She is currently an executive member of the Society for Learning Analytics Research *(SoLAR)*.

THE UNIVERSITY of EDINBURGH

¿What is OnTask?

OnTask is a tool that assists teaching staff to provide timely, personalized and actionable feedback to students at scale. The **University of Edinburgh** works with **Rural Federal University of Pernambuco** *(Universidade Federal Rural de Pernambuco—UFRPE)* in Brazil on the piloting of OnTask. The lead researchers are Dr Yi-Shan Tsai *(Edinburgh)* and Dr Rafael Ferreira *(UFRPE)*. A particular interest of this initiative is to support learners and teachers to develop digital feedback literacy in technology-mediated learning environments.

The first step was to understand existing feedback experience and the general appreciation of feedback in learning among learners. A survey tool was thus developed to enable this investigation before OnTask was introduced to the classroom. The survey was designed based on feedback models proposed in key literature *(Butler & Winne, 1995; Nicol & Macfarlane-Dick, 2006; Hattie y Timperley, 2007; Pardo, 2018)*. The survey contains 23 questions that are measured by a 7-point Likert scale and 3 open-ended questions. The survey was distributed among students from two undergraduate courses at the Computer Science Department. A total number of 60 students received an invitation to participate in the survey, and 36 *(31 male; 5 female)* responded to the survey *(response rate=58%)*. The respondents were aged between 17 and 47 *(n=36, M=25.47, SD=7.45)*.

¿WHAT IS ON-TASK?

OnTask is a tool that assists teaching staff to provide timely, personalized and actionable feedback to students at scale.

RESULTS

The results show that the students were generally very positive about their feedback experience and the role of feedback in learning. The average rating scores of the questions are between 4.97 *(Q23. Automation)* and 6.78 *(Q21. Usefulness)(Figure 1)*, and the standard deviation is between 0.48 *(Q21. Usefulness)* and 2.10 *(Q5. Connect goals)*. Both of the highest rated statements are regarding the role of feedback in learning: **"I tend to find feedback useful"** *(Q21, n=36; M=6.78; SD=0.48)* and **"Feedback is an important part of learning"** *(Q22, n=36; M=6.75; SD=0.92)*. The third highest rated statement shows student appreciation of the relational dimension of feedback in the learning process: **"The course feedback that I have received makes me feel that my instructor cares about me"** *(Q17, n=36; M=6.61; SD=0.80)*. The three statements that received the lowest average ratings are: **"I think automation can enhance the feedback process"** *(Q23, n=36; M=4.97; SD=1.48)*, **"I tend to set up my own goals for course tasks"** *(Q18, n=36; M=5.56; SD=1.27)*, **"The course feedback that I have received helps build my self-confidence"** *(Q9, n=35; M=5.57; SD=1.31)*.

The results also show that variation in the response to Q23 is the second highest *(Figure 1)*, which makes it clear that the students were not very confident about automation in terms of enhancing feedback practice. The highest variations are observed in the responses to the three statements: **"I can connect the course feedback that I have received with the desired goals (standards) of my course tasks"** *(Q5, n=36; M=5.6; SD=2.10)*, **"I think automation can enhance the feedback process"** *(Q23, n=36; M=4.97; SD=1.48)*, and **"The course feedback that I have received helps build my self-confidence"** *(Q9, n=35; M=5.57; SD=1.31)*. It appears that the degree to which students were able to use the received feedback to work towards the desired goals varies. It could be that the **"feeding up"** element was not present in the feedback or that students struggled to interpret this element. As respondents gave a comparatively high rating to the statement, **"The course feedback that I have received is easily understandable"** *(Q4, M=6.56; SD=0.81)*, further research is required to identify elements present in the feedback that students receive and explore how students make sense of the received feedback. It is also worth noting that while existing feedback practice makes students feel appreciated *(Q17)*, the extent to which the provided feedback has successfully improved self-efficacy varies by students *(Q9)*. Both findings indicate variations in feedback literacy among learners.

ON-TASK
https://www.ontasklearning.org/

SURVEY
http://bit.ly/ontask_presurvey

ANALYSIS

BOX PLOTS OF RESPONSES

The boxes denote interquartile range (IQR), whiskers 1.5 times IQR, black bars indicate medians, and circles outliers. Whiskers are capped by minimum or maximum data values.

This small-scale pilot study shows that views about automation were polarised among the students. In addition, the observed variations in the perceptions of being able to connect feedback with set goals *(Q5)* and being able to build up self-confidence with the received feedback *(Q9)* indicate that feedback literacy varies among learners.

Our next step is to distribute the survey to a wider student population and identify ways to use OnTask to facilitate dialogue and build rapport between students and instructors, as the comments from the students show concerns about losing the affective aspect of feedback in an automated process. In addition, we will develop training to develop digital feedback literacy among both students and teachers.

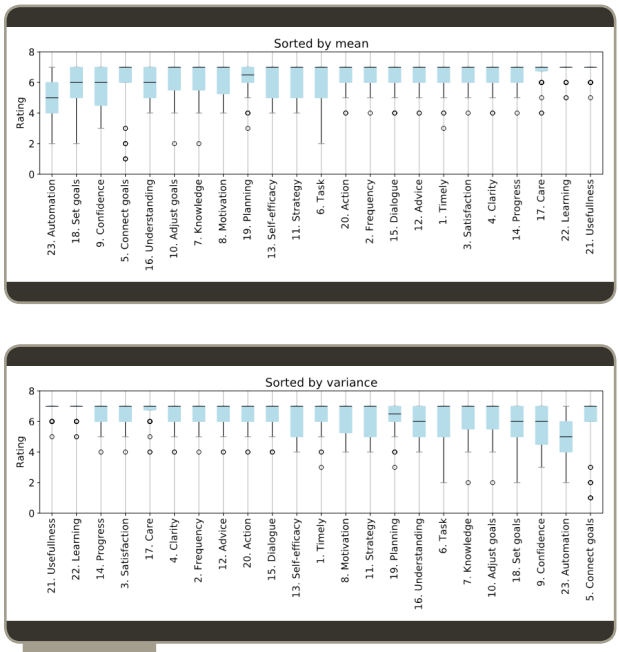

Fig. 1 Results of the survey carried out.

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Escuela Superior Politécnica del Litoral

IMPLEMENTING LEARNING ANALYTICS FOR AN ACADEMIC COUNSELING SYSTEM

AN EXPERIENCE IN ESCUELA SUPERIOR POLITECNICA DEL LITORAL

Margarita Ortiz, Alberto Jiménez.

In **ESPOL**, academic advising is given using a system since 2013, with the purpose of giving the student security in their process of integral formation, detecting their strengths or academic needs, providing effective solutions, through the timely accompaniment using the Academic Advising. This process of accompaniment and monitoring is done from the student's entry to the university until their graduation. The advising is done twice each semester: one week before the registry, and the other after the first evaluation *(middle of the semester), and each session lasts 15 minutes*.

PHASE 1: Baseline information

In 2017 and 2018, a gathering of information about necessities related to learning analytics in **ESPOL** was made, as part of the **LALA project**. The result was the need of improving the actual system of advising. After the gathering of technical requirements that involved approximately **40 students** in an iterative process of the design of the system, 3 new visualization windows were developed.

Inside the phase of the pilotage, we began with a pretest of 175 advisers related to the actual perception of the teachers of the adiving system.

After the training, and once the teachers used the system, we proceeded to gather post-test information throughout the month of May to compare and contrast perceptions. It should be noted that in our case, we could not pilot only a sample of the target group but we had to scale and apply it to the entire university. This happened because as the system is already used throughout the university, any changes made to the system had to be applied to everyone.

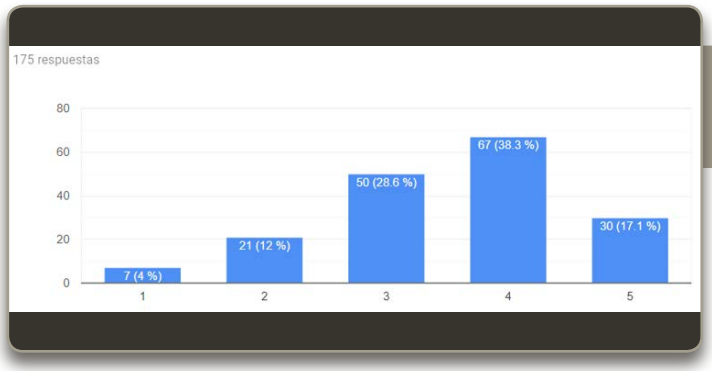


Fig. 2

Pre-test Results

PHASE 2: Agreement Report

152 directors signed an agreement through an electronic method, where it was mentioned what would be done with their data and who will have access to them. It was done during the training and voluntarily.

PHASE 3: Training Report

The trainings were from April 9 to 12, 2019 during the following hours: 09h00-10h00, 10h30-11h30, 14h00-15h00 and 15h30-16h30 attended by 187 counselors During the training the teachers completed a 3-item knowledge test open to find out if they learned to use the tool and a **System Usability Scale** ***(SUS)*** where satisfaction was evaluated from 1 to 5 in relation to the new visualizations ***(sections)*** within the counseling system..

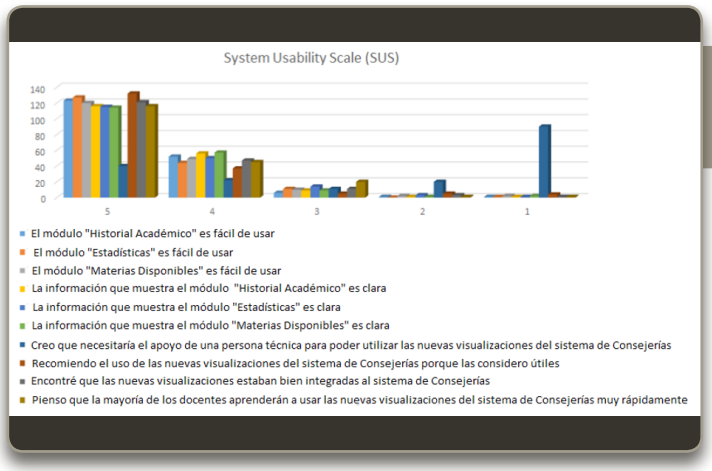


Fig. 3

Results of the Usability Scale (SUS)

PHASE 4: Use Report

The new visualizations were available during the first semester of 2019 reaching 315 counselors and 7714 students in that period. The most used window was the one with Available Materials which indicates that the advisors used the system for the purpose of the counseling sessions within this module; the section with the most frequency of use is the one where the user can visualize the hourly load of the selected subjects; this allows the student to obtain a better selection according to their abilities.

PHASE 5: Evaluation and Improvement

After the training, 128 counselors completed a post-test with a likert scale between 1 and 5 on satisfaction with the new visualizations, as well as an open question to quantitatively support the previous answer.

In addition, based on the oral and written feedback (SUS) that the directors mentioned in the trainings, a first improvement report was made to present to the competent authority, and, based on the pre-post test results and logs, a second improvement report will be submitted to the competent authority.

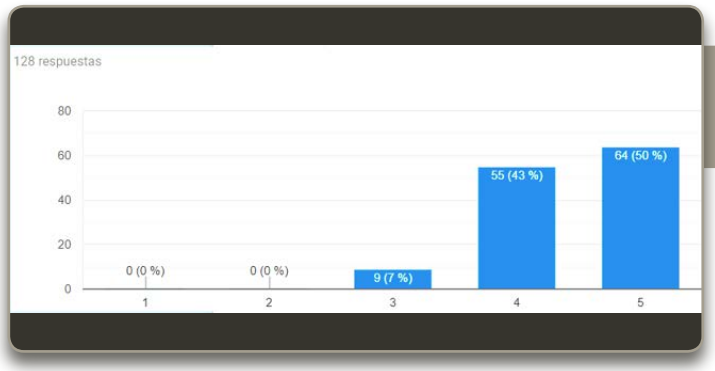


Fig. 4

Post-test satisfaction survey results

Learning Analytics in the Engineering School of Pontificia Unviersidad Católica de Chile

Mar Pérez-Sanagustín, Isabel Hilliger,
Ronald Pérez-Álvarez, Jorge Maldonado-Mahauad.

Learning Analytics capacity development, a challenge for institutions

The development of **Learning Analytics** *(LA)* capabilities in Higher Education institutions is a challenge. On the one hand, the institution requires the technological infrastructure to adapt and / or develop LA services. On the other hand, the institution needs an organizational structure to design and implement new processes in order to ensure the adoption of these services. There are two different approaches to develop the necessary infrastructure and organizational structure. One is to follow a **top-down** process, in which the leadership of the LA initiative is mainly driven by institutional managers, who provide the necessary means. Another is from the **bottom up**, where the initiatives are directed by the basic teaching staff, such as teachers or students, without involving the institutional managers.

Although in recent years Latin America has made great efforts to integrate LA services in its institutions of higher education, experiences in this area are still scarce in the region. In order to provide an example that can serve other institutions as a basis for the development or adaptation of LA services, this article presents how two LA initiatives have been developed by the **School of Engineering of the Pontifical Catholic University of Chile** *(UC-Engineering)*, one following a ***top down*** process and another ***bottom up*** process.

LA to support continuous curriculum improvement processes: a *top down* approach

In 2007 and 2011, after a strategic institutional decision, UC-Engineering decided to accredit its programs according to ABET quality standards, an international accreditation for engineering schools. Five of the eleven engineering degrees were accredited during this period. In 2015, one of the requirements imposed by the ABET agency was to carry out a continuous improvement process to renew the accreditation of these programs, providing evidence of how data on the achievement of competencies are used to improve the curriculum and practices of teaching at the program level.

To facilitate the accreditation process, the Office of Undergraduate Studies and the Engineering Education Unit designed a process to collect data on the achievement of student competencies. This process consisted of supporting the teaching staff in creating their evaluation plans to measure the achievement of their students' competencies at the course level. These measurements would serve to analyze the possible improvements of the course in program meetings where managers and teachers were involved *(Hilliger et al, 2019)*.

As a starting point, the evaluation plans and the results of the acquisition of skills were stored in Dropbox folders. However, the collection of assessment tests became an overwhelming task for teachers, and the analysis of the data collected was difficult to analyze for the program meetings. To alleviate this process, the Director of the Office of Undergraduate Studies decided to invest in an LA tool. This tool was called a **Continuous Improvement** tool, and its design aimed to facilitate the storage of evaluation tests, evaluation plans and the results of the acquisition of competencies, as well as providing visualizations of the acquisition of competencies for meetings of the Program.

Technological and organizational infrastructure an LA service for continuous curricular improvement

As a technological infrastructure, the C**ontinuous Curriculum Improvement** tool was developed. This tool was not developed from scratch, but was implemented from an existing tool designed by an Australian university. For its adaptation, the Engineering Education Unit collected data from 25 professors and 51 students affiliated with the university in order to identify the needs and functionalities required for such a tool. The qualitative analysis of the data collected resulted in a list of functionalities and interfaces that had to be included in the tool. An external Chilean company was in charge of the development.

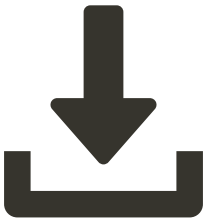
The first version of the tool included visualizations that allowed teachers and students to have a vision of the competences achieved by students at the course level *(Figure 5)*. This was evaluated with 124 teachers in 96 sections of the accredited courses. The results showed that this tool was valued very positively to collect evidences about their courses and that the proposed automatic visualizations helped to have a more complete vision on the competences acquired by their students in the courses. Today, the tool is installed on a university server to deploy pilot tests in courses that will be accredited in the coming years.

Fig. 5

Visualization of the LA tool for Continuous Curriculum Improvement proposed by UC-Enginotecnia. This tool offers visualizations about the scope of student competencies in a course

The development and evaluation processes of the tool required the participation of different UC-Engineering actors: *(1)* The Director of the Undergraduate Office, *(2)* the director of the Engineering Education Unit, *(3)* Two heads of project of the developer and *(4)* teachers and students involved in the evaluations. Since this process arose from the Director of the Office of Undergraduate Studies, and was led by a member of the Engineering Education Unit, the actors involved in the early phases of the LA initiative were senior ***(mainly managers)***, while the highest level actors participated in the process of design and evaluation of the initiative

Challenges of a *top down* process



Several challenges were encountered during the development and implementation of the **Continuous Curriculum Improvement** tool. Regarding to technological infrastructure, the most challenging aspect was the integration of data from different sources into the tool. In order to obtain automated reports on the achievement of student competence, the tool had to integrate the partial grade of the course with the enrollment of the course, in addition to linking manual parameters that indicated which partial grades indicated the learning outcomes for a specific competence.

During their implementation, the managers had to perform several validations to compare whether the data in the report reflected the results of the achievement of competencies the professors hoped to visualize in the program meetings.

Regarding the organizational structure, the School of Engineering and the Office of Undergraduate Studies had to find the mechanisms to integrate the use of the LA tool as part of the existing processes to avoid the teaching workload. Since the implementation of the LA tool responded to a ***top-down*** initiative, the teaching staff was reluctant to perform additional tasks to those already performed to assess the achievement of skills and learning outcomes in their courses. To do this, the managers of the Engineering Education unit trained assistant professors on how to use the tool in order to support the teaching staff to load the information required for the international accreditation process.

LA to support learning in Open Massive Online Courses: a *bottom up* initiative

In 2015, UC-Engineering launched the **UC Online** initiative. This initiative aims to create open online courses *(MOOC)* for the Coursera platform and digital content to transform traditional teaching-learning practices. As of this initiative, UC-Engineering currently has more than **17 MOOCs** and more than **400,000 registered students**. In addition, several projects have reused MOOCs as a complement to the courses of the curriculum *(Pérez-Sanagustín et al., 2017; Hernández et al, 2019).*

Following this initiative, the school began to collect a large amount of data on students from around the world, from demographic data to their interaction with online resources. This large volume of data was seen in the institution as an opportunity to launch LA research initiatives, aimed at improving the experience of students in these new digital learning environments. In this context, a group of UC-Engineering researchers proposed a project to support students' study strategies in digital learning environments, in order to improve student engagement and performance in MOOCs. This project was funded by the **Chilean National Science and Technology Commission** *(CONICYT)* between 2015 and 2018. One of the results of the project was the **NoteMyProgress** *(NMP)* tool *(Pérez-Álvarez et al., 2018) (Figure 6)*, an LA tool to support student self-regulation strategies in online environments automatically and in a personalized way. Through interactive visualizations, it provides aggregated actionable information about the student's activity in the online course and its interaction with its contents. The objective of this tool was to promote students' reflection on their learning strategies, motivating informed decision making to improve their performance.

Fig. 6

Image of the NoteMyProgress tool. This tool offers automatic visualizations to promote student learning strategies in a MOOC.

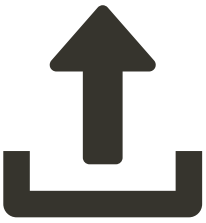
Technological and organizational infrastructure an LA service for continuous curricular improvement

The development of NMP was carried out by a software company specialized in visualizations and coordinated by one of the researchers of the team involved in the **CONICYT** project. For the development, the researchers followed a research approach based on the **Interactive Learning Design** *(ILD)* designed by Bannan *(2003)*. This framework organizes the development of the tool in an iterative process in which the requirements of the tool are defined after an informed exploration phase.

This phase consisted of a review of the literature of the works that developed tools to support self-regulation in online environments. In accordance with the requirements identified in this phase, a first version of the tool was designed and implemented on a local server of the company involved in the development.

This first version was evaluated locally in one of the MOOCs of the UC-Engineering to identify usability and functionality problems. The conclusions of this evaluation were used to design a second version of the tool. This second version was installed on a UC-Engineering web server and was deployed in three MOOCs that were part of the UC-Engineering online initiative at that time. Three researchers conducted a pilot study to analyze the impact of the tool. The entire development process lasted one year, and the analysis of the data resulted in a report summarizing the main results of the project. The infrastructure involved in this initiative was: *(1)* an external local server to host the first version of NMP; *(2)* a web server in UC-Engineering to install the second version, and *(3)* a Google Apps account to upload the latest version of the tool and make it available to end users.

Challenges of a *bottom up* process



During the process of developing and deploying the NMP tool, the research team encountered two challenges: deployment and pilot testing of the tool. As for the technological infrastructure, the implementation of the tool at the university level required the coordination of the technical team of the university through the leader of the training of engineers.

This step required meetings to convince intermediate managers that the testing of an innovative initiative could lead to potential benefits.

Regarding the organizational structure, the researchers who participated in the project were already familiar with the potential of LA services. However, for senior managers and teaching staff to be aware of how the NMP tool could affect student performance, empirical evidence of the tool's potential was required. In fact, the research team continues to work on new versions of the tool, in order to facilitate its incorporation into institutional processes.

LEARNED LESSONS

From the two approaches raised, UC-Engineering extracted the following lessons learned:

- **First**, it is important to combine the *top down* and *bottom up* approaches to facilitate the participation of the various actors during the design and implementation of LA services. In the *bottom up* approach, the base staff played a key role during the design process, providing feedback to the developers of the tool regarding their needs and preferences. In contrast, in the *topdown* initiative, senior managers played a key role during the incorporation of the tool into an existing academic process, managing resources and training to involve teaching staff.
- **Secondly**, it is important to anticipate the need for servers and spaces for data storage that allow integrating information from different sources and existing services in the institution. The *bottom up* initiative required moving the NMP tool to a university web server, while in the *top down* initiative, data integration and validation was crucial, despite being internal systems to the institution.
- **Finally**, it is important to disseminate the potential that LA tools could have to address institutional needs, in addition to building the necessary experience to organize, clean and manage educational data responsibly.

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LALA IN EVENTS

Isabel Hilliger, a LALA member, participated in a workshop held for the Autonomous University of Nuevo León *(UANL)* in Monterrey, Mexico, called **"Learning Analytics and Artificial Intelligence to improve the quality of Higher Education"**.

Rafael Mello had presented about the LALA project during the I**nternational Conference on Advanced Learning Technologies and Technology-enhanced Learning**. During the event, that took place in Brazil, Rafael shared the initial results of the adoption of LALA framework at the Federal Rural University of Pernambuco.

Valeria Henríquez, Henrique Chevreux and Julio Guerra unveiled at **EC-TEL 2019,** the tool called **TrAC** *(Curriculum Academic Path)*, one of the learning analytics tools developed in the framework of the Project LALA. They presented a poster and a demo *(examples of its implementation and its possible uses)*.

Margarita Ortiz, a member of the **LALA-ESPOL** team presented the results on an iterative methodology to develop learning analytics tools at the conference **LACLO 2019**, Latin-American Community of Learning Objects, held in San José del Cabo, Mexico.

The members of LALA organized a workshop to support the configuration of the research line **eXplainable Learning Analytics** *(XLA)*, at the **EC-TEL 2019** conference. In this workshop, the participants explored the challenges and opportunities related to data, stakeholders, communication, evaluation, as well as the implementation and adoption of XLA.

LALA team members developed the **Workshop on Learning Analytics for Management in Higher Education Institutions** (HEIs) within the framework of the Congress on Information and Communication Technologies – **TICEC 2019.** In this workshop, an introduction to the concept of learning analytics was made, as well as, the **LALA Framework** and its different dimensions.

Regional meeting of capacity building projects was developed under the field of Higher Education of **Erasmus+** projects implemented in Ecuador, Peru and Colombia. LALA team members from Escuela Superior Politécnica del Litoral and Universidad de Cuenca announced the LALA project to the representatives of the other projects attending the event.

Jorge Maldonado, Coordinator of the Learning Analytics Community in Latin America, LALA, provided training in the topic of **Learning Analytics** to professors and researchers of the IDEClab of the **Universidad de Concepción**, Chile.

KU LEUVEN

KU LEUVEN FOR LEARNING ANALYTICS AT SCALE

SCALING UP DASHBOARD TO THE INSTITUTIONAL LEVEL

Katrien Verbert, Tinne De Laet, Tom Broos, Martijn Millecamp.

Within two European projects preceding the LALA Project –**STELA** ***(Successful Transition in Education using Learning Analytics)*** y **ABLE** ***(Achieving Benefits from LEarning analytics)***– four bottom-up learning dashboards were created that aimed at supporting the interaction between student advisor and students and self-reflection of students ***(Figure 7)***. **LISSA** ***(Charleer et al. 2018)*** was designed to support the conversation between student advisor and students based on an intensive user-centred design project. To support the self-reflection of students, three self-serving dashboards were designed and deployed: **LASSI** around learning skills ***(Broos et al. 2019)***, **REX** around academic achievement ***(Broos et al. 2019)***, and **POS** for aspiring students ***(Broos et al 2018)***. These dashboards were the result of a strong collaboration between a multidisciplinary team of researchers and practitioners. At the end of the project the dashboards were piloted in 26 programs within KU Leuven, reaching more than 4000 students and 120 student advisors.

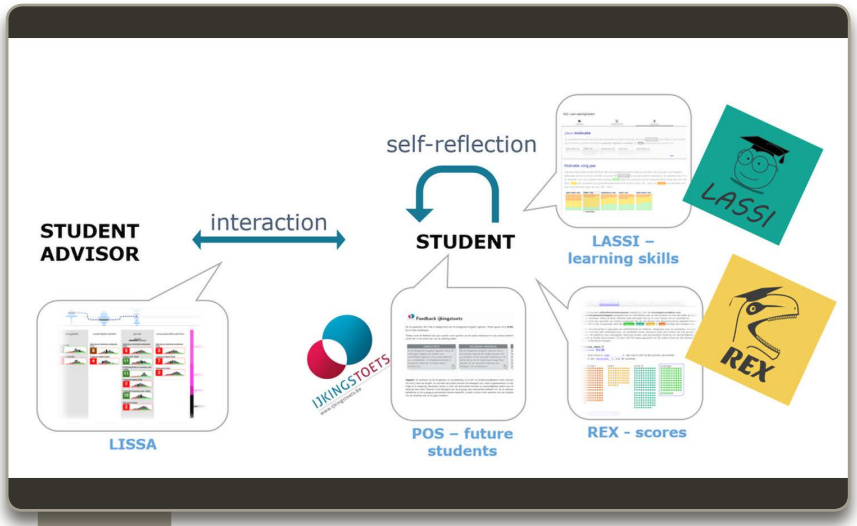

Fig. 7

Overview of the learning dashboards at KU Leuven developed within two European projects: STELA and ABLE. The dashboards support the interaction between student advisor and student and self-reflection.

POLICY "GOING DIGITAL"

https://www.kuleuven.be/english/about-kuleuven/strategic-plan/going-digital

While the learning dashboards were piloted at a large scale, strongly supported by student advisors and students, and well-received by KU Leuven policy makers, the project struggled for continuation and embedding in actual university practices and processes. At the same time, and inspired by the experience of the learning dashboards and other innovative projects struggling to scale to an institutional level, KU Leuven policy makers elaborated a policy around educational technology named **"Going Digital"**. This policy aimed at using educational technology such that it facilitates collaborative learning and multi-campus education and broadens the international reach. The policy plan also named ten short term goals, including the scaling up of the developed learning dashboards.

The policy plan was later translated to a strategic plan that provided concrete stimuli to realise educational technology, including project financing. The project financing is built around three phases, inspired by well-known maturity models: **1) the innovation phase** to stimulate innovative bottom-up initiatives, **2) the scaling-up phase**, relying on a strong collaboration with institutional services *(IT, educational policy, student services, educational support services, ...)* to analyse if and how the best bottom-up initiatives can be scaled up, and **3) the actual upscaling and anchoring** of the initiatives. The four dashboards created and piloted in the **STELA** and **ABLE** projects were selected as the very first scale-up project.

This policy plan and the specific learnings of applying it on learning dashboards may inspire Latin American universities to obtain Learning Analytics at scale.

STELA

The main goal of the project was to enhance a successful transition from secondary to higher education by means of learning analytics. To this end the project developed, tested, and deployed a learning analytics approach that focuses on providing formative and summative feedback to students in the transition.

https://stela-project.org

ABLE

The ABLE Project will research strategies and practices for using learning analytics to support students during their first year at university. The work will focus on both developing the technological aspects of LA and, more importantly, on how it can be used to actually support students.

http://www.ableproject.eu

Scaling up learning dashboards internationally

Student advising and counselling is an essential part of student support during the first years of higher education. The actual advising practices differ a lot between institutions, both regarding the methods used, people involved, embedding in university practices, and maturity. Data-supported advising has the potential of increasing the advising quality and the support provided to individual advisors, and therefore has gained interest.

Within the LALA project, the **LISSA dashboard** *(Charleer et al., 2018)* that supports the interaction between students and student advisors, successfully developed by and deployed at KU Leuven in Belgium, was adapted and adopted in three Latin American universities *(Cuenca and ESPOL in Ecuador and Austral in Chile)*. The process of the adaption and adoption is showcased in the video, reachable using the QR-code on the right. The project team found that the local context can heavily influence the adaptations. New modules, tailored to the needs of the particular institutions were developed *(modules related to drop-out prediction, peer-comparison, course registration, ...).*

¿How to scale up an implementation and build a Learning Analytics policy at the same time?

One of the learnings of the LALA project is that Latin-American institutions struggle with implementing **Learning Analytics** *(LA)* projects at scale. Several studies provide guidance on the necessary development of LA policies, but institutions encounter difficulties to put the advice into practice in a context with resource constraints, limited availability of legal frameworks, and institutional maturity in data processing.

Previously, the KU Leuven team experienced first-hand that a lack of coordination between policy-building and implementation can act as brake on the realization of LA at scale. In the context of the LALA Project, Universidad de Cuenca and KU Leuven experimented with an alternative approach, where the development of LA policies and an implementation project of actual LA dashboards coincided in time. This led to new questions about how these two parallel paths can be coordinated in an efficient way.

In a workshop that took place in Valdivia, Chile, sixteen experts from the different **LALA Project** partner institutions gathered to obtain a mapping of the fine-grained item level of the **SHEILA Framework** *(Tsai et al., 2018)* with the four common implementation phases defined in the project: initializing, prototyping, piloting and scaling.

The processing of this exercise is work in progress, but first results are promising. The goal is to share a coordination model that complements the existing LA policy building frameworks with a pragmatic approach leveraging simultaneously ongoing implementation efforts.

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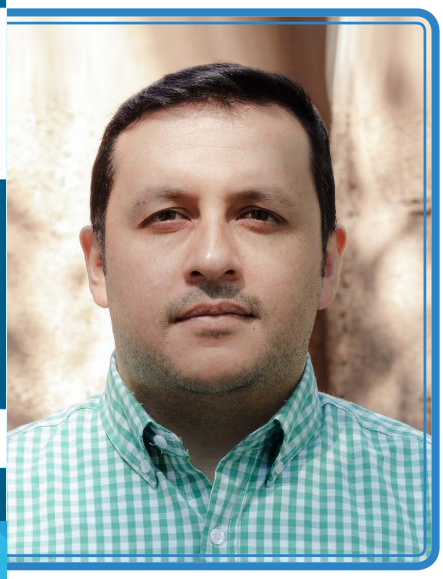
LA COMMUNITY

THE LALA COMMUNITY

2 YEARS PROMOTING LEARNING ANALYTICS IN LATIN AMERICA



JORGE MALDONADO

COORDINATOR OF THE LEARNING ANALYTICS COMMUNITY IN LATIN AMERICA

Associate Professor of the University of Cuenca. Doctor of Engineering Sciences *(Computer Science)* since 2019 from the Pontifical Catholic University of Chile. His research interests are related to MOOC´s, Self-regulated Learning, Blended Learning, Process Mining and Learning Analytics.

The area of Learning Analytics *(LA)* has been developed extensively in the Anglo-Saxon countries, being the US, UK, Canada and Australia where the main contributors to this area are located. His contributions in the area have been presented at the most important conference, which is the **Learning Analytics & Knowledge Conference – LAK**, which has been developing since 2011.

In Latin America, while teaching and learning processes have begun to be measured and optimized through LA; existing attempts in this direction are highly isolated given the lack of a regional community that encourages the exchange of local ideas, methodologies, tools and results in the field. This is evident from a review of the literaturze developed by dos Santos et al. *(2017)*, where the small contribution made through scientific articles written by Latin American researchers to the LAK conference is laid down.

The first contribution recorded by Latin American researchers to the LAK Conference was made in 2011. As of this date, there have been 3 contributions in 2013, 6 contributions in 2014, 18 contributions in 2015 and only 2 contributions in 2016. All contributions were written in English, which gives little visibility of the work done to the Latin American community. On the other hand, from a questionnaire that was disseminated through email lists, social networks and academic networks in 2016, about 28 research groups working in the LA area could be relieved, identifying 20 groups in Brazil, 5 in Colombia and 1 group in Chile, Mexico and Paraguay.

COMMUNITYRESULTS

As a result of these 2 years, 2 Latin American conferences have been organized, bringing together about 130 researchers, 65 articles received, 2 summer schools and more than 10 training workshops on different topics related to LA in various HEIs in the region.

Currently, in Latin America there are two important conferences that attract the attention of researchers from Latin America, these are:

1. **CLEI –** Latin American Computing Conference
2. **LACLO –** Latin American Conference on Learning Technologies.

The first does not currently have a Spanish line on learning analytics and the second from 2017 included for the first time a track in Spanish on learning analytics. These two conferences for the first time in 2018 were organized on a joint, which led to an ideal scenario to bring together researchers, teachers and students interested in working with learning analytics.

For the above, the **Erasmus+ LALA project** saw as necessary the creation of an interdisciplinary community of researchers and institutions in Latin America in Learning Analytics, with the main objective of promoting long-term sustainable cooperation, creating lasting relationships among its members, which contribute to the replication of the results obtained by the LALA project.

This will help the LALA community to promote research and knowledge sharing to develop local capacity in the Higher Education Institutions *(HEIs)* of Latin America to create, adapt, implement and adopt Data Analytics tools to improve academic decision-making processes. In addition, it seeks to promote joint LA activities in The Latin American HEIs *(LAHEIs)*.

It is expected specifically:

1. Be able to build a collaborative space for teachers dedicated to the systematic study of LA;
2. Analyze the state of art of LA in LAHEIs;
3. Replicate good practices and successful experiences in LAHEIs;
4. Formulate management indicators associated with LA in LAHEIs;
5. Promote and organize events to disseminate research results;
6. Promote training and updating activities of HEIs researchers and students, interested in LA;
7. Develop a Latin American LA observatory.

The first steps of the LALA Community

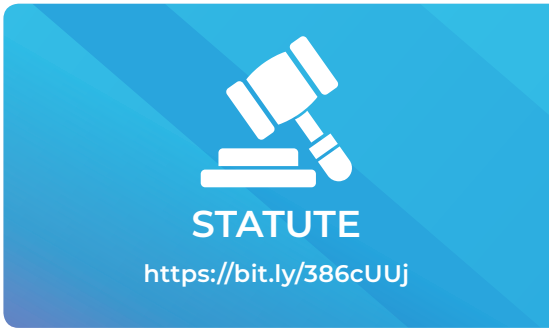
The **LALA Community** was funded at the beginning of 2018 with the 7 members belonging to the consortium of Universities of the **Erasmus+ LALA** project being these: Carlos III University de Madrid *(Spain)*, University of Edinburgh *(United Kingdom)*, Catholic University of Leuven *(Belgium)*, Escuela Politécnica del Litoral and University of Cuenca *(Ecuador)*, Pontifical Catholic University of Chile *(Chile)*, Universidad Austral de Chile *(Chile)*. These institutions are part of the Advisory Committee of the LALA Community, and are responsible for joining the cooperation network to the institutions that so request by means of a letter of accession that can be downloaded from this link:

LETTER OF ACCESSION
https://bit.ly/3camM2u

Institutions that adhere to the community can contribute to the network at two levels:

- **Level 0:** receive related news and important information. They are welcome to meetings.
- **Level 1:** bring knowledge to the community, receive related news and are welcome to meetings.

This is indicated in the community statute which contains the conditions of accession, the operations of the community and can be accessed from this link:



Current State of the LALA Community

216 researchers registered in total

26 countries of Latin America

70 Institutions of Higher Education

Currently the LALA community has **216 registered researchers**, 74% belong to public universities, 22% to private institutions and 4% to other types of institutions such as government.

Researchers belong to **26 Latin American countries** such as: Argentina, Costa Rica, Grenada, Jamaica, Peru, Venezuela, Bolivia, Cuba, Guatemala, Mexico, Puerto Rico, Brazil, Ecuador, Guyana, Nicaragua, Dominican Republic, Chile, El Salvador, Haiti, Paraguay, Suriname, Colombia, French Guiana, Honduras, Panama and Uruguay.

In relation to HEIs, the LALA community has now joined **70 institutions** (*apart from the 7 founding partners)*, who have expressed an interest in being part of this network of cooperation. We hope to reach the 100 institutions before finalizing the project in October 2020.

As part of the **Erasmus+ LALA** project initiatives, the Community has organized the **I** and **II Latin American Conference on Learning Analytics**. The I LALA Conference was developed in Guayaquil-Ecuador, in which 70 researchers from 15 countries participated, 35 research articles were received, of which 15 papers were accepted as complete articles and 10 articles were selected to be presented in a special poster session. In addition, the **first summer school of Learning Analytics** was developed, offering 9 tutorials taught by specialists in the area of learning analytics and was attended by renowned researchers such as Phd. Xavier Ochoa, member of the executive committee of SOLAR. The II LALA Conference was developed in Valdivia-Chile,in which 60 researchers from 9 countries participated, 30 research articles were received, of which 14 papers were accepted as full articles and 5 articles were selected to be presented in a special poster session. In addition, the **second summer school of Learning Analytics** was developed, offering 4 tutorials.

This year, on October 1 and 2, the III LALA Conference will be held at the University of Cuenca-Ecuador in which more than 100 researchers from the area are expected to participate. Also for the first time, I LASI-LOCAL will be developed in conjunction with SOLAR and will open the doors to researchers and institutions in Latin America to the benefits that this agency brings to its members. The I LASI-LOCAL aims to train and train researchers interested in the subject by prestigious exhibitors who are part of the LALA project consortium.

Fig. 8 Promotional banner of the III Conferencia Latinoamericana de Analítica de Aprendizaje y I LASI-Local – LALA 2020.

Finally, during 2019 different types of visits were made to HEIs in Latin America, who expressly requested collaboration to find and invite experts in the area, with the purpose of advising on the adaptation of learning analytics tools, providing training workshops to their researchers and professors and participating as keynotes in various events in the Region. These were the cases of the institutions Universidad Politécnica Salesiana in Ecuador, Universidad de Concepción in Chile, Universidad San Agustín in Peru, Universidad Federal Rural de Pernambuco in Brazil, Universidad Autónoma de Nuevo León in Mexico, Universidad del Cauca in Colombia. As a point to highlight we would like to cite the formation of the Group Learning Analytics Perú, who under the direction of Daniel Navarrete and Andrés Paredes are doing an excellent work of dissemination and literacy in LA throughout Peru.

By this year 2020 we hope to build the **Observatory of Learning Analytics** and the first specialization program on this topic ready.

LIST OF AFFILIATED INSTITUTIONS

https://www.lalaproject.org/es/miembros

SOLAR (Society for Learning Analytics Research)

https://solaresearch.org

III LALA Conference

https://www.lalaproject.org/conferencia2020/

Learning Analytics Perú

https://laperu.org/

FACE-TO-FACE LALA MEETINGS.

EIGHTH COORDINATION MEETING MADRID - ESPAÑA.

The eighth coordination meeting of the **LALA project** took place on October 16, 17, and 18, 2019, in **Madrid – Spain**. The main focuses of this meeting were the piloting and dissemination work packages. All partners presented their advance in the last months since the last face-to-face meeting in Leuven regarding their pilots. In particular, the following topics were covered: **monitoring of the progress of the pilots, analysis, and evaluation of the pilots, agreement on the final document to report the pilots, assignment of tasks and deadlines.**

First day of project activities coordination meeting.

Second day of project activities coordination meeting.

This meeting had a different format from the previous face-to-face meetings since there was more time for bilateral meetings and discussions in groups. Besides, during this meeting, administrative and project management issues were discussed as well as dissemination activities such as training packages and future dissemination actions. The next coordination meeting will be in Leuven, **Belgium,** from **March 19 to 21, 2020.**

Third day of the project activities coordination meeting.

Third day of the project activities coordination meeting.

WORK TEAM

The LALA project consortium is composed of three European institutions and four Latin American institutions. The 3 Europeans are: The University Carlos III of Madrid that acts as coordinator, the University of Edinburgh and the KU Leuven, and the 4 Latin American partners are: ESPOL Polytechnic University and University of Cuenca in Ecuador and Pontifical University and Austral University in Chile.

The LALA project is an initiative of Latin American and European universities to massify the use of learning analytics in the institutions of the Latin American region. The main benefit that this project provides to universities is: to improve the educational quality through the use of the data produced to better understand the process and optimize it.

PARTNERS

uc3m | Universidad Carlos III de Madrid

KU LEUVEN

THE UNIVERSITY of EDINBURGH

Universidad Austral de Chile
Conocimiento y Naturaleza

UNIVERSIDAD DE CUENCA

PONTIFICIA UNIVERSIDAD CATÓLICA DE CHILE

espol

This project conforms to the priorities established for Latin America within the so-called Erasmus Plus Project for capacity development; and, in particular, “Improvement of the management and operation of Higher Education Institutions” and “Quality assurance processes and mechanisms”, since this project seeks to create local capacity in Latin American HEIs to design and implement Learning Analytics tools.

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LALA Project
Building Capacity to Use Learning Analytics
to Improve Higher Education in Latin America