

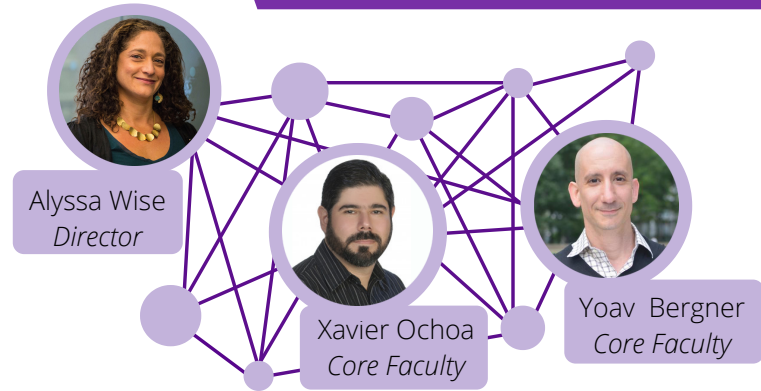
LEARNING ANALYTICS RESEARCH NETWORK

Building an equitable future of data-informed teaching & learning research

What is Learning Analytics?

Learning Analytics is the development and application of data science methods to the distinct characteristics, needs, and concerns of educational data for the purpose of better understanding and improving learning processes, outcomes and environments. It offers a new approach to improving education by enabling better, data-informed, decision-making on a short-cycle real-time basis.

LEARN Leadership



LEARN'S Mission

The **Learning Analytics Research Network (LEARN)** combines deep expertise in advanced data science methods with the careful design and implementation of novel learning approaches in order to promote equitable and effective education for all. By coordinating research and development at the cutting edge of learning analytics, LEARN helps NYU lead the field of education in data-driven and evidence-based innovation for learning in both digital and physical spaces.

1000+

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What is distinct about LEARN's approach to analytics?

LEARN takes a human-centered approach to develop analytic technologies that create equitable opportunities for all students to thrive. LEARN engages in multi-faceted partnerships and institution-wide capacity building to bring together a unique coalition of researchers and practitioners with expertise in computational methods, teaching and learning practices, educational technology design, and societal/policy perspectives. LEARN is an intellectual hub for educational analytic innovation where new ideas for the use of data in online, physical and hybrid learning arise, germinate, and inspire research and action.

LEARN Projects

LEARN's work focuses on the development and study of analytics to support instructors and students in maximizing learning success for all students, whether in online, face-to-face or hybrid learning modes.

Prioritizing Equity in Learning Analytics

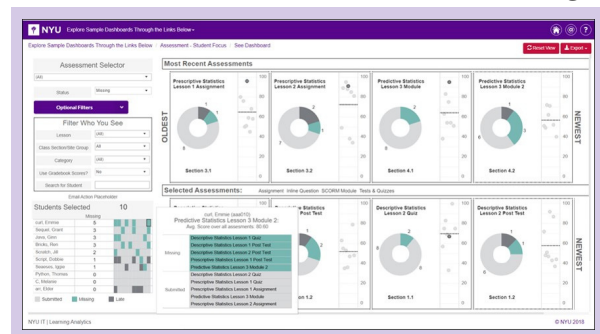
As part of the **STEM Equity Impact Detection** project, LEARN has examined patterns of student enrollment and course performance in the introductory biology sequence to identify differences related to race/ethnicity and biological sex. This work also raises critical questions about the assumptions and limitations inherent in this class of analyses, focused solely on sameness in grade, that may promote a deficit narrative. The project is now exploring the possibilities for other variables to represent both the different opportunities students have had coming into their studies, as well as other outcomes, such as sense of belonging, that have been found to be important predictors of STEM persistence.



LEARN has recently developed the idea of **Subversive Analytics** as a theoretically-grounded means of engaging with the many ways in which issues of power of equity in education interact with the usage of information on learning processes. The work offers a concrete set of critical practices for identifying tacit assumptions about data, asking generative questions about design processes, and considering new modes of creation to produce tools that challenge the status quo.

Teaching with Analytics Online and in the Classroom

LEARN has partnered with the NYU IT Teaching and Learning with Technology (TLT) group on multiple dashboard projects to support teaching, course design and student learning. The **Course Engagement Report**, collaboratively created in rapid response to covid-required remote instruction online in Spring 2020, provides instructors with high level information about how their students engage with online course elements via weekly email. LEARN has also conducted detailed research to study how instructors use the more comprehensive **Instructional Support Dashboards** provided by IT TLT as well as how they can be improved to better serve their needs. This work has generated deep understanding of how instructors make data-informed decisions in their teaching and resulted in tangible contributions to the tool's design and support infrastructure. The **Calculus Early Alerts** project is a partnership with NYU IT TLT and NYU Courant to use predictive modeling to identify students at risk of struggling or failing NYU's introductory calculus classes. This model enables instructors to offer resources and attention targeted to students' specific learning needs early in the semester.



Analytics for Collaborating Virtually and In Person

LEARN is developing a variety of tools to support student interactions online and face-to-face. **CPSX Collaborative Problem Solving Online** is an extension to the Open edX learning management system designed to support synchronous online collaboration on math and science homework problems. Data collected using this platform is analyzed using innovative psychometric models to provide insight into learning. The **F2F Collaboration Feedback** project researches ways to provide

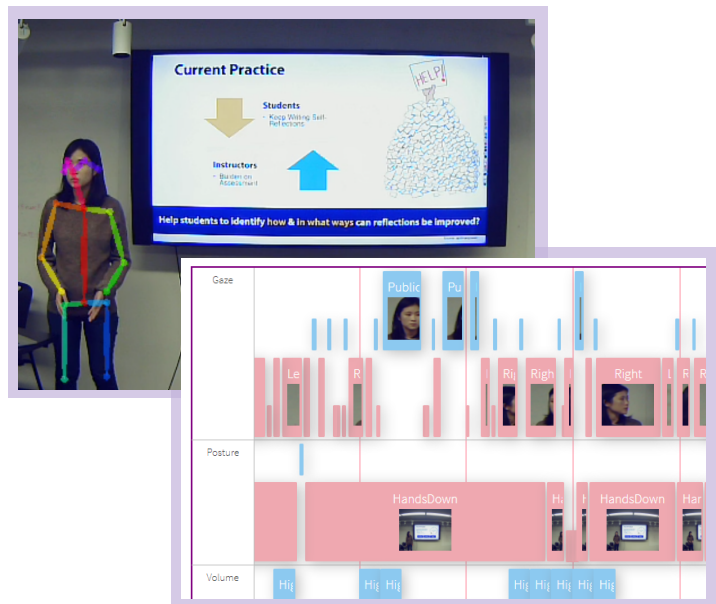


students with live feedback on their collaborative learning activities. It innovates upon the current state-of-the-art in multimodal learning analytics techniques by using computer vision, automatic human-behaviour analysis, speech recognition and natural language processing to estimate different collaboration constructs. In partnership with the NYU's School for Professional Studies, the **Discussion Forum Analytics** project provides online students with weekly feedback on their individual and group team processes.

Analytics in Physical Spaces

LEARN is an innovator in the development of analytics using data collected in physical settings. The **Presentation Feedback Tool** is a low-cost system that facilitates the acquisition of oral presentation skills by using simple sensors, paired with advanced multimodal signal analysis to automatically generate feedback reports that identify issues in an individual's body language,

speech or slides. The Working Group on **Instrumented Learning Spaces**, a collaboration with NYU's Tandon School of Engineering, explores affordances, constraints, and data infrastructure requirements for high-fidelity capture of performance, learning, and collaboration in active spaces such as the Tandon Makerspace. The **Movement Based Learning** project, a collaboration with STEM from Dance and University of Colorado Boulder, examines how to integrate machine learning, data science, and physical computing in the context of movement based learning in dance and cheerleading.



Participatory Analytics Design

LEARN prioritizes engaging with stakeholders in the design and implementation of analytical tools. The **Participatory Practices** project surveys the involvement of instructors, students and others in the co-creation of analytics tools, analyzing and developing ways to have them engage authentically in the design processes that generate learning analytics. In partnership with TLT and the College of

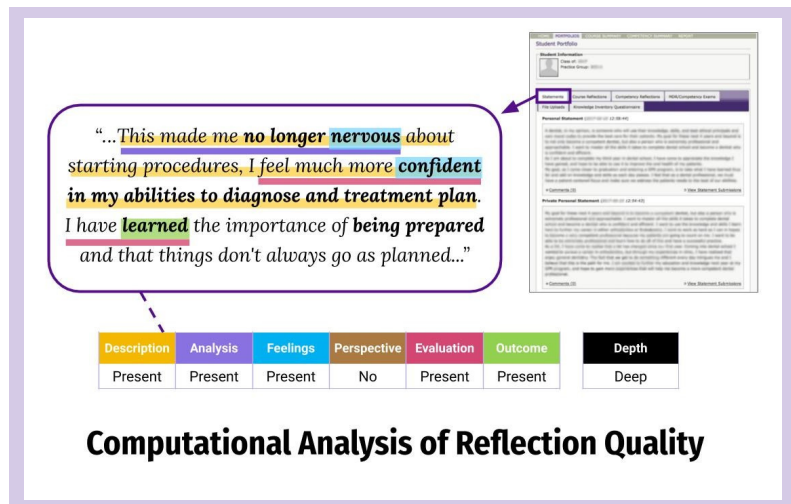


Arts and Sciences, LEARN engaged students in the co-design of a **Student-Facing Learning Analytics Tool** to support their learning, motivation and academic progress. The **Learning with Actionable Analytics** project investigates how students can be co-designers of actionable analytics during the pilot stages of tool design as well as sense-makers and action-takers throughout the implementation phases.

Analytics to Better Understand Student Experiences

LEARN's reflection analytics projects are a collaboration with NYU's College of Dentistry that apply natural language processing techniques to a large corpus of student reflections. Analytics are crafted for a wide variety of purposes. The **Analytic Feedback on Reflection Quality** project addresses a critical gap by exploring the use of learning analytics to provide formative feedback on student reflection activities. The **Tracing Professional Identity Development** project examines dental student reflections as a window into their developing professional identity over time. The

Understanding Students' Exam Attributions project examines student reflections on failed competency exams to understand the attributions students make with the goal of supporting their future learning experiences. LEARN also conducted the **College in the Time of Corona Student Survey** with students across the United States in Spring 2020 to understand how they experienced the rapid shift to remote instruction in response to the COVID-19 outbreak.



Supporting a Growing Learning Analytics Community

LEARN organizes a wide range of events that bring together researchers, instructors, students, technologists and other university stakeholders united with the common goal of building the future of data-informed teaching and learning research at NYU.

Engaging Online Events share the latest developments in learning analytics and offer a forum to discuss pressing issues in the field.

The **LEARN Conversation Series** uses an innovative online format to bring two different perspectives on a key issue together in dialogue. In the recent discussion on Fairness & Equity in Learning Analytics, Drs. Paul Prinsloo and Ravi Shroff explored ways to productively navigate the intersection of learning analytics and equity and consider the role of educational data science as a tool for social justice.



Curated Resource Collections help people interested in learning analytics get up to speed on the latest in the field. As the field continues to grow and new technologies emerge, LEARN aims to provide open and accessible resources for new learners and educators of learning analytics.

Learning Analytics 101 is a free, online resource with informative and timely pieces from leaders in the field on key areas of research, such as predictive modelling, network analysis, text mining, visual learning analytics and dashboards, design in learning analytics, and ethics and equity.



In collaboration with the Learning Analytics Learning Network, LEARN doctoral scholar Juan Pablo Sarmiento facilitated an engaging session on **6 Techniques for Participatory Design of Learning Analytics**. In it, he walked participants through the six concrete methods for creating interactive workshops with educators and students that they could incorporate into their next learning analytics design project.



Interactive Workshops invite participants to engage with learning analytics tools, methods and issues focused on supporting teaching and learning.