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.

LEARN brings together those at NYU with expertise in computational methods, teaching and learning practices, educational technology design, and societal/policy perspectives on education in a unique, institution-wide interdisciplinary network. Through partnerships and institution-wide capacity building, LEARN connects students, instructors, and designers across NYU’s schools to advance data-informed education at the University and help NYU lead research on technology-enhanced education. LEARN is a supportive and inclusive community of researchers and practitioners that conducts interdisciplinary work to help scholars, analysts, educators, and leaders understand and use data in ethical and effective ways. LEARN is an intellectual hub for educational analytic innovation, a place where new ideas for the use of data in learning and teaching arise, germinate, and inspire research and action.

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. This provides a new approach to improving education by enabling better, data-informed, decision-making on a short-cycle real-time basis.
LEARN's key initial work focuses on the development and study of analytics that support instructors and students at NYU to maximize the success of their teaching and learning activities.

**Dashboards for Data-Informed Action**

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 this summer, provides instructors with high level information about how students engage with their NYU Classes course elements via weekly email. LEARN’s engagement in the TLT Instructional Dashboard has resulted in deep understanding of how instructors make data-informed decisions and tangible contributions to the tool’s design and support infrastructure. In further 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.

**Prediction and Personalization**

LEARN is working to support student learning through personalized solutions and predictive modeling with partners inside and outside of NYU.

The P.I.E. Challenge is a national competition in Israel to promote personalized learning solutions in high school math classrooms in which the winning solution is implemented in dozens of high schools throughout the country. LEARN collaborated with *NYU-PRIISM* to develop an evaluation framework with guidelines for data collection and analysis to determine the winning team. 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.
Reflective Writing Analytics

LEARN's reflection analytics projects are a collaboration with NYU’s College of Dentistry that apply natural language processing techniques to a large collection of previously collected 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.

Interaction Analytics

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, remote 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 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.
Engaging the 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. Below are just some of the kinds of community events LEARN hosts.

**Invited Speaker Series**
in which prominent learning analytics leaders from around the world present on cutting edge advances in educational data mining and data-informed decision-making.

**Stephanie Teasely** presented the University of Michigan's institutional initiatives to leverage data produced by digitally mediated educational tools to develop learning analytics to better understand and improve student outcomes.

**Local Action Sessions**
where learning analytics innovators at NYU share their ground-breaking work with the larger community.

**Xavier Ochoa** demonstrated his **Presentation Feedback Tool**, a system to facilitate the acquisition of oral presentation skills. It can be used autonomously, privately and repeatedly by students and instructors to practice and improve basic presentation skills.

**Interactive Workshops**
where participants engage with learning analytics tools, methods or issues related to supporting teaching and learning at NYU.

The NYU LEARN team facilitated a **Data Dilemmas Workshop** to discuss and debate real world dilemmas that have arisen for the use of analytic data to support learning. Talking in small groups, participants identified the principles and tensions at play from different perspectives.

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