Eberly Center

Teaching Excellence & Educational Innovation

ANNUAL REPORT

AY 2017-18

...emerging opportunities for learning

Connecting people, research, and practice...

Inspiring faculty to innovate in their teaching

Adapting our efforts to meet the growing needs and...

...to improve education at Carnegie Mellon

Carnegie Mellon University

Eberly Center for Teaching Excellence & Educational Innovation

Annual Report AY 2017-2018

Executive Summary

Connecting people, research, and practice to improve education at Carnegie Mellon.

We helped 149 faculty members in their selection and use of technology for learning.

Connecting. Inspiring. Adapting. It has been another successful year for the Eberly Center. A significant milestone this year was the grand opening of our new Technology-Enhanced Learning Center in the Tepper Quad Building – the culmination of a multi-year envisioning and design process. (For more on our role in learning space design across campus, see p. 24.) In the educational technology realm, we also reached an important target by completing the transition to Canvas, our new university-supported learning management system. (For more on our overall support of educational technology, see p. 22.) And last but certainly not least, we made a key commitment to incorporate more inclusive practices into our own workflows and to highlight inclusive teaching in our professional development programming. (For more on our numerous activities related to faculty support, see p. 6.)

Amidst these exciting new developments, the support and services we provide continue to be in high demand, as the record-setting numbers in this report attest. We have maintained our high-quality offerings and extended our impact on teaching and learning at CMU.

In AY 2017-18, we have...

Supported 570 faculty and staff educators through all of our events and services combined (a 23% increase over the previous year). Of these, 349 faculty members received individualized consultations on teaching and learning.

Served 608 graduate students and postdocs from 58 academic programs through our seminars, workshops, one-on-one consultations, and TA orientations.

Advised 39 programs and units on effective strategies for curriculum design and assessment, technology-enhanced learning, learning space design, and TA training.

Offered a 2.5-day Incoming Faculty Orientation to 58 new faculty hires.

Launched campus-wide Graduate Student Instructor Orientations preparing 356 students for their CMU teaching responsibilities across 42 academic units.

Hosted the second annual CMU Teaching & Learning Summit, attended by 177 CMU community members.
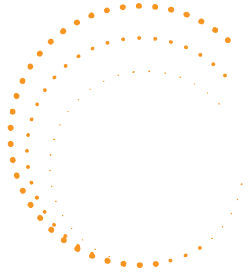
Inspiring faculty and graduate students to innovate in their teaching.

Adapting our efforts to meet the growing needs and emerging opportunities for learning.

Through these efforts, we reached faculty and graduate students across **all schools and colleges** at CMU.

An important aspect of our work involves educational technology. We help faculty (and graduate students in their teaching-related roles) incorporate technology deliberately to promote student learning – starting with what is known from learning science research and leveraging additional data for ongoing improvement. As such, we exemplify the best of **The Simon Initiative** and are proud to play a central role in translating these practices to teaching and learning at Carnegie Mellon University.

Leveraging expertise in both pedagogy and technology, the Eberly Center is an internationally recognized leader among university teaching centers. The book, *How Learning Works: 7 Research-Based Principles for Smart Teaching*, co-authored by current and former Eberly members, continues to receive acclaim. It was highlighted in *The Chronicle's* Teaching Newsletter and has a world-wide audience, with translations into Korean, Chinese, Japanese, Spanish, Arabic, and Italian. Our award-winning website received more than 2.5 million visits this year and is referenced by universities and teaching centers around the globe.

Amidst all our achievements, we still recognize the need to stretch and grow. Given the expanding responsibilities and opportunities that today's educators face – and the increased demand for Eberly Center services – we must continue to connect, inspire, and adapt.

In the coming year, we envision making an even greater impact on teaching and learning at CMU by helping more colleagues collect and use data to improve student learning and by enhancing CMU classrooms through data-informed design.

We are confident that, with our responsive approach to a dynamically shifting environment, we can empower our faculty and graduate student colleagues to create the conditions for Carnegie Mellon students to learn and, through this learning, transform their world.

Marsha C. Lovett, PhD
Director

We supported 126 colleagues in using learning data to improve outcomes in the context of 62 courses, 40 academic programs, and 12 edtech tools.

Creating a Community of Educators

Our mission is to distill the research on learning for faculty and graduate students and collaborate with them to design and implement meaningful educational experiences.

We believe that combining the science and art of teaching empowers our colleagues to create the conditions for students to learn and, through this learning, transform their world.

The Eberly Center Works With...

All faculty members, postdocs, and graduate students who want to reflect on and improve their teaching, including those who are:

- new to Carnegie Mellon and want to calibrate to our students and the institution.
- experienced and successful teachers who want to try new techniques or technologies.
- encountering difficulties in their courses and want help addressing problems.
- new to teaching and want help getting started (including graduate students who anticipate pursuing an academic career).

Our Approach Is...

Learner-centered | We put student learning at the center of the teaching process, helping faculty, postdocs and graduate students to develop course objectives, assessments, and instructional activities that together support and promote student learning and performance.

Educational | We help faculty members, postdocs and graduate students gain a deeper understanding of the principles that underlie effective learning and teaching so that they can make appropriate teaching decisions for their own courses. We do not simply dispense teaching tips.

Collaborative | We work closely with faculty, postdocs and graduate students to help them identify their strengths as teachers and to jointly devise strategies for course improvement and educational innovation.

Constructive | We focus on providing constructive and practical feedback to help our colleagues succeed as educators. Our role is to support teaching, not to judge performance.

Data-driven | We help faculty members, postdocs and graduate students to enhance their teaching by collecting information from student artifacts and performance, classroom observations, student focus groups, and examination of teaching materials.

Research-based | We synthesize and apply research, distilled from a range of disciplines, to help faculty and graduate students design and teach more effective courses. We also help faculty colleagues conduct educational research where gaps in the literature exist.

Significant milestones in Eberly Center's recent history

Solve a Teaching Problem
Award-winning site
launched
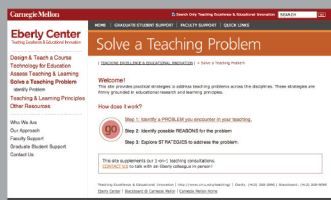
How Learning Works
published

Learning Principles
pedagogical framework
for Open Learning Initiative

2008

2010

2010

CMU Faculty and Staff Served by Consultations

349

span
all 7
colleges
& schools

246 courses served

Serving
1 in 3
faculty
teaching CMU
courses.
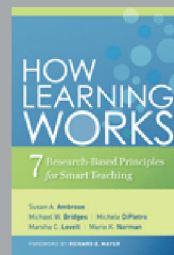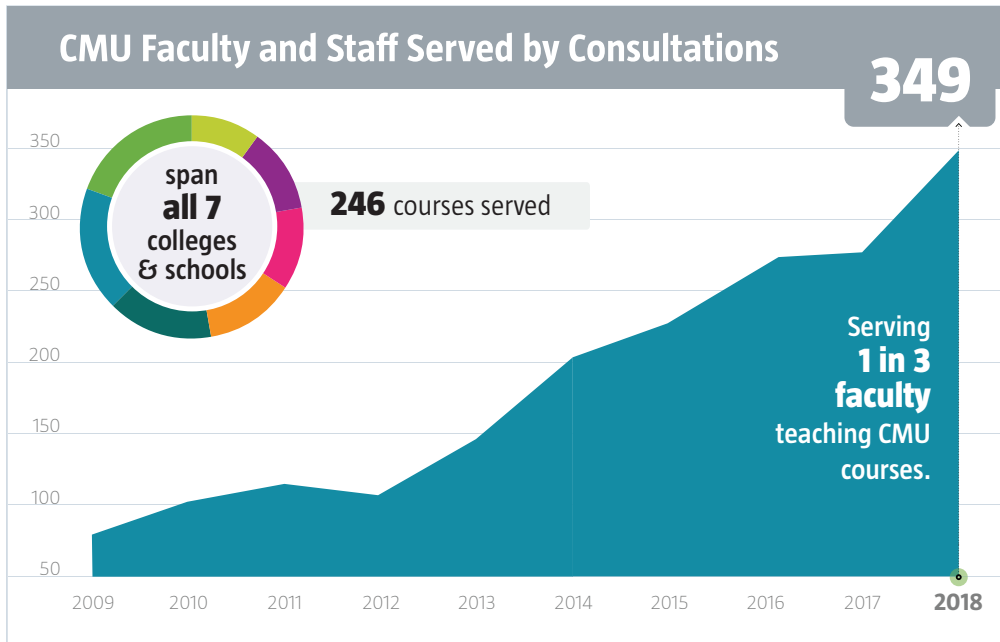
350
300
250
200
150
100
50

2009 2010 2011 2012 2013 2014 2015 2016 2017 **2018**

Consultations Are...

Strictly confidential | We do not disclose any information from our consultations. This includes the identities of those with whom we work, the information they share with us, and data we gather on their behalf via classroom observations and interactions with TAs and students.

Documented for faculty and graduate student purposes alone | We provide written feedback to the colleagues with whom we consult that summarizes and documents the consultation process. We do not write letters of support for reappointment, promotion or tenure, but

faculty can choose to use our documentation as they see fit.

Voluntary | We do not seek out faculty or graduate students for teaching consultations, but we are happy to meet with anyone who contacts us.

www.cmu.edu/teaching

Welcome
Marsha Lovett, PhD
New Director

Eberly Center for
Teaching Excellence and
the Office of Technology
for Education merge,
integrating technology
and pedagogical support

The Simon Initiative
announced!
Marsha Lovett named
Simon Co-coordinator;
Eberly Center fine tunes
support model to address
emerging need

Eberly Center launches
first-ever conference for
CMU educators,
building community
around teaching.

Eberly Center
Teaching Excellence & Educational Innovation

2012

2013

The Simon Initiative

2013

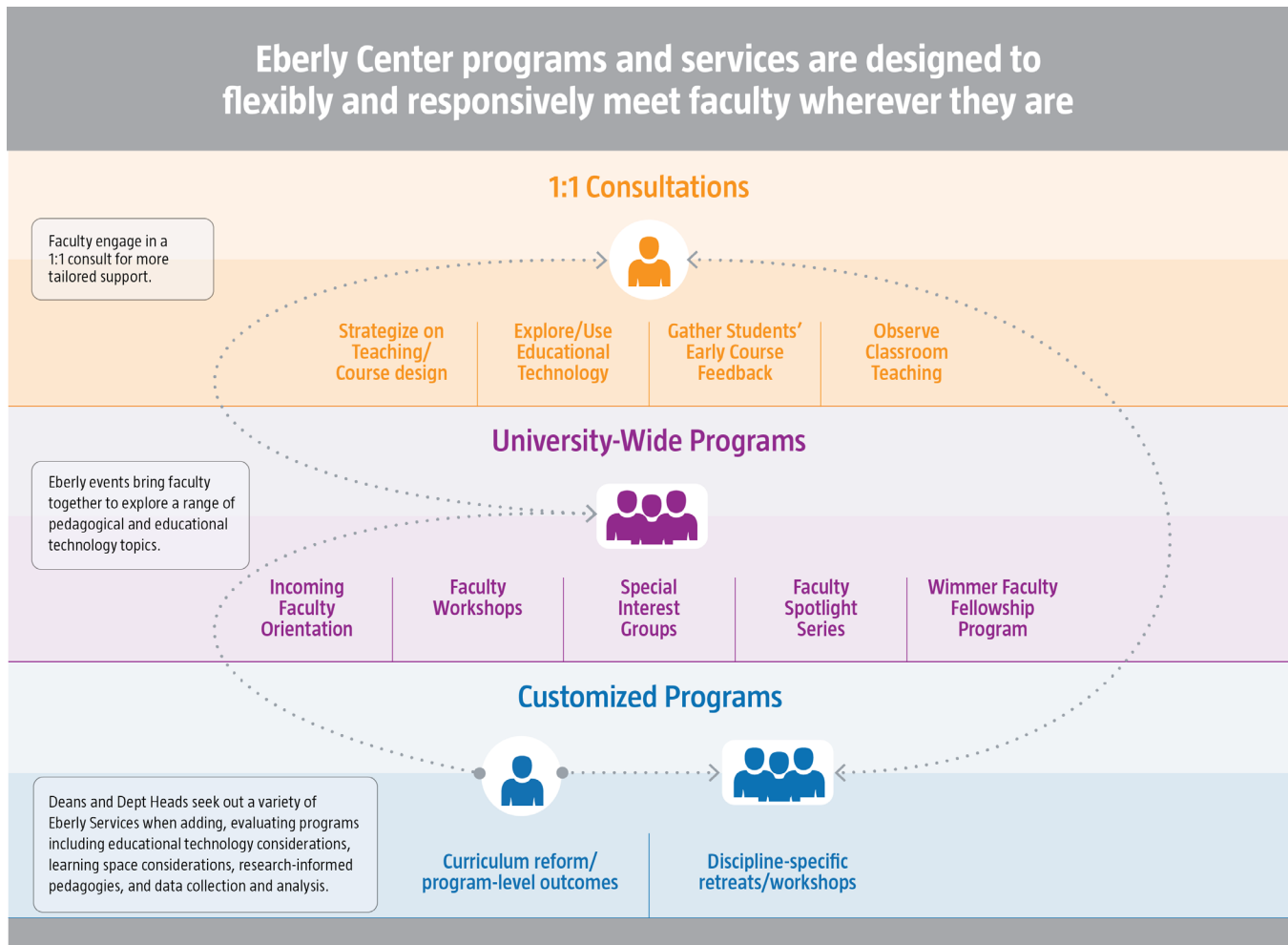**Teaching & Learning**
Summit

2016

Faculty Support

Faculty demand
for Eberly Center
services reached a
new all-time high
in AY 2017-18.

The Eberly Center offers an array of evidence-based programs and consultation services to support the diverse teaching needs of all CMU faculty. Designed to flexibly and responsively "meet faculty wherever they are," our menu of services offers various pathways for timely and ongoing support. For example, faculty may attend an Eberly workshop or event to learn about an instructional strategy or tool and then request a one-on-one consultation for help implementing changes in their teaching practice. At the same time, consultations reveal emerging patterns in faculty needs and interests, informing our design of

targeted programs that disseminate relevant research findings and bring together faculty to share their experiences and exchange ideas.

Several of our university-wide and customized, unit-level programs addressed educational challenges frequently raised during consultations with instructors and program administrators.

Eberly Center programs and services are designed to flexibly and responsively meet faculty wherever they are

1:1 Consultations

Faculty engage in a 1:1 consult for more tailored support.

| Strategize on Teaching/ Course design | Explore/Use Educational Technology | Gather Students' Early Course Feedback | Observe Classroom Teaching |

University-Wide Programs

Eberly events bring faculty together to explore a range of pedagogical and educational technology topics.

| Incoming Faculty Orientation | Faculty Workshops | Special Interest Groups | Faculty Spotlight Series | Wimmer Faculty Fellowship Program |

Customized Programs

Deans and Dept Heads seek out a variety of Eberly Services when adding, evaluating programs including educational technology considerations, learning space considerations, research-informed pedagogies, and data collection and analysis.

| Curriculum reform/ program-level outcomes | Discipline-specific retreats/workshops |

Highlights of AY 2017-18

Faculty demand for Eberly Center programs and services reached a new all-time high. **Overall, 570 CMU faculty and staff members** took advantage of Eberly Center programs and services, representing approximately **50% of faculty instructors** who taught CMU courses in AY 2017-18.

Delivering tailored support to faculty

We provided **consultation services** to **349 faculty and staff member**s with educational responsibilities, addressing their particular situations.

We helped **126 faculty and staff members leverage learning data** to improve teaching and learning outcomes associated with 62 CMU courses, 40 academic programs, and 12 technology-enhanced learning tools.

We provided Early Course Feedback services to **73 faculty instructors in 93 CMU courses** (including 88 focus groups and 7 surveys) to gather anonymous, consensus-checked, formative feedback from students.

We conducted **classroom observations for 26 faculty in 30 CMU courses**, collecting objective data on instructor and student behavior, to formatively guide future teaching practices and the implementation of particular evidence-based techniques.

Disseminating evidence-based teaching practices

358 faculty and staff members filled 455 seats at our university-wide and customized, unit-level programs.

58 newly hired faculty members attended **Incoming Faculty Orientation**, fostering an interdisciplinary community and culture around evidence-based teaching and learning.

We coordinated CMU's **Teaching Innovation Award**, recognizing instructors for innovative teaching strategies that enhance student outcomes in CMU courses and programs.

We hosted the second annual CMU **Teaching & Learning Summit**, attended by 177 members of the CMU community, and featuring the innovative and evidence-based approaches of over 90 CMU faculty, staff, postdocs and graduate students.

33 CMU-Qatar faculty filled 61 seats across 5 distance seminars.

Responding to emerging needs, interests

We launched **two new Special Interest Groups** to help instructors implement evidence-based approaches for "Inclusive Teaching Strategies" and "Designing Transformative Interdisciplinary Courses".

We developed two seminars: "**Creating Digitally Accessible Slides that Maximize Learning**" and "Instrumented Classrooms: Opportunities for Collecting Data on Student Engagement".
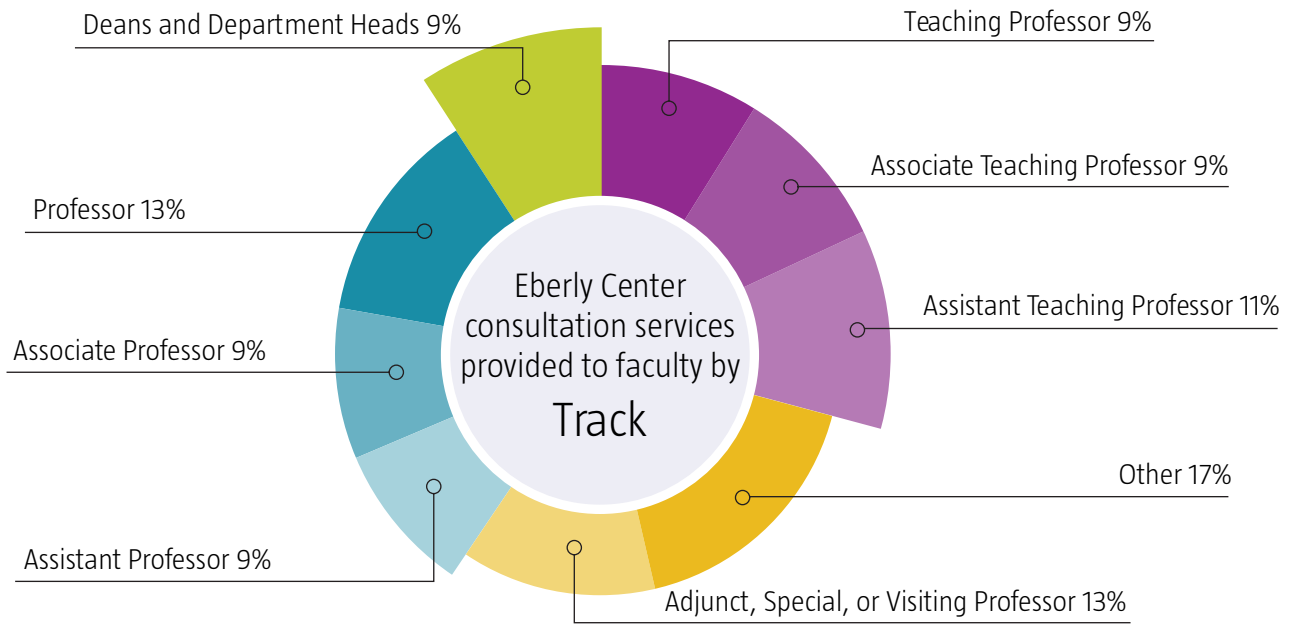
We facilitated **12 customized seminars** during departmental faculty meetings, targeting the specific needs identified by instructors.

We hosted **two multi-day Institutes**: "Technology-Enhanced Learning Institute: Strategies and Technologies for Creating an Effective Online Learning Module" and "Teaching as Research Institute: Which Active Learning Strategies Work Best, for What and for Whom?"

"Eberly Center teaching consultations and resources have been absolutely invaluable in preparing and delivering my course. My teaching consultant helped me think through areas I had not considered, answered a variety of questions, and gave me confidence with challenges that came up while delivering the class. She did so much to help this first run of the class go smoothly for me and the students, so they could focus on learning that material. For that, I am forever grateful."

– New faculty member

Deans and Department Heads 9%

Teaching Professor 9%

Professor 13%

Associate Teaching Professor 9%

Eberly Center
consultation services
provided to faculty by
Track

Assistant Teaching Professor 11%

Associate Professor 9%

Other 17%

Assistant Professor 9%

Adjunct, Special, or Visiting Professor 13%

University-Wide Programs

To support the teaching endeavors of CMU faculty, the Eberly Center offers a diverse set of programs each year. We design these programs to address issues arising frequently during individual consultations with instructors and program administrators. Each event is open to faculty of all disciplines, ranks, and tracks. All events are highly interactive and seek to build community and culture around teaching at CMU by:

- synthesizing and distilling relevant research findings on teaching and learning.
- disseminating teaching innovations.
- modeling and sharing practical, evidence-based teaching strategies and uses of educational technology.
- exploring ways to translate evidence-based practices to one's own teaching practice.
- providing lively venues for faculty to discuss teaching and learning with colleagues across disciplines.

A grand total of 358 faculty and staff filled 455 seats at our university-wide programs (increases of 38% and 23%, respectively).

Teaching & Learning Summit

On October 19, 2017, we held the second annual CMU Teaching & Learning Summit, a half-day conference focused on teaching and learning. This highly interactive event gathered the CMU community to:
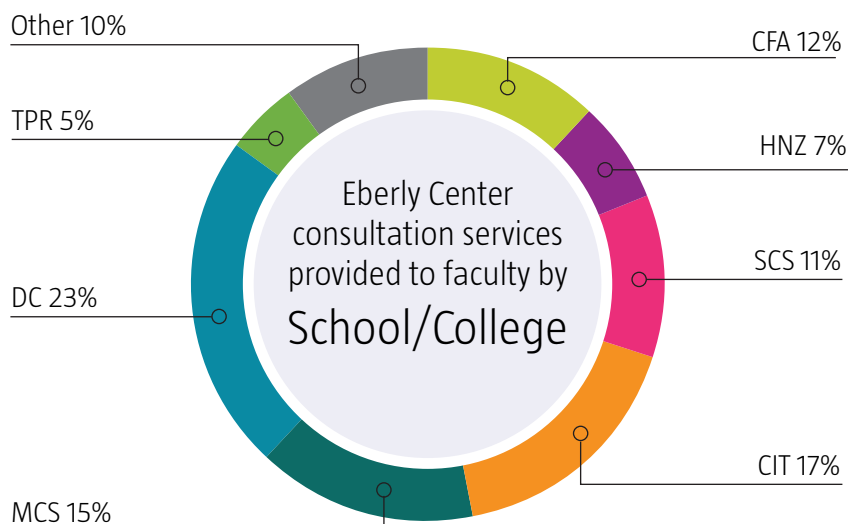
- foster dialogue, networking and collaboration within and across disciplines.
- showcase the educational research of CMU instructors and learning scientists.
- disseminate transferable, evidence-based and innovative teaching strategies employed by CMU instructors.

Teaching & **Learning**
Summit

HA VE Y OU REGIS TE RED YE T!
www.cmu.edu/teaching/summit

foster dialogue   showcase CMU   disseminate innovative
across disciplines   educational research   evidence-based teaching

Join colleagues from across campus for roundtable discussions, quick-fire interactive talks,
poster sessions, technology-enhanced learning demonstrations, and more!

Thursday | October 19, 2017 | 1-5PM

Eberly Center
Teaching Excellence & Educational Innovation

Carnegie Mellon University

The CRLT Players, a performance group of the University of Michigan's Center for Research on Learning and Teaching, led the **plenary session on inclusive teaching**.

"I am very grateful to you and the staff at the Eberly Center for teaching me to be a teacher, for the continuous support, and for the organization of great events like this Teaching & Learning Summit."
– *Professor*

Other 10%

TPR 5%

DC 23%

MCS 15%

CFA 12%

HNZ 7%

SCS 11%

CIT 17%

Eberly Center consultation services provided to faculty by
School/College

We provided consultation services to 349 faculty members representing all seven colleges and schools at CMU.

Using a combination of performed vignettes and interactive discussion, they engaged the audience in considering how classroom climate impacts student motivation and learning, which factors lead to a positive or negative classroom climate, and how the instructor can create an inclusive learning environment through proactive and in-the-moment strategies.

The event also included presentations and posters highlighting over 90 CMU faculty, staff, postdocs, and graduate students sharing their innovative and evidence-based teaching strategies, course designs, and technology-enhanced learning practices.

Summit participants (177 total) represented all seven schools and colleges, and included **97 faculty, 50 graduate students, 5 postdocs, and 25 staff members** who contribute to CMU's educational mission.

Teaching as Research Institute

To help promote a culture of data-informed teaching and course/program design at CMU, the Eberly Center hosted the third Teaching as Research Institute (three half-days), in June 2018. **Twenty-seven faculty** members attended. The Institute focused on examining the extant educational

research on active learning strategies, with particular focus on which techniques work best (e.g., for what and for which students). The program also introduced faculty to a toolkit of strategies on classroom research methods as well as Eberly Center services to support faculty in this work. Twelve participants initiated collaborations with Eberly Center colleagues to design, implement, and disseminate studies of student learning outcomes in CMU courses and programs.

Special Interest Groups (SIGs)

SIGs bring together small, multidisciplinary groups of faculty to build community and sustain dialogues around teaching by exploring topics in depth, beyond what is possible in a single, stand-alone seminar. Eberly colleagues design and facilitate SIGs, tailoring programs to meet the emerging needs of participants via seminar or roundtable formats. In seminar-style SIGs, faculty experience novel pedagogical strategies "hands-on" and then reflect upon and discuss their experiences from the perspectives of both students and instructors. Seminar style SIGs often conclude via small group or 1-on-1 consultations in which faculty members discuss with an Eberly colleague how the focal strategies might be effectively transferred to their future teaching. In roundtable-style SIGs,

"In the 15 years I've taught at CMU, your [Eberly Center] 3-part course was the first time I'd been formally taught how to do the job I was hired to do. So, thanks! [What I learned] will be very useful in the fall when I teach the class again."

– Professor

faculty currently implementing particular teaching strategies meet periodically to discuss their experiences, share effective strategies, discuss feedback gathered from students via Early Course Feedback surveys or focus groups, and engage in collaborative problem solving to address ongoing challenges. In AY 2017-18, we facilitated two new seminar-style SIGs: **"Inclusive Teaching Strategies"** and **"Designing Transformative Interdisciplinary Courses"**. Overall, forty-seven faculty engaged in these series of 90-minute interactive sessions to explore how to apply educational research and evidence-based teaching strategies to their CMU courses.

Seminars

We presented two university-wide seminars in AY 2017-18 titled: **"Creating Digitally Accessible Slides that Maximize Learning"** and **"Instrumented Classrooms: Opportunities for Collecting Data on Student Engagement"**.

Promoting inclusive teaching with technology, the first session explored the following question: How do we create slides that are accessible to and support the learning of all students? This session provided a forum for discussion regarding universal design, with a particular emphasis on supporting students with disabilities. Relevant educational research on multimedia learning was leveraged to inform discussions of various practical strategies.

The second session engaged instructors and researchers regarding the state-of-the-art Technology Enhanced Learning (TEL) Center now open in the new Tepper Quad. Participants discussed a variety of research questions relevant to CMU courses and learners and how various data sources from an instrumented classroom might be leveraged to provide data to instructors to iteratively inform their teaching and course design practices.

Additionally, after conducting a needs assessment focus group with twenty-two CMU Qatar faculty, we designed and delivered five 60-minute, interactive seminars to support the professional development of faculty teaching on the CMU Qatar campus. We offered these seminars via synchronous, video conference technology. Thirty-one faculty filled 61 seats at the following seminars:
- Engaging Students Effectively Via Active Learning
- Flipping the Classroom
- Teaching Effectively with Canvas
- Conducting Productive and Engaging Discussions
- Creating Desirable (Yet Appropriately Challenging) Difficulties to Enhance Learning

Wimmer Faculty Fellows Program

The Wimmer Faculty Fellows program is designed for junior faculty members interested in enhancing their teaching through concentrated work designing or redesigning a course, innovating new materials, or exploring a new pedagogical approach.

Eberly Center colleagues work individually with each Wimmer Faculty Fellow according to his/her particular needs. Each fellow receives a stipend, funded by a gift from the Wimmer Family Foundation, to acknowledge the work it takes to improve one's effectiveness as an educator.

Wimmer Faculty Fellows were:
- Rosalyn Abbott, Assistant Professor, Biomedical Engineering, College of Engineering
- Robin Mejia, Adjunct Professor, Statistics and Data Science, Dietrich College of Humanities and Social Sciences
- Daphne Peters, Assistant Teaching Professor, Design, College of Fine Arts
- Rebecca Taylor, Assistant Professor, Mechanical Engineering, College of Engineering
- Zachary Ulissi, Assistant Professor, Chemical Engineering, College of Engineering

Incoming Faculty Orientation

For over 30 years, the Eberly Center has offered programming to support newly hired faculty regarding their teaching responsibilities. Incoming Faculty Orientation is designed to:

- help faculty calibrate their teaching to CMU students and standards
- uncover and challenge assumptions about teaching and learning
- disseminate practical, research-based strategies for teaching
- promote effective uses of technology
- facilitate dialogue across disciplines
- communicate the Eberly Center's approach, programs, and services.

This year, for the second time, we also collaborated with the Office of the Vice Provost for Faculty, to support faculty in teaching, research, and creative endeavors. To accomplish these objectives, we presented a 2.5-day program of interactive, research-based workshops on topics related to teaching and learning as well as securing research funding, understanding how the university works, and maintaining healthy work-life balance. The program also included a panel discussion with experienced faculty as well as case study discussions on CMU academic policies, led by the Vice Provost for Education, to give participants ample time to ask questions about their new academic community.

We invited all faculty members who are new to CMU-Pittsburgh (e.g., tenure-track, teaching-track, visiting, adjunct) to participate. Year after year, the majority of incoming faculty members attend this optional orientation program, even though most are in the midst of transitioning to Pittsburgh and CMU. In 2017, 58 new faculty attended.

Customized Unit-Level Programs

The Eberly Center responds to requests from individual academic units based on their particular needs for faculty professional development. Eberly colleagues collaborate with CMU Deans and Department Heads to design and facilitate workshops, faculty meetings, and faculty retreats tailored to address discipline-specific needs. Last year, the Eberly Center provided the following customized programs:

Mellon College of Science
- EUREKA! First Year Seminar, Invited session: How learning works: What does research suggest about how to maximize your learning in MCS courses?
- 6th Annual Biological Sciences Undergraduate Teaching Symposium:
  - Canvas 101: Introduction to Features and their Effective Application
  - Using GradeScope to Efficiently and Effectively Grade and Provide Feedback at Scale

Dietrich College of Humanities & Social Sciences:
- Technology-Enhanced Learning Bootcamp
- Grand Challenge Interdisciplinary Course Design Special Interest Group (2 sessions)
- Department of History: Reducing Barriers to Student Achievement
- Department of Modern Languages: Motivating Students by Promoting a Growth Mindset
- Department of Psychology: Teaching and Reaching All Students

College of Engineering:
- Department of Mechanical Engineering: Supporting Students of Concern
- Teaching-Track Faculty Special Interest Group (2 sessions)

Heinz College of Public Policy and Information Management:
- Academic Integrity

"Many thanks for your collaboration on planning and delivering the recent [customized] faculty workshops for [my program]. Your expertise in running pragmatic and effective workshops was invaluable as we launch these efforts. "
— *Program Coordinator*

"Thanks so much for meeting with the teaching group in our department. It was an excellent discussion, and there was universal agreement that it would be great to continue."
— *Teaching Professor*

Promoting Research on Teaching & Learning

"Improvement in post secondary education will require converting teaching from a solo sport to a community based research activity."

– Herb Simon

Not only do CMU faculty seek Eberly Center support to engage in evidence-based teaching, we are seeing many faculty interested in conducting educational research themselves – in the context of their courses. This year, we supported **126 faculty and staff members in using learning outcome data** to improve teaching and learning outcomes associated with 62 CMU courses, 40 academic programs, and 12 technology-enhanced learning tools. These faculty members are taking a data-driven approach to improving education.

As in past years, we support our colleagues' work in this area through one-on-one consultations, supporting the ProSEED/Simon Initiative and A.W. Mellon Faculty Seed Grant programs, and contributing to education-related grant work. In addition, this year we offered the third annual 3-day Teaching as Research Institute.

Faculty Teaching as Research Institute

To help promote a culture of data-informed teaching and course/program design at CMU, the Eberly Center hosted a 3-day Teaching as Research Institute. **Twenty-seven faculty members attended**, learning a toolkit of strategies on classroom research methods and how the Eberly Center can support this work. The pedagogical theme of the Institute was " Which Active Learning Strategies Work Best: For What and For Whom?"

At the end of the program, faculty members were invited to work with an Eberly colleague to initiate a "teaching as research" project – to be conducted in one of their upcoming courses. At the time of this writing, approximately **half of the faculty participants** have begun work on classroom-based research projects.

Consultations on the Scholarship of Teaching and Learning

Regardless of participation in our "Teaching as Research" institute, we will work with faculty colleagues on discipline-based educational research – from designing a study and planning instructional interventions, to creating valid and reliable measures of learning, to identifying relevant journals and conferences for disseminating the work. Often these consultations stem from a faculty member's initial interest in trying out a new pedagogy or educational technology, and that grows into a quest to study and improve the intervention's effectiveness. Some of these projects are already in the stage of getting disseminated across CMU and beyond via peer-reviewed academic conferences and publications. For examples, please see our Teaching as Research website showcasing such projects.
www.cmu.edu/teaching/teaching-as-research

Examples include:
- Comparing inquiry-based lab activities to traditional (cookbook-like) instructions in a materials science laboratory course with Sarah Christian, Assistant Teaching Professor of Civil & Environmental Engineering.
- Investigating the impact of a simulation-based game environment (Minecraft) on students' visualization skills and conceptual learning with Reeja Jayan, Assistant Professor of Mechanical Engineering.
- Comparing several approaches to active learning, such as how much one should discuss right vs. wrong answers, in a Masters-level information systems course with Mike McCarthy, Associate Teaching Professor of Information Science, and Joseph Mertz, Teaching Professor of Information Systems & Heinz.
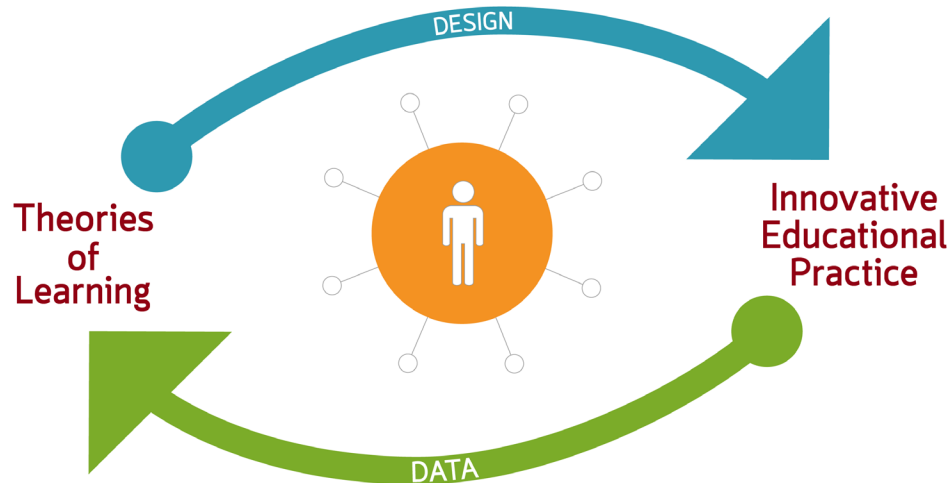
ProSEED Simon Initiative Seed Grants

The ProSEED program was launched in 2014 to "play a catalytic role in supporting promising, creative ideas in education and research." The Eberly Center continues to support The Simon Initiative Seed Grants within the ProSEED program by:

- Answering questions about effective learning outcomes assessment when faculty are writing their proposals
- Serving on the proposal review panel
- Providing support and consultation to awardees on instruction, assessment, and educational technology design.

Education-Related Grant Proposals and Grant-Funded Work

Eberly Center personnel are regularly invited by faculty colleagues to contribute to education-related grants. Depending on the project's needs, we contribute expertise in course and curriculum design, assessment planning, and/or educational technology development. This year we consulted or collaborated on **ten new grant proposals** with an educational innovation or learning research component. These included NSF CAREER proposals and research proposals to various government agencies and philanthropic foundations. We continued our participation in the following funded projects:

- Cultivating Digital Scholarship and Technology-Enhanced Learning in the Humanities. (09/01/2014-08/31/2019). Andrew W. Mellon Foundation, $2 million.
- I-Corps Site at Carnegie Mellon University: A Model Promoting University Innovation, Entrepreneurship, and Regional Growth. (05/01/2014 - 10/30/2017). National Science Foundation, $299,110.
- Lowering Barriers to the Use of Evidence Based Educational Innovations. (01/01/2016-12/31/2017). Arthur Vining Davis Foundations, $225,000.
- Supporting Innovation at CMU: ProSEED/ Simon Initiative Projects. (10/26/16-10/25/19). The Eberly Foundation, $90,000.

Graduate Student & Postdoc Support

We offer a wide range of services to graduate students and postdocs, to support them as teaching assistants or instructors during their time at Carnegie Mellon and as future faculty members at other institutions. From a first-time TA to an experienced instructor of record, our services accommodate graduate students' and postdocs' diverse needs, goals, and available time. And regardless of current teaching duties, the common goal across all of our graduate student services is to disseminate evidence-based teaching strategies in ways that are accessible and actionable. In addition to providing these services directly to graduate students and postdocs, we participate in university- and unit-level orientations and professional development series, and we support graduate program coordinators and individual faculty members as they train and support their graduate students and postdocs to be teaching assistants or instructors of record.

"I felt so prepared for teaching this semester because of everything the Eberly Center taught me. I have been incorporating a wide breadth of active learning activities in class including: Just in time teaching, muddiest point, Think-Pair-Shares (about 3 - 7 in just about every class) and I did my first jigsaw activity this week. It's been nothing but FANTASTIC to be able to apply everything you've taught me in my class. I'm extremely happy at my new job, and I don't think this would have been possible without your help."

— *Graduate student alum, upon becoming a faculty member*

Highlights of AY 2017-18

Serving the diverse CMU community: Across all of our programs and services, we served more than 608 unique graduate students and postdocs from all seven schools and colleges, representing 58 academic programs.

Disseminating evidence-based teaching practices: 463 graduate students and postdocs filled 1206 seats at our university-wide programs, and 150 graduate students attended our 14 customized, unit-level TA training events.

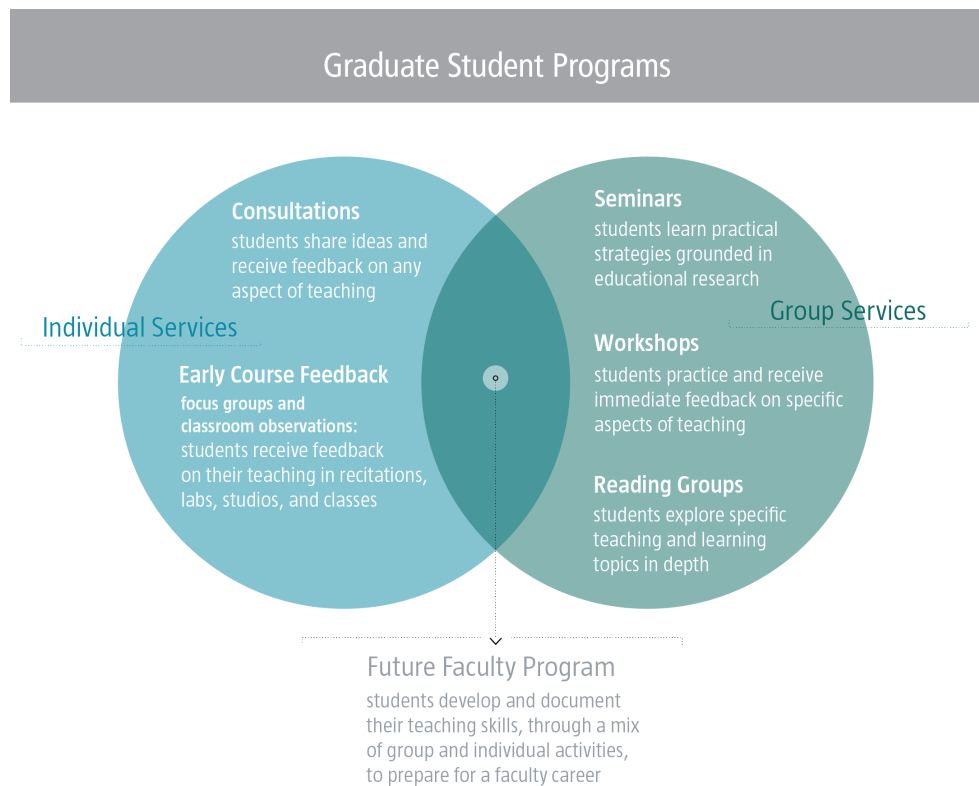**Supporting individual CMU graduate students and postdocs:** We provided 304 consultations to 159 unique graduate students and postdocs.

Training Graduate Students for their CMU Teaching Appointments: We launched a campus-wide Graduate Student Instructor Orientation that prepared 356 instructors and teaching assistants from 42 academic units.

Graduate Student Programs

Consultations
students share ideas and receive feedback on any aspect of teaching

Individual Services

Early Course Feedback
focus groups and classroom observations: students receive feedback on their teaching in recitations, labs, studios, and classes

Seminars
students learn practical strategies grounded in educational research

Group Services

Workshops
students practice and receive immediate feedback on specific aspects of teaching

Reading Groups
students explore specific teaching and learning topics in depth

Future Faculty Program
students develop and document their teaching skills, through a mix of group and individual activities, to prepare for a faculty career

Preparing graduate students and post-docs to teach as faculty: The number of graduate students and postdocs participating in our Future Faculty Program continued to grow this year. Fifty-five new participants enrolled in the program and a grand total of 189 individuals participated. This year, 21 participants finished the program requirements.

Responding to emerging needs and interests: We developed 11 new programs (5 customized TA training events and 6 university-wide seminars to respond to new CMU policies and initiatives, new trends in TA responsibilities, and emerging needs of graduate students, postdocs, and academic units at CMU).

Graduate Student Consultations

Graduate students can work one-on-one with an Eberly consultant to ask questions, discuss ideas, and get feedback on teaching strategies, activities, and materials. Many of these consultations involve multiple interactions as well as multiple methods of collecting data on student learning, such as classroom observations of teaching and student feedback surveys and focus groups. For example, a graduate student may meet one-on-one with an Eberly consultant prior to beginning a TA appointment to discuss strategies for facilitating student participation; then, during the semester of the TA appointment, the graduate student may request a classroom observation from an Eberly consultant to gain additional feedback. Because so many graduate students are enrolled in multi-year programs, we often have the opportunity to work with graduate students over several semesters and play a significant role in their development as educators. We provided 304 consultations to 159 unique graduate students and postdocs. The vast majority of graduate students were enrolled in doctoral programs, but masters degree students were also served.
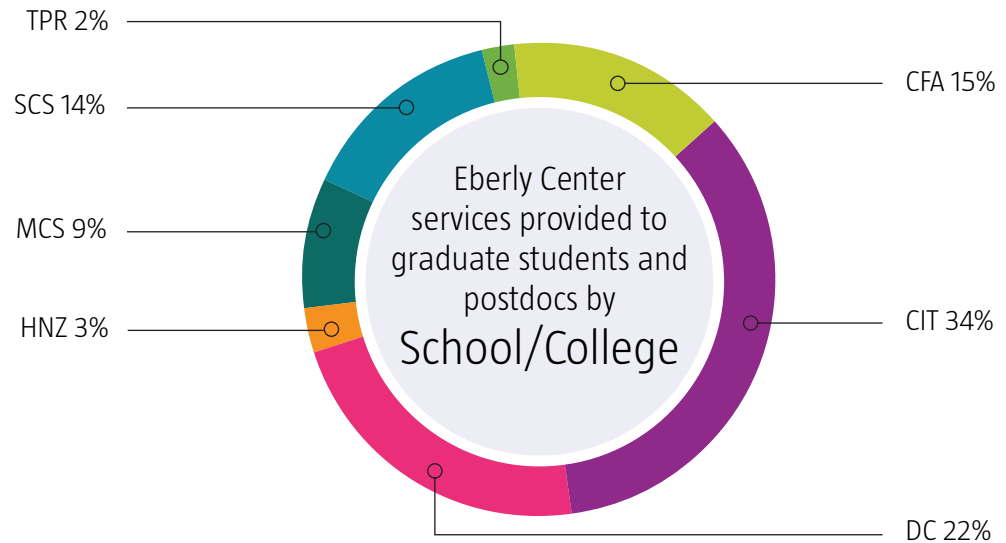
Graduate Teaching Fellows

Graduate Teaching Fellows (GTFs) are a select group of experienced CMU graduate student instructors from a variety of disciplines, who are recognized for their teaching effectiveness and commitment to student learning. Full-time Eberly Center staff provide GTFs with advanced training in evidence-based teaching strategies and teaching consultation techniques through regular "teaching circle" meetings.

In AY 2017-18, the Eberly Center worked with 13 GTFs; **back row:** Maggie Goss (English), Amy Shannon Cook (Human and Computer Interactions), Clive Newstead (Math), Alexis Adamvs (Modern Languages), Nicholas Cheadle (Modern Languages); **front row:** Antoine Remond-Tiedrez (Math), David Gerritsen (Human and Computer Interactions), Patrick Walsh (Philosophy), Niranjini Rajagopal (Electrical and Computer Engineering); **not pictured:** Darya Melicher (Institute for Software Research), Olaitan Awomolo (Architecture), Aidan Kestigian (Philosophy), Ryan Mitchell (English)

Besides receiving the most in-depth professional development we provide to CMU graduate students, Graduate Teaching Fellows (GTFs) in turn contribute to the Eberly Center's activities to support graduate students. Last year, GTFs provided 114 of the one-on-one, confidential consultation services (i.e., classroom observations, microteaching video consultations, or teaching philosophy consultations) to 79 unique graduate students and postdocs.

We launched Graduate Student Instructor Orientation, serving 356 instructors and teaching assistants [from 42 academic units].

TPR 2%

SCS 14%

MCS 9%

HNZ 3%

Eberly Center
services provided to
graduate students and
postdocs by
School/College

CFA 15%

CIT 34%

DC 22%

University-Wide Programs

This year, 463 unique graduates students and postdocs, representing all 7 CMU schools/colleges, attended our university-wide seminars and workshops, filling a grand total of 1206 seats. Our university-wide programs integrate educational research and theory with practical pedagogical strategies and give graduate students from all schools and colleges the opportunity to interact with and learn from each other. The popularity of our seminars and workshops makes them a highly effective "gateway" service in that many students participate in several seminars and then pursue our small group activities and one-on-one services to go into greater depth with some aspect of teaching and learning.

Teaching & Learning Summit

On October 19, 2017, we held the second annual CMU Teaching & Learning Summit, a half-day conference focused on teaching and learning. This highly interactive event gathers the CMU community to:
- foster dialogue, networking and collaboration within and across disciplines.
- showcase the educational research of CMU instructors and learning scientists.
- disseminate transferable, evidence-based and innovative teaching strategies employed by CMU instructors.

CRLT Players, a performance group of the University of Michigan's Center for Research on Learning and Teaching, led the plenary session on inclusive teaching. Using a combination of performed vignettes and interactive discussion, the CRLT Players engaged the audience in considering how classroom climate impacts student motivation and learning, which factors lead to a positive or negative classroom climate, and how the instructor can create an inclusive learning environment through proactive and in-the-moment strategies. The event also included Quick-Fire Talks highlighting CMU instructors who use innovative teaching strategy or course designs and a poster session showcasing evidence-based and innovative teaching and technology-enhanced learning practices.

Participants (177 total) represented all seven schools and colleges, and included 50 graduate students, 5 postdocs, 97 faculty, and 25 staff members who contribute to CMU's educational mission. Sixty-two of these participants, including many graduate students and postdocs contributed posters and/or presentations.

Seminars

Our 90-minute seminars cover a wide variety of topics related to teaching, learning, and professional development as an educator.

We presented 18 seminars, including six new topics to respond to the expanding teaching responsibilities and practices of graduate student TAs and instructors. To help graduate students learn the fundamentals of teaching and learning, we offer a minimum of 8-10 "core" seminars at least once each year, including sessions offered at Graduate Student Instructor Orientation (*core seminars). Note that our Future Faculty Program includes these core seminars as one of its requirements.

Fall 2017
- New! Canvas 101: Teaching Effectively with CMU's New Learning Management System
- New! Creating Digitally Accessible Slides that Maximize Learning
- New! Designing Effective Assessments: Multiple Choice Questions*
- Conducting Productive and Engaging Discussions*
- Encouraging Student Intellectual Development and Lifelong Learning*
- Engaging Students in Active Learning*
- Ethical Issues in Teaching and Learning
- Guiding Attention and Memory to Build Knowledge*
- Leveraging Diversity and Promoting Equity in your Classroom*

Spring 2018
- New! Designing Effective Writing Assessments: Open-Ended Questions*
- New! Incorporating Writing in Your Discipline
- New! Navigating Issues of Identity and Authority in the Classroom*
- Course and Syllabus Design*
- Fostering a Positive Classroom Climate*
- Motivating and Engaging Students*

Summer 2018
- Crafting a Teaching Philosophy Statement
- Facilitating Difficult Dialogues*
- Helping Students Develop Mastery and Critical Thinking*
- Planning and Delivering Effective Lectures*

Workshops

Our Microteaching Workshops, usually 2.5 hours long, give participants the opportunity to practice and receive immediate feedback on specific aspects of teaching. This year, **46 unique graduate students participated in microteaching workshops**. During these workshops, students teach a five-minute lesson and receive immediate feedback from colleagues and an Eberly Center teaching consultant or Graduate Teaching Fellow.

Graduate Student Instructor Orientation (GSIO)

To increase the scope and scale of training for newly appointed graduate student instructors, the Eberly Center piloted the **first university-wide orientation** programs for graduate student instructors. GSIO events occurred during the week prior to classes in Fall and Spring semesters. Participation by students and academic units was voluntary. All CMU graduate students, regardless of whether or not they had teaching appointments, were welcome to attend.

All three GSIO events featured the same all-day program, which included five 90-minute seminars:
- Teaching Inclusively: Creating a Supportive and Welcoming Climate from Day One
- Grading and Delivering Feedback on Quantitative Assignments
- Grading and Delivering Feedback on Qualitative Assignments
- Conducting Productive and Engaging Discussions
- Working Well One-on-One with Students

We designed sessions, based a needs as-sessment data, to align with responsibilities of a wide variety of teaching appointments, including instructors of record, graders, and TAs holding office hours and/or leading lab, recitation, and discussion sections sections. During seminars, participants were grouped by discipline and asked to practice seminar content on disciplinary-relevant examples. Switching to the GSIO model allowed us to serve 356 unique students in 42 academic departments compared to 134 unique students in 11 departments in our previous model of providing customized training sessions to individual academic units.

GSIO Metrics	Fall 2017	Spring 2018
Total Seats Filled	598	178
Unique Students Attending	275	81
Students Attending More Than One Session	221 out of 275	62 out of 81
Academic Departments Served	39	25
School/Colleges Served	6 out of 7	7 out of 7

Customized Unit-Level Programs

To complement our university-wide pro-grams, we develop and deliver hands-on seminars that address specific, unit-level needs of graduate student instructors. These requests come from a variety of sources: graduate program coordinators, faculty members in a supervisory role (i.e., instructors of record, course coordinators, or TA trainers), and graduate students who coordinate professional development activ-ities or teaching training for fellow students in their departments. **150 unique graduate students participated in 14 customized unit-level sessions**, 5 of which were new topics. This number of instructors served doubled compared to the previous year.

Academic Units Served

Civil and Environmental Engineering
• Problem Solving in Small Groups, Fall 2017
• Experienced TA Panel, Fall 2017
• Putting Teaching Knowledge into Practice, Fall 2017

Computer Science
• Manipulating Your Students' Brains for Good (Not Evil) AKA Guiding Attention and Memory, Fall 2017 and Spring 2018

Dietrich College of Humanities & Social Sciences
• Technology Enhanced Learning Bootcamp
• Creating Multimedia that Works for Learning
• Using TEL to Extend the Classroom
• Effective Uses of TEL for Active Learning

Electrical and Computer Engineering
• Problem Solving in Small Groups, Fall 2017 and Spring 2018
• Leveraging Slides to Support Student Learning, Fall 2017
• Teaching Metacognitive Skills, Fall 2017
• Teaching Inclusively: Fostering a Positive Climate for Learning, Spring 2018
• Grading and Delivering Feedback on Quantitative Assignments, Spring 2018

Mellon College of Science
• Active Learning, Fall 2017

Tepper School of Business
• Delivering Effective Lectures, Spring 2018

We also consult one-on-one with graduate program coordinators and faculty members to help them develop training sessions, TA feedback forms, and other materials for their TAs and graduate student instructors.

Future Faculty Program

Our Future Faculty Program helps gradu-ate students and postdocs develop and document their professional development on teaching, in preparation for a faculty career. Participants who complete the program praise it as giving them a com-petitive advantage in securing faculty positions. The program's requirements are:
• attending at least eight seminars, at least four of which must be designated as core topics
• participating in two teaching feedback consultations (e.g., classroom observation, early course feedback focus group) to receive formative feedback on teaching

TPR 2%

CFA 8%

SCS 15%

Future Faculty
participants by
School/College

MCS 13%

CIT 34%

HNZ 4%

DC 24%
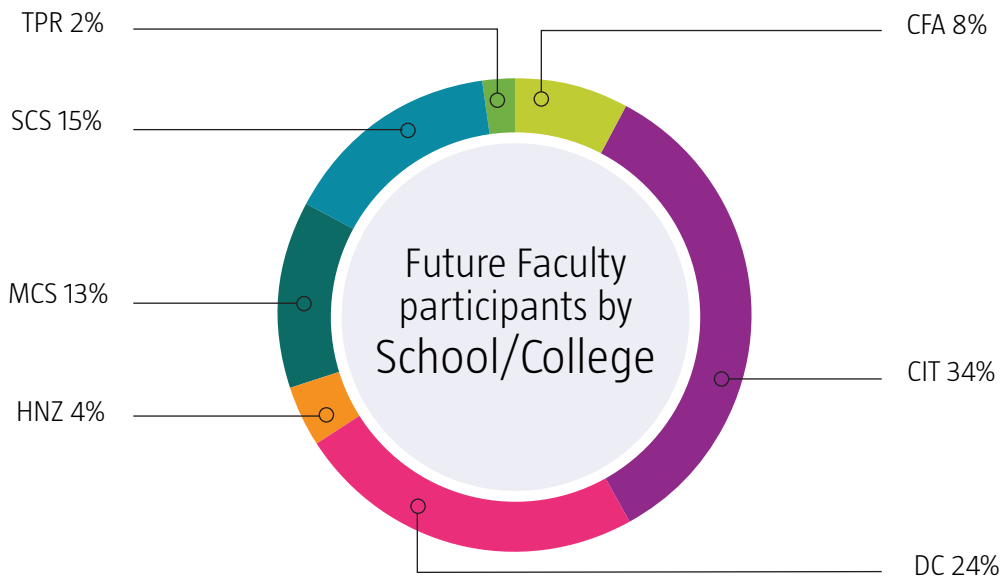
- designing a course and syllabus that align with the participant's discipline and teaching goals
- creating a teaching philosophy statement

Upon completing these four requirements, participants receive a record that lists all of their Eberly activities.

As of June 30th 2018, **189 students were enrolled** in the Future Faculty program. This year the program attracted **55 new graduate students and postdocs**. In AY 2017-2018, **21 students completed the program**.

Invited Orientations

Each August, we participate in both university- and department-level orientations for new graduate students. These orientations are a highly effective means of outreach and generate significant follow-up requests for one-on-one consultations as well as registrations for our seminars and workshops. At the university level, we presented a 50-minute session called "PhD Students and Teaching" that was attended by 133 newly admitted doctoral students. This provided both an overview of our services and evidence-based strategies appropriate for first-time TAs and instructors. We also participated in the Graduate Student Resource Fair during the university-wide orientation for new graduate students that

typically draws several hundred doctoral and master's degree students.

We also presented an overview of our graduate student services to 15 departments, attended by more than 398 new graduate students:

- Architecture
- Biomedical Engineering
- Chemical Engineering
- Computer Science
- Global Communications Center
- Human-Computer Interaction Institute
- Institute for Software Research
- Mathematical Sciences
- Mechanical Engineering
- Modern Languages
- Music
- Philosophy
- Physics
- Psychology
- Statistics

Support for Undergraduate Teaching Assistants

Some departments rely heavily on undergraduate TAs. This year we presented 10 customized unit-level sessions in 3 departments. Approximately 50 unique undergraduate TAs participated in these sessions.
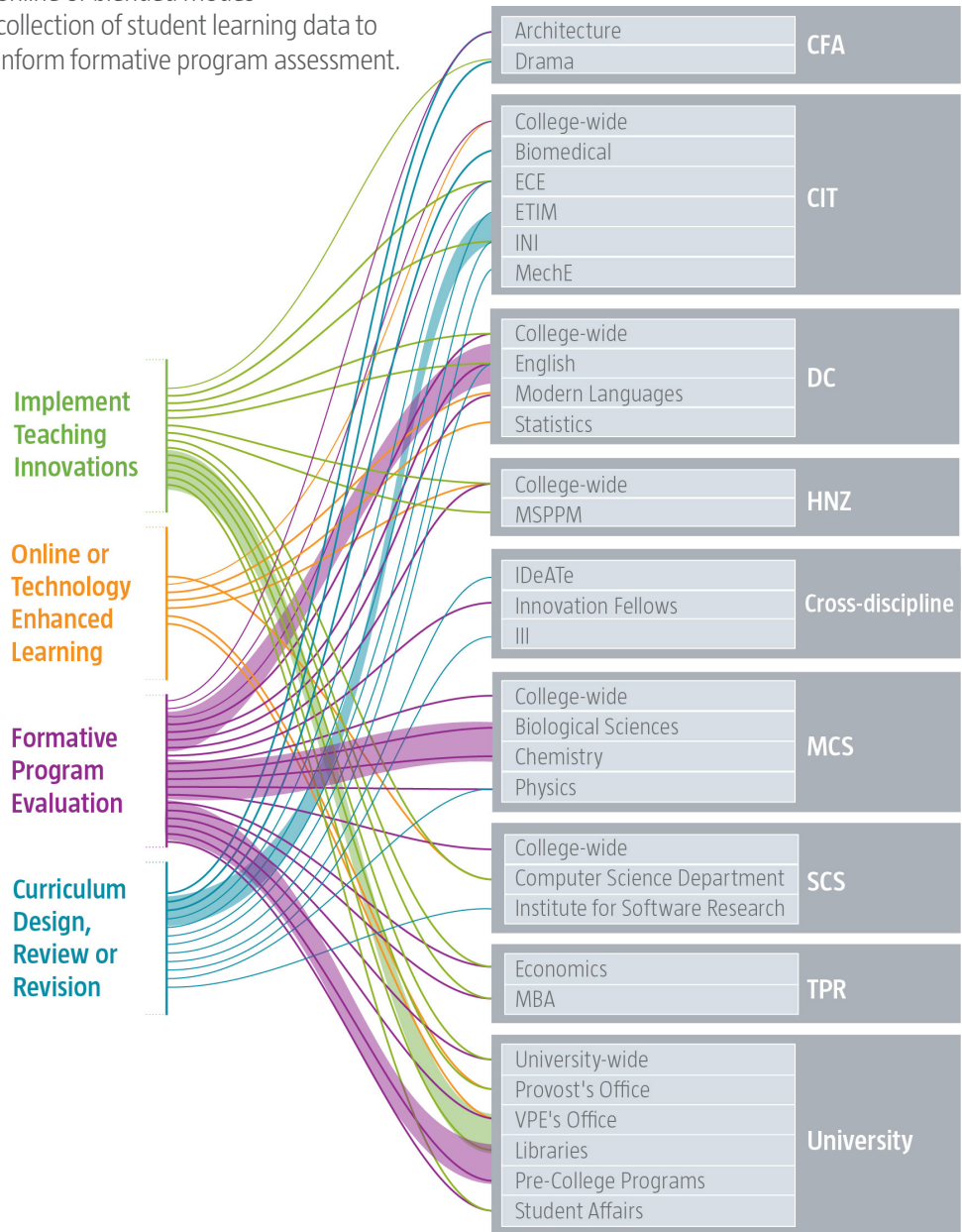
Program-Level Support

The Eberly Center provides customized consultation services to departments, schools, colleges and administrative units to support academic degree programs. For instance, Eberly colleagues help Deans, Department Heads, and groups of faculty to plan and implement program-wide educational activities, including:

- deliberate integration of emerging educational technologies
- iterative review and revision of programs and curricula
- design and preparation for teaching in online or blended modes
- collection of student learning data to inform formative program assessment.

In academic year 2017-18, we provided discipline-specific, program-level consultation services to 109 faculty and staff coordinating 39 CMU academic programs, representing all seven CMU Schools and Colleges, and the Provost's Office. Program-level consultations often involve intensive work, leveraging multiple Eberly services.

We provided **66 discipline-specific, program-level services** to 39 unique programs, representing all seven schools and colleges.

Implement Teaching Innovations

Online or Technology Enhanced Learning

Formative Program Evaluation

Curriculum Design, Review or Revision

| Architecture | CFA |
| Drama | |

College-wide	
Biomedical	
ECE	CIT
ETIM	
INI	
MechE	

College-wide	
English	DC
Modern Languages	
Statistics	

| College-wide | HNZ |
| MSPPM | |

IDeATe	
Innovation Fellows	Cross-discipline
III	

College-wide	
Biological Sciences	MCS
Chemistry	
Physics	

College-wide	
Computer Science Department	SCS
Institute for Software Research	

| Economics | TPR |
| MBA | |

University-wide	
Provost's Office	
VPE's Office	University
Libraries	
Pre-College Programs	
Student Affairs	

Examples of Our Work at the Program Level

Dietrich College: Grand Challenge Courses

The Dietrich College of Humanities and Social Sciences recently created a new Grand Challenge Interdisciplinary Freshman Seminar initiative, significantly expanding its first-year seminar offerings. The new seminars are designed to tackle complicated societal problems from multiple angles and perspectives. These courses take an interdisciplinary approach, and are taught by faculty teams representing multiple disciplines from within the college and across campus.

To support this initiative and its complex and challenging course design efforts, the Eberly Center designed and facilitated a customized faculty special interest group that met twice in Spring 2018. Instructional teams engaged in hands-on, design-based activities to apply evidence-based strategies to their course design, including learning objectives, assessments of student learning, and alignment among teaching strategies, assessments and learning objectives.

An Eberly teaching consultant was embedded in each instructional team during small-group activities, to help facilitate productive discussions and provide support and feedback. After whole-group meetings, instructional teams continued to meet independently with their Eberly consultants, who connected teams with additional Eberly services:

- Early Course Feedback Focus Groups
- consultations on technology-enhanced learning
- consultations on collecting learning data.

Electrical & Computer Engineering

Faculty from the Department of Electrical and Computer Engineering (ECE) reached out to work with Eberly Center assessment specialists in order to take a more systematic and data-driven approach to the ongoing assessment of its undergraduate programs. During the 2017-2018 academic year, ECE faculty and Eberly Center colleagues:

- Implemented pre- and post-assessments to measure students' fundamental knowledge and skills via questions that asked students to define key terms and solve conceptual problems.
- Conducted student focus groups and administered surveys in the introductory and capstone courses.
- Assessed students' capstone projects along multiple dimensions.

Based on the results of these assessments, ECE and Eberly are collaborating on several data-informed enhancements to the program:

- Incorporating new strategies and activities in introductory courses to address gaps and misperceptions in students' knowledge of key ECE terms.
- Developing additional low-stakes practice problems and implementing them online so students can get targeted practice with tailored feedback via educational technology.
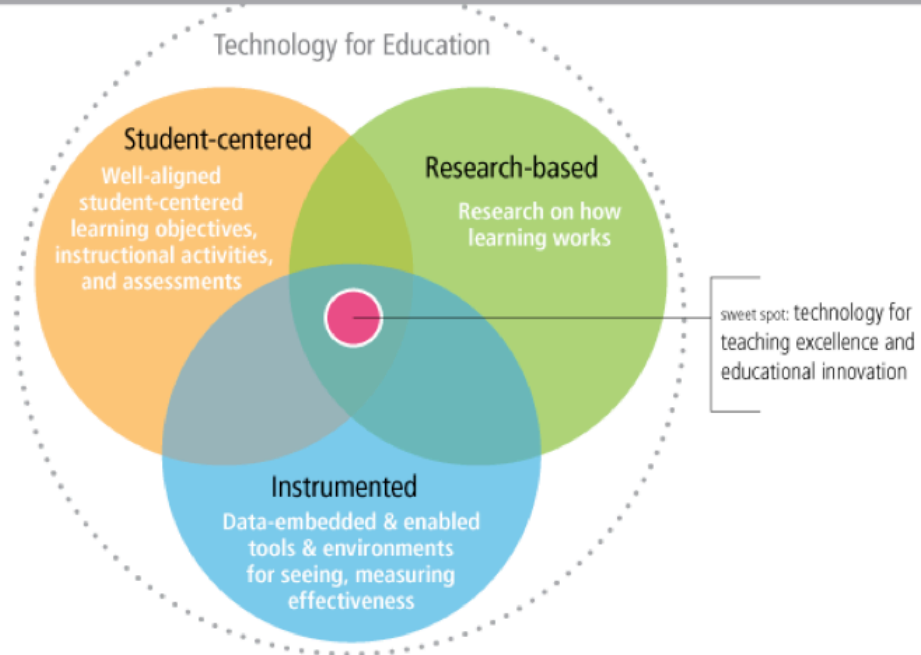
Next steps include (1) refining the pre- and post-assessments and re-administering them next year to measure the impact of these changes on students' learning, and (2) continuing to assess this first-year cohort's development longitudinally across the ECE curriculum. A longer-term goal is to institutionalize these assessment-for-improvement strategies into the department's regular workflows.

"It's been a pleasure working with Eberly Center consultants... They're really helping us as a department reflect on our process, which is going to lead some great improvements in how we teach... "
— *Department Head*

Technology for Teaching, Learning, and Educational Innovation

When Eberly Center looks to the potential of technology for education, we look to these 3 dimensions or enablers:

Technology for Education

Student-centered
Well-aligned student-centered learning objectives, instructional activities, and assessments

Research-based
Research on how learning works

sweet spot: technology for teaching excellence and educational innovation

Instrumented
Data-embedded & enabled tools & environments for seeing, measuring effectiveness

43% of our consultations involved helping faculty teach effectively with technology

In addition, we fielded **3,538** Canvas help desk requests for technical and how-to support

The Eberly Center *brings together key strengths in pedagogy and technology* to fortify and invigorate teaching excellence and educational innovation at CMU. With the ever-changing landscape of educational technology, this union is key to serving the immediate needs and growing aspirations of our teaching community. We continue to fine-tune and grow our portfolio of technology-enhanced learning services and tools.

We supported **149** faculty and staff in their use of technology-enhanced learning (TEL), often providing multiple TEL services.

We consulted with **92** instructors to identify and optimize the match between tools and teaching/learning goals.

We consulted with **23** instructors on effective design and use of instructional videos.

We worked with **84** instructors to develop instructional materials and integrate tools within CMU's TEL ecosystem.

We worked with **42** instructors to develop **32** new TEL tools.

The nature of our TEL work included:

- **Learning engineering** new OLI modules and Canvas courses implementing best practices and measures of learning.
- **Design and production** of multimedia materials for learning, including instructional videos, simulations, interactives.
- **Piloting** Zoom videoconferencing software for educational use (e.g., distance teaching, remote office hours).
- **Software engineering** development of social digital annotation and chat tools.
- **Tool matching** and piloting of new tools for incorporating online peer evaluation.
- **Investigating new tools** to support reflective practice: E-portfolio, blogs, discussion boards, etc.
- **Collaborative development of tools** and integrations for The Simon Initiative, including: The Gallery, The Project Zone, and OLI course environment tools.

Sample TEL Products

Online course development efforts:
- Chinese Learning Game
- Collaborative U
- Conflict U
- Computing for Non-Majors
- Imperative Computing
- Dexign Futures
- DiaGrammar
- Discrete Math Primer
- Robotics
- Eberly-initiated OLI modules to support faculty and graduate student programs:
- Writing Effective Learning Objectives
- TA Training/Grading
- Using Multimedia for Learning

Tool development and integration efforts:
- *DiaGrammar* faculty-developed tool: integration, data hooks
- *Chat* existing tool: customization, integration, data hooks
- *Social Digital Annotation* existing tool: customization, integration, data hooks
- *CloudCoder* existing tool: customization, integration, data hooks
- *Hammock* faculty and Eberly-developed tool: development, integration, data hooks
- *Adobe Captivate* and *Unity* tool integrations for customized learning activities, data hooks

TEL Programs We Delivered

- *TEL Institute*: supporting faculty in designing effective online modules using OLI and Canvas
- *Workshop on Digital Accessibility:* Developing Accessible Course Materials
- Dietrich College *Summer TEL Bootcamp*
- *LearnLab* Summer School - OLI track
- Pittsburgh Council on Higher Education (PCHE) - *Simon Summer Institute*

Tools & Services We Provide

- *Canvas,* learning management system
- *Open Learning Initiative,* online learning environment.
- *Zoom*, video conferencing with whiteboard and recording capabilities.
- *Autolab*, programming assignment autograder.
- *Gradescope*, online grading for written assignments and tests.
- *Turnitin*, plagiarism detection, peer review.
- *Respondus* browser for secure testing.
- *CATME*, group formation and evaluation.
- *Clickers*, classroom response system.
- *Various Learning Tool Integrations (LTI)* including: *NameCoach*, *Piazza*, *Zoom*.

NEW! Syllabus Registry: In order to support theTask Force on the CMU Experience, we developed the Syllabus Registry to make it easy for faculty to upload and dissemate their syllabi to the CMU community.

"Eberly's help with the [online learning tool for my course] has been steadfast and appreciated. Now that my students have seen how they can learn in the online context, they will never let me return to my old methods, even if I wanted to."

– Professor

Transition to Canvas Completed

In Spring 2018, we completed the transition from Blackboard to Canvas, providing Canvas to the full university as our new learning management system. Blackboard courses were archived and that system was removed from access on June 1. We continued our customized faculty support services, including:

- **Canvas Clinics** (regular office hours) for faculty to drop in as needed for in-person support.
- **Small group trainings** where we brought training to departments and small groups upon request.
- **One-on-one Canvas how-to consultations** to address instructor questions and course needs.

4,478 courses created.

Comparing usage of Blackboard to Canvas, we have **31% more courses created.** In addition, we now include CMU Qatar in our Canvas license, aligning systems across campuses—for a 43% increase overall.

Design of Learning Spaces

Eberly Center's Teaching & Learning Laboratory catches the eye with its flexible furniture, interactive monitors, and plenty of collaborative whiteboard space. But don't miss the ceiling's pipe-grid system that is instrumented to facilitate rich data collection on student-student, student-teacher, and student-material interactions.

Faculty from all CMU programs have begun using this space to pilot-test new teaching strategies and educational technologies, to collect data on student learning, to get feedback on their teaching, and to conduct learning science research within real course contexts.

The Eberly Center brings research-backed principles and technology-enhanced learning strategies to design and re-design CMU class-rooms so they function more effectively for teaching and learning. We bring our expertise in pedagogy, technology, and assessment to partner with several other units on learning space design.

Designing spaces to align with modern pedagogies

Incorporating active learning and other evidence-based strategies into one's teaching becomes more challenging when the physical environ-ment was designed long ago based on age-old pedagogies. Ebely colleagues promote learning space designs that will support modern pedago-gies, and are flexible and "future-proofed" to accommodate multiple teaching formats.

Integrating technology to increase learning opportunities and decrease cognitive load

Classroom technology can augment and trans-form learning when it offers new opportunities for active engagement. But to achieve this potential, the cognitive load (or even distrac-tion) from using a new tool must be minimized. We support the effective design of educational technologies and help teachers and students become proficient in using them.

Instrumenting the learning process to enable data-based improvement

We approach learning space design with the same "innovate and iterate" approach we bring to all our work. Once our initial designs are envisioned and implemented, we systematically collect data during "live" classroom interac-tions. These datasets are then used to guide improvements and inform subsequent designs.

In AY2017-18, Eberly engaged in several key projects related to the design, assessment, and improvement of learning spaces:

New Tepper Building:

Three Eberly-designed teaching and learning spaces opened in summer 2018: the Jack & Brigitte McGrath Teaching & Learning Labora-tory, Model TEL classroom, and Legendary Entertainment Innovation Studio. Two of these are instrumented for high-tech data collection.

Informed Classroom Design:

Eberly Center expertise continues to be sought and incorporated during all phases of CMU's $20 million classroom renovation project. We also help translate faculty perspectives into classroom design patterns.
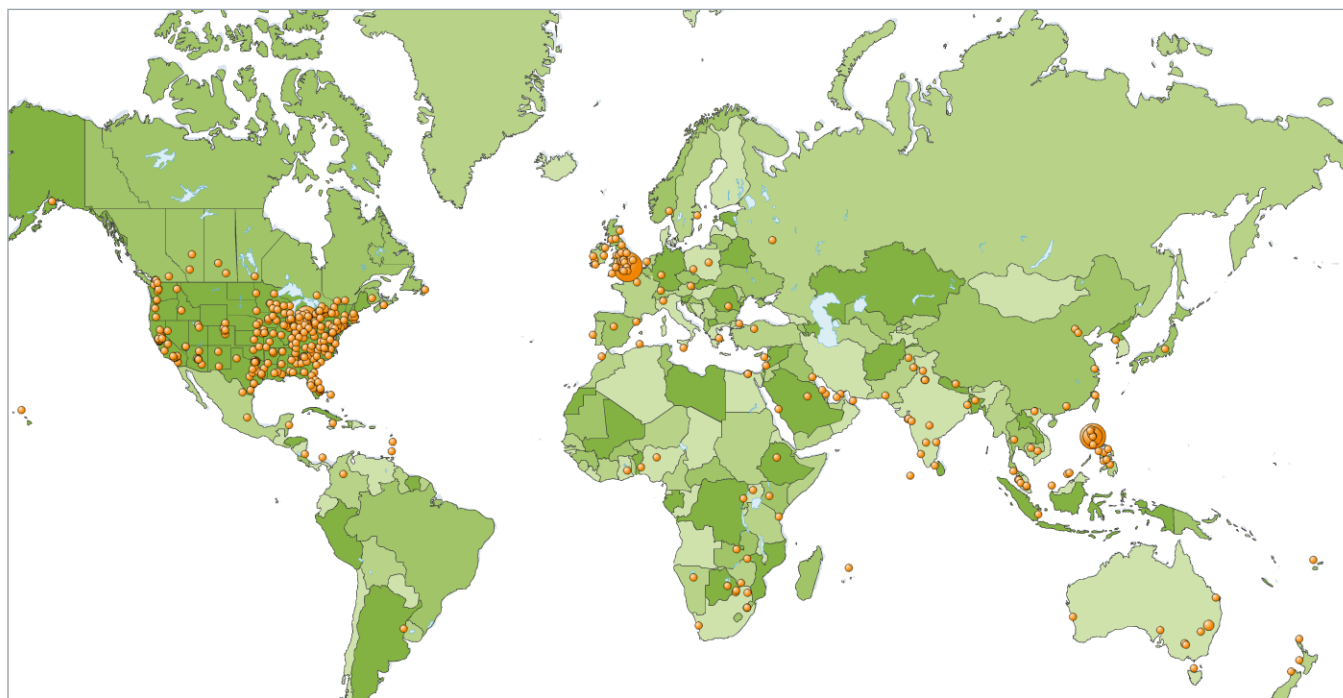
Pre/post data collection:

We have quantitatively and qualitatively assessed a subset of renovated classrooms — before and after they were renovated — by conducting *in vivo* observations and collecting survey data from teachers and students.

"This space simply invites innovation and collaboration!"

— CFA Professor

Eberly Center Website

	AY14-15	AY15-16	AY16-17	AY17-18
Pageviews	3,135,435	3,433,032	3,376,775	2,692,549
Visitors	1,696,208	1,816,940	1,829,374	1,473,790
Visits/Day	5,564	5,967	6,065	4,871

Eberly Center's teaching website is designed to guide instructors through the processes of designing and teaching courses, solving teaching problems, incorporating technology, and assessing student learning.
www.cmu.edu/teaching

The website allows us to support a far broader group of faculty, postdocs, and graduate students — including CMU faculty at overseas campuses and programs — than we could through direct interaction alone.

Top 3 Most Viewed Areas of the Site

39%	Design & Teach a Course
39%	Asessment
13%	Solve a Teaching Problem

Percentages are proportion of all page views.

We leverage the teaching website to respond rapidly to emerging needs by providing targeted, practical resources and support. For example, when Faculty Senate passed a resolution on course syllabi, we created a new web resource on the topic featuring syllabus excerpts from CMU faculty.
www.cmu.edu/teaching/designteach/syllabus/

Other recent additions include sections on:
- Teaching as Research
- Research & Scholarship Digest
- Creating a Supportive Classroom Environment

We believe that a well designed, informative, and user-friendly website is critical to our mission of improving education and supporting CMU colleagues in Pittsburgh and around the world.

"Thank you for making your Eberly website available to the public — so often these pedagogical goldmines are password-protected. Your material represents a resource we could never compile in a small school like ours."

— sent to us from an international educator

Service to the Carnegie Mellon Community

To contribute to the CMU community and educational mission, Eberly Center staff serve on university committees, mentor CMU students, and teach CMU graduate and undergraduate courses. Our service during AY 2017-2018 is listed below.

University Committee Service

Lovett
- Simon Initiative, Co-Coordinator
- ProSEED/Simon Initiative Grant Review Panel, Member
- PIER Steering Committee, Member
- University Education Council, Member
- Associate Deans of Graduate Programs, Member
- Associate Deans Council, Member
- Ryan Award Committee, Chair
- Doherty Award Committee, Co-Chair
- Lazarus Award Committee, Co-Chair
- Mellon College of Science LEAD committee, Co-Chair
- TEL Writing group, Member & Assessment Lead
- Dietrich College General Education Committee, Member & Assessment Committee, Co-Chair
- Formative Assessment of Teaching Working Group, Co-Chair
- Classroom & Learning Spaces Renovations Steering Committee, Member
- Classroom & Learning Spaces Working Group, Member
- Task Force on CMU Experience, Member & Academic Policies, Co-Chair
- Middle States Accreditation, Standard 5, Educational Effectiveness Assessment Committee, Consultant

Hershock
- Teaching Innovation Award Committee, Chair
- Academic Advising Award Committee, Chair
- Graduate Student Teaching Award Committee, Chair
- Middle States Accreditation, Standard 3, Design and Delivery of the Student Learning Experience Committee, Consultant
- Faculty/Staff Working Group: Task Force on the CMU Experience, Member
- Doctoral Mentoring Working Group, Member

Brooks
- Classroom & Learning Spaces Working Group, Member
- Digital Accessibility Working Group, Member
- Dietrich College General Education Committee, Member
- E-Portfolio Working Group, Member

Richards
- Alumni Association Board, Member
- SCS Dean's Masters Student Advisory Council, Member

Walsh
- Graduate Student Concerns Committee, Member
- Graduate Student Teaching Award Committee, Co-Chair

Weiss
- Mellon College of Science, EUREKA! (First-Year Seminar) Committee, Member
- Mellon College of Science, PROPEL (Junior Seminar) Committee, Member

Graduate Student Advising

Lovett
- Anita Delahay, Psychology/PIER, Ph.D. student, advisor
- David Gerritsen, HCII/PIER, Ph.D. student, dissertation committee member
- Amadee Martella, Psychology/PIER, Ph.D. student, co-advisor
- Amy Shannon Cook, HCII/PIER, Ph.D. student, dissertation committee member

CMU Courses and Classes Taught

Hershock
- 19-437: Global Ecological Issues & Controversies, Instructor, Spring '18

Brooks
- 51-371: Dexign Futures, Guest instructor, Fall '17

Richards
- Summer College Preview Program, Qatar, Instructor, Summer '17

External Visibility/Professional Work

For over 30 years, the Eberly Center has been one of the premier teaching and learning centers in US higher education. To maintain the visibility of the Eberly Center and contribute to the national and international dialogue in educational development and the learning sciences, we engage in a variety of professional activities outside of CMU. In addition to publications, awards, and invited presentations, this work includes serving on external committees, boards, and peer-review panels. We also frequently host visiting faculty and administrators from other institutions seeking to learn from the Eberly Center's work.

Peer Reviewed Publications

Delahay, A.B., & **Lovett**, M.C. (2018). Multimedia learning principles at scale predict quiz performance, Proceedings of the Fifth Annual ACM Conference on Learning at Scale, London, UK: L@S.

Erdogmus, H., **Gadgil**, S., & Peraire, C. (2019) Introducing low-stakes just-in-time assessments to a flipped software engineering course. To appear in *Proceedings of 52nd Annual Hawaii International Conference on System Sciences (HICSS).*

Gadgil, S., Braun, M.A., Harty, M., Hovis, K.R., & **Lovett**, M.C. (2018). Investigating the impact of an online collaboration course on students' attitudes and Learning. In Kay, J. and Luckin, R. (Eds.). (2018). *Rethinking Learning in the Digital Age: Making the Learning Sciences Count, 13th International Conference of the Learning Sciences (ICLS)* (Volume 1). London, UK: International Society of the Learning Sciences.

Nokes-Malach, T. J., Zepeda, C. D., Richey, J. E., & **Gadgil**, S. (2019). Collaborative learning: The cost and benefits. *Cambridge Handbook of Cognition and Education*.

External Presentations, Seminars and Workshops

Brooks, J. "Online Course Design" (OLI Track). Learnlab Summer School.

Brooks, J. "Online Course Design". Pittsburgh Council on Higher Education.

Hershock, C. "How Learning Works: Evidence-Based Teaching Strategies", Keynote address, United States Army War College, , PA. July, 2018.

Hershock, C. "Action Research in the Classroom: Collecting Data to Improve Learning Outcomes", Keynote Address at Faculty Forum, Community College of Allegheny County, PA, June 2018.

Hershock, C. "How Learning Works: Evidence-Based Teaching Strategies", Pre-Conference Workshop, 44th Annual National Conference of the Professional Nurse Educators Group (PNEG), Pittsburgh, PA. November, 2017.

Hershock, C., **Lovett**, M., Sanders, M., **Walsh**, K. (2017, October). Evaluating the evidence in "evidence-based": Leveraging research in our work. Pre-conference workshop presented at the annual meeting of the Professional and Organizational Developers Network, Montreal, Canada.

Lovett, M. "Cultivating Growth Mindset for Student Success". Keynote address, Dickinson College (Carlisle, PA). October 2017.

Lovett, M. "Cultivating Growth Mindset". Invited speaker, MERMAID Research Talk Series, School of Nursing, University of Pittsburgh (Pittsburgh, PA). December 2017

Lovett, M. "Promoting Teaching as Research". Invited Panelist, Empirical Educator Summit (Stanford, CA). Feb 2018.

Lovett, M. "Learning Analytics & Educational Innovation". Invited Speaker, Women in Data Science Conference (Pittsburgh, PA). March 2018.

Richards, M. Raspberry Pi Workshop. Transforming Education through Innovation Conference (South Fayette Township School District). November 16, 2017

Walsh, K. "Leveraging Learning Science Research to Promote Long-Term Learning in the Classroom". Faculty Workshop at Catawba College (Salisbury, NC). October 13, 2017

Walsh, K. "How Do Teaching and Learning Differ in Condensed Courses?". POD Conference (Montreal, Quebec). October 2017.

Walsh, K. "Evaluating the Evidence in 'Evidence-Based': Leveraging Research in Our Work", POD Conference (Montreal, Quebec). October 2017

Walsh, K. "Getting and Staying Informed". PODLive! Webinar, April 2018 (with Megan Sanders)

External Committees, Boards and Review Panels

Marsha Lovett
- Advisory Board Member for McGill University's Teaching & Learning Services Center
- Pittsburgh Regional Conference on Teaching & Learning, reviewer
- NSF proposal reviewer for Cyberlearning

Katharine Walsh
- Scholarship Committee, Professional and Organizational Development Network, member
- Conference Presentation Reviewer (Commitee), Professional and Organizational Development Network Annual Conference, reviewer/member

External Colleges and Universities Visiting to Learn About Eberly Center's Work/Approach

- Virginia Tech and the 4VA Consortium (August, 2017)
- Al Akhawayn University in Morocco (November, 2017)
- Stony Brook University (June 2018)
- United States Army War College (June 2018)
- James Madison University (June 2018)

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