

2018

Celebrating 20 Years of the ExCEED Teaching Workshop

Allen C. Estes

California Polytechnic State University, San Luis Obispo

Stephen J. Ressler P.E.

United States Military Academy

Camilla M. Saviz P.E.

University of the Pacific

Brock E. Barry

United States Military Academy

Carol L. Considine

Old Dominion University, cconsidi@odu.edu

See next page for additional authors

Follow this and additional works at: https://digitalcommons.odu.edu/engtech_fac_pubs



Part of the [Civil and Environmental Engineering Commons](#), [Engineering Education Commons](#), and the [Vocational Education Commons](#)

Original Publication Citation

Estes, A. C., Ressler, S. J., Saviz, C. M., Barry, B. E., Considine, C. L., Coward, D., Dennis Jr., N. D., Hamilton, S. R., Hurwitz, D. S., Kunberger, T., Lenox, T. A., Nilsson, T. L., Nolen, L., O'Brien, J. J., O'Neill, R. J., Saftner, D. A., Salyards, K., & Welch, R. W. (2018, June) Celebrating 20 years of the ExCEED Teaching Workshop [Paper presentation]. 2018 ASEE Annual Conference & Exposition, Salt Lake City, Utah. <https://doi.org/10.18260/1-2-30180>

This Conference Paper is brought to you for free and open access by the Engineering Technology at ODU Digital Commons. It has been accepted for inclusion in Engineering Technology Faculty Publications by an authorized administrator of ODU Digital Commons. For more information, please contact digitalcommons@odu.edu.

Authors

Allen C. Estes; Stephen J. Ressler P.E.; Camilla M. Saviz P.E.; Brock E. Barry; Carol L. Considine; Dion Coward; Norman D. Dennis Jr., P.E.; Scott R. Hamilton P.E.; David S. Hurwitz; Tanya Kunberger P.E.; Thomas A. Lenox; Tonya Lynn Nilsson; Leslie Nolen CAE; James J. O'Brien Jr.; Robert James O'Neill; David A. Saftner; Kelly Salyards P.E.; and Ronald W. Welch P. E.

Celebrating 20 Years of the ExCEED Teaching Workshop

Dr. Allen C. Estes, California Polytechnic State University, San Luis Obispo

Allen C. Estes is a Professor and Head for the Architectural Engineering Department at California Polytechnic State University in San Luis Obispo. Until January 2007, Dr. Estes was the Director of the Civil Engineering Program at the United States Military Academy (USMA). He is a registered Professional Engineer in Virginia. Al Estes received a B.S. degree from USMA in 1978, M.S. degrees in Structural Engineering and in Construction Management from Stanford University in 1987 and a Ph.D. degree in Civil Engineering from the University of Colorado at Boulder in 1997.

Dr. Stephen J. Ressler P.E., United States Military Academy

Stephen Ressler, P.E., Ph.D. is Professor Emeritus from the U.S. Military Academy (USMA) at West Point. He earned a B.S. degree from USMA in 1979, a Master of Science in Civil Engineering from Lehigh University in 1989, and a Ph.D. from Lehigh in 1991. As an active duty Army officer, he served for 34 years in a variety of military engineering assignments around the world. He served as a member of the USMA faculty for 21 years, including six years as Professor and Head of the Department of Civil and Mechanical Engineering. He retired as a Brigadier General in 2013. He is a registered Professional Engineer in Virginia, a Distinguished Member of ASCE, and a Fellow of ASEE.

Dr. Camilla M. Saviz P.E., University of the Pacific

Camilla Saviz is Professor and Chair of Civil Engineering at University of the Pacific. She received B.S. and M.S. degrees in Mechanical Engineering from Clarkson University, an M.B.A. from the New York Institute of Technology, and a Ph.D. in Civil and Environmental Engineering from the University of California, Davis. She joined Pacific in 1999 and is a registered Professional Engineer in California.

Dr. Brock E. Barry, United States Military Academy

Dr. Brock E. Barry, P.E. is an Associate Professor and Mechanics Group Director in the Department of Civil & Mechanical Engineering at the United States Military Academy, West Point, New York. Dr. Barry holds a Bachelor of Science degree from Rochester Institute of Technology, a Master of Science degree from University of Colorado at Boulder, and a PhD from Purdue University. Prior to pursuing a career in academics, Dr. Barry spent 10-years as a senior geotechnical engineer and project manager on projects throughout the United States. He is a licensed professional engineer in multiple states. Dr. Barry's areas of research include assessment of professional ethics, teaching and learning in engineering education, nonverbal communication in the classroom, and learning through historical engineering accomplishments. He has authored and co-authored a significant number of journal articles and book chapters on these topics.

Ms. Carol L. Considine, Old Dominion University

Carol Considine is the Assistant Dean for Outreach for the Batten College of Engineering and Technology at Old Dominion University (ODU) and an Associate Professor of Engineering Technology. She has a Bachelor of Science in Civil Engineering from Virginia Tech and a Master of Science in Civil Engineering from University of California, Berkeley. She has fifteen years of industrial experience as an estimator and project manager and is a LEED AP BD+C. She served as chair of the Private Infrastructure Chair for the Hampton Roads Intergovernmental Pilot Project and is a member of the Resiliency Collaborative at ODU. Her research interests include engineering education, industry collaboration, sustainability and resiliency.

Mr. Dion Coward, American Society of Civil Engineers

Dion K. Coward is the Manager of Educational Activities at the American Society of Civil Engineers.

Dr. Norman D. Dennis Jr. P.E., University of Arkansas

Norman D. Dennis, Jr., is a University Professor of Civil Engineering serving as the Senior Associate Dean of the College of Engineering at the University of Arkansas, Fayetteville. Before joining the U of A faculty in 1996, he served in the US Army as an engineer officer for 24 years. During his military career Dennis had the unique opportunity to build roads, airfields and other facilities on five different continents and spend over 11 years as a member of the faculty at the US Military Academy. His current research interests include laboratory and field determination of geotechnical material properties for transportation systems and the use of remote sensing techniques to categorize geohazards. He has published over 85 peer reviewed articles relating to his research and educational activities. Dennis holds BS and MS degrees in Civil Engineering from the University of Missouri-Rolla (now Missouri University of Science and Technology), an MBA from Boston University and a Ph.D. from the University of Texas-Austin. He is a registered professional engineer in Arkansas and Colorado.

Dr. Scott R. Hamilton P.E., York College of Pennsylvania

Scott Hamilton is the Coordinator for the new Civil Engineering Program at York College of Pennsylvania. He is a registered Professional Engineer and has both a MS and PhD in civil engineering and a MS in engineering management from Stanford University as well as a BS from the United States Military Academy, West Point. He is a retired US Army Corps of Engineers officer who has had assignments in the US, Germany, Korea, and Afghanistan. During his military career he spent over 10 years on the faculty at the US Military Academy at West Point teaching civil engineering. He has also served as the Director, Graduate Professional Development at Northeastern University's College of Engineering.

Dr. David S. Hurwitz, Oregon State University

Dr. David Hurwitz is an Associate Professor of Transportation Engineering, Director of the OSU Driving and Bicycling Simulator Laboratory, and Associate Director of the Pacific Northwest Transportation Consortium in the School of Civil and Construction Engineering at Oregon State University. Dr. Hurwitz conducts research in transportation engineering, in the areas of transportation safety, human factors, traffic control devices, and engineering education.

Dr. Tanya Kunberger, Florida Gulf Coast University

Dr. Kunberger is an Associate Professor in the Department of Environmental and Civil Engineering in the U. A. Whitaker College of Engineering at Florida Gulf Coast University. Dr. Kunberger received her B.C.E. and certificate in Geochemistry from the Georgia Institute of Technology and her M.S. and Ph.D. in Civil Engineering with a minor in Soil Science from North Carolina State University. Her areas of specialization are geotechnical and geo-environmental engineering. Educational areas of interest are self-efficacy and persistence in engineering and development of an interest in STEM topics in K-12 students.

Dr. Thomas A. Lenox, American Society of Civil Engineers (Retired)

Thomas A. Lenox, Ph.D., Dist.M.ASCE, F.ASEE is Executive Vice President (Emeritus) of the American Society of Civil Engineers (ASCE). He holds a Bachelor of Science degree from the United States Military Academy (USMA), Master of Science degree in Theoretical & Applied Mechanics from Cornell University, Master of Business Administration degree in Finance from Long Island University, and a Ph.D. degree in Civil Engineering from Lehigh University. Dr. Lenox served for over 28 years as a commissioned officer in the U.S Army Field Artillery in a variety of leadership positions in the U.S., Europe, and East Asia. He retired at the rank of Colonel. During his military career, Dr. Lenox spent 15 years on the engineering faculty of USMA – including five years as the Director of the Civil Engineering Division. Upon his retirement from the U.S. Army in 1998, he joined the staff of the American Society of Civil Engineers (ASCE). In his position as educational staff leader of ASCE, he managed several new educational initiatives – collectively labeled as Project ExCEED (Excellence in Civil Engineering Education). As ASCE's Executive Vice President, Dr. Lenox led several educational and professional career-development projects for the civil engineering profession – with the overall objective of properly preparing individuals for their futures as civil engineers. An example is his staff leadership of ASCE's initiative to "Raise the

Bar” for entry into professional engineering practice. Dr. Lenox’s awards include ASCE’s ExCEED Leadership Award, ASEE’s George K. Wadlin Award, ASCE’s William H. Wisely American Civil Engineer Award, and the CE News’ ”2010 Power List – 15 People Advancing the Civil Engineering Profession.” He is a Distinguished Member of ASCE and a Fellow of ASEE. In January 2014, Dr. Lenox retired from his staff position with ASCE. He continues to serve the engineering profession as an active member of ABET’s Board of Delegates, Global Council, and Governance Committee; several of ASCE’s education and accreditation committees; and ASEE’s Civil Engineering Division.

Dr. Tonya Lynn Nilsson P.E., Santa Clara University

Tonya Nilsson is a Senior Lecturer in Civil Engineering at Santa Clara University (SCU), where she is also one of six Faculty Associates in their Collaborative for Teaching Innovation. Prior to joining SCU, Tonya was an Associate Professor at CSU - Chico.

Ms. Leslie Nolen CAE, American Society of Civil Engineers

Leslie Nolen, CAE, serves as director, educational activities for the American Society of Civil Engineers. She brings nearly 20 years of association management experience to her work with ASCE’s Committee on Education on issues of importance to the undergraduate and graduate level education of civil engineers.

Mr. James J. O’Brien Jr., American Society of Civil Engineers

JIM O’BRIEN

Jim O’Brien has over 44 years of experience as a leader, team builder, and manager in diverse professional and academic environments. During his 26-year military career in the US Army Corps of Engineers, he commanded combat engineer units and served 13 years on the teaching faculties of the United States Military Academy at West Point, the US Army’s Command & General Staff College, and the University of Notre Dame.

Now retired from the US Army, Jim currently serves as the American Society of Civil Engineers’ Managing Director of Leader Development. Here, he serves as the staff leader to ”raise the bar” on civil engineering formal education and experience prior to licensure. Jim joins others in the sustainability community seeking to change the CE Profession to make all civil work sustainable. He continues other opportunities in teaching university teachers to be better teachers through ASCE’s ExCEED (Excellence in Civil Engineering Education) Teaching Workshop and in ABET accreditation of engineering programs. In addition to Leader Development, his portfolio also includes Educational Activities, Professional Activities, Raise the Bar, and Sustainability Departments.

Jim is also an adjunct faculty member at George Mason University where he teaches leadership and leading change in the Applied Information Technology MS graduate program.

Jim is a lifelong learner, seeking to continually improve and reinvent himself. His passions include leadership, mentoring, professionalism, personal responsibility, non-verbal communication, and teaching effectiveness. He strives to always ”Be Intentional”—that is, to do everything for a reason.

Dr. Robert James O’Neill, Florida Gulf Coast University

Dr. ROBERT (BOB) J. O’NEILL is Professor and Chair of the Department of Environmental and Civil Engineering, U.A. Whitaker College of Engineering, Florida Gulf Coast University. He received a B.S. from the United States Military Academy in 1975, an M.S. in Structural Engineering and an M.S. in Geotechnical Engineering from Stanford University in 1984 and a Ph.D. in Structural Engineering from Kansas State University in 1993. Prior to his coming to FGCU he was a Professor of Engineering at Roger Williams University and an Associate Professor and Director of the Civil Engineering Analysis Group at the United States Military Academy. Dr. O’Neill is a retired Lieutenant Colonel, U.S. Army Corps of Engineers. He has been active at the national level with ASCE’s Technical Council on Computing and Information Technology (TCCIT), Committee on Faculty Development (CFD) and Excellence in Civil Engineering Education (ExCEED) initiative. Dr. O’Neill is a licensed Professional Engineer in California,

Florida, Nevada and Virginia. He is a civil engineering program evaluator for the Accreditation Board for Engineering and Technology (ABET). He is an American Society of Civil Engineering Fellow (ASCE), a member of the American Society for Engineering Education (ASEE), and Phi Kappa Phi National Honor Society.

Dr. David A. Saftner, University of Minnesota, Duluth

David Saftner is an Associate Professor at the University of Minnesota Duluth. He received a BS in Civil Engineering from the United States Military Academy and MS and Ph.D. in Civil Engineering from the University of Michigan.

Dr. Kelly Salyards P.E., Bucknell University

Dr. Salyards is an Associate Professor in the Department of Civil and Environmental Engineering at Bucknell University. She has BAE, MAE, and PhD degrees in Architectural Engineering from The Pennsylvania State University. She joined Bucknell in 2007 and is a registered Professional Engineer in Pennsylvania. Her teaching interests range from fundamental engineering mechanics to structural design in both steel and concrete. She is currently serving on ASCE's Committee on Faculty Development.

Dr. Ronald W. Welch P.E., The Citadel

Ron Welch (P.E.) received his B.S. degree in Engineering Mechanics from the United States Military Academy in 1982. He received his M.S. and Ph.D. degrees in Civil Engineering from the University of Illinois, Champaign-Urbana in 1990 and 1999, respectively. He became the Dean of Engineering at The Citadel on 1 July 2011. Prior to his current position, he was the Department Head of Civil Engineering at The University of Texas at Tyler from Jan 2007 to June 2011 as well as served in the Corps of Engineers for over 24 years including eleven years on the faculty at the United States Military Academy.

Twenty Years of Project ExCEED: Assessing the Impacts and Charting the Future

Abstract

In response to the clear need for faculty training, the American Society of Civil Engineers (ASCE) developed and funded Project ExCEED (Excellence in Civil Engineering Education) which is celebrating its twentieth year of existence. For the past two decades, 38 ExCEED Teaching Workshops (ETW) have been held at six different universities. The program has 910 graduates from over 267 different U.S. and international colleges and universities. The ExCEED effort has transformed from one that relied on the grass roots support of its participants to one that is supported and embraced by department heads and deans. This paper summarizes the history of Project ExCEED, describes the content of the ETW, assesses its effectiveness, highlights changes in the program as a result of the assessment, and outlines the future direction of the program.

Introduction

In 1998, the American Society of Civil Engineers (ASCE) launched a major faculty development initiative called Project ExCEED—Excellence in Civil Engineering Education. In July of the following year, implementation of Project ExCEED began with the first ExCEED Teaching Workshop (ETW), an intensive five-day learning experience designed to provide 24 participants with the knowledge, skills, and motivation to become better teachers. Over the following 19 years, Project ExCEED has grown, diversified, and continuously improved, while producing consistently positive outcomes. During the period from 1999 to 2018:

- 910 civil engineering faculty members from 267 different institutions have graduated from ETW.
- 200 faculty members—most of whom are ETW graduates—have served as instructors or mentors for the workshop.
- The workshop's core learning objectives and instructional design have remained unchanged, even as the specific program of instruction has undergone near-continuous evolution, in response to participant feedback, scholarly self-assessment, and the changing nature of engineering education.
- ETW has received continuously positive participant feedback and achieved consistently strong learning outcomes.
- Positive outcomes of ETW have engendered strong support from civil engineering department heads and engineering deans, while also ensuring that the number of workshop applications has consistently exceeded the available number of seats.
- A two-day Mini-ExCEED Teaching Workshop has been developed and offered at numerous institutions.
- An advanced version of ETW, called ExCEED II, has been developed and implemented.
- Over 60 civil engineering faculty members have been recognized for teaching excellence and leadership through the ExCEED awards program.
- A large number of ETW graduates and workshop faculty have formed an informal community of practice, devoted to the promotion of excellence in civil engineering

education—though the scholarship of teaching and active engagement in both the American Society for Engineering Education (ASEE) and ASCE educational activities.

- ASCE continues to support, financially and through significant staff effort, offering ETW on an annual basis

In the summer of 2018, ASCE will conduct three ETWs—one at the U.S. Military Academy, one at Florida Gulf Coast University, and one at the University of Nebraska. Collectively, these three events will constitute the 20th year of Project ExCEED—an appropriate milestone for documenting the history and assessing the implementation and impact of this program while also charting its future course.

Purpose and Scope

The purpose of this paper is to document Project ExCEED to date from a historical perspective and to present the preliminary results of a comprehensive project aimed at addressing two research questions:

- (1) To what extent has Project ExCEED influenced civil engineering education in the U.S.?
- (2) What should be the future direction of Project ExCEED?

In this paper, we present a summary and analysis of a large quantity of *existing data*, which have been collected from ExCEED workshops conducted over the past 19 years. In a future paper, we will incorporate the results of extensive follow-up surveys of ETW participants, mentors, and instructors, as well as department heads and deans. These surveys, which are currently in progress, will serve as the basis for comprehensive answers to the two research questions above.

Historical Overview of Project ExCEED

In the 1980s and 1990s, ASCE conducted a Civil Engineering Education Conference once every five years, for the purpose of identifying major issues and challenges in civil engineering education and proposing educational reforms and initiatives to address these challenges. At the 1995 Civil Engineering Education Conference, 235 participants considered a wide range of issues and collectively identified four major areas for focused action by ASCE: (1) faculty development, (2) an integrated curriculum, (3) practitioner involvement in education, and (4) the first professional degree.¹

Following the 1995 conference, the ASCE Educational Activities Committee (EdAC) assumed responsibility for the faculty development issue area. EdAC proposed to the ASCE Board of Direction that a standing Committee on Faculty Development be established and provided with funding to plan and implement a teaching effectiveness workshop. This proposal was reinforced through a visioning process conducted by EdAC in 1998.

That year, the vision became a reality as the ASCE Committee on Faculty Development (CFD) was established as a constituent committee of EdAC. CFD was charged with planning and implementing a comprehensive faculty development initiative, which was to include the development of teaching effectiveness workshops and seminars, faculty recognition programs,

and a directory of information resources for engineering faculty development.² This initiative—dubbed Project ExCEED—was funded at \$150,000 annually for Fiscal Years 1999 and 2000.

At its initial meeting in November 1998, CFD gave priority of effort to the development of a teaching effectiveness workshop, which was to be offered just eight months later, in the summer of 1999.³ To design this workshop, CFD first examined a range of *existing* faculty development programs, including:

- The National Effective Teaching Institute (NETI), a three-day seminar developed in 1991 by Professor Richard Felder and offered annually in conjunction with the ASEE Annual Conference.⁴
- The Teaching Teachers to Teach Engineering (T⁴E) Workshop, a five-day performance-oriented short course developed by faculty from the U.S. Military Academy (USMA) at West Point, funded by the National Science Foundation (NSF), and offered annually at USMA from 1996 to 1998.⁵
- Faculty development workshops developed by the NSF-funded Foundation Coalition.
- A mentorship program developed for doctoral candidates at Virginia Tech.

Of these alternatives, CFD determined that the T⁴E workshop format was most consistent with the goals of Project ExCEED—particularly because of its strong focus on improving teaching performance through small-group learning, practice classes, and individualized feedback.

Given the limited time available, CFD decided that the design of the 1999 ExCEED Teaching Workshop would be based on the T⁴E model and that the T⁴E team at USMA would be charged with planning and implementing this first edition of ETW. However, recognizing that the T⁴E model might need to be adapted to meet ASCE's long-term needs for Project ExCEED, CFD also decided that the inaugural ETW would be rigorously assessed by an independent team of experts, who would then make recommendations for the design of future editions of ETW.

The mechanism for performing this assessment was the Program Design Workshop (PDW), implemented by a team of nine consultants selected by CFD through an open application process. The PDW met at West Point in July 1999, concurrent with the inaugural ETW. PDW members observed the ETW's key learning activities, met with ETW faculty and participants, and reviewed participants' end-of-workshop assessments. The team then prepared a scholarly report documenting its findings and recommendations. This report validated the fundamental instructional model embodied in the original ETW but recommended several substantive changes to the workshop structure and content to enhance its effectiveness and transportability.⁶ The report included a complete implementation plan for organizing, resourcing, conducting, and assessing future annual ETWs at multiple sites.

Workshop Results

The effectiveness of the plan prepared by the Program Design Workshop is shown in Table 1, which summarizes all of the ASCE ETWs conducted from 1999 to the present. During twenty years of ExCEED, ASCE has conducted a total of 38 workshops at six different host institutions. Of the 910 total ETW participants, 899 were from U.S. institutions, and the others were faculty

members from universities in Ireland, Colombia, Hong Kong, South Africa, Canada, Spain and Afghanistan. Because of ETW's strong emphasis on practice and individualized feedback, most of these workshops could accommodate only 24 participants—even though all had significantly larger numbers of applicants, as shown in Table 1.

Table 1 also tracks the two-decade transition of the ETW from an effort largely supported by ASCE to one that has been embraced by deans and department heads, showing the essential value provided by the workshop. There has been a dynamic tension with regard to workshop funding. After the T⁴E NSF grant expired in 1998, ASCE supported the workshop through a financial grant from the Bechtel Corporation. In 2002 and 2003, ASCE hosted three workshops at three different host institutions. During this period while the workshop was still developing its reputation, participants were charged no registration fee and for two years (2002 and 2003) were granted a \$50 per day stipend to offset their travel and lodging costs. Even with these incentives, the number of applications did not quite justify three workshops per year. When the Bechtel grant support ended after 2003, ASCE partnered with ASME, AIChE, and IEEE through the United Engineering Foundation to fund an Ex^cEEd (Excellence in Engineering Education) workshop that followed the same format as ETW, but included participants from other engineering disciplines. While the sister societies lauded the workshop, they were not willing to provide financial support for it to continue in this multi-disciplinary format beyond 2004.

In 2005, ASCE primarily funded the ETW out of operational funds and supported two workshops per year. At this point, participants were asked to pay a registration fee to help share the cost of this workshop using personal funds, support from their home institutions, or other sources. While ASCE continued to look for outside financial support for the workshop, the funding and number of applications reached a steady-state from 2005 through 2012. During this period, ASCE funded two workshops, and participants were asked to pay a fee--roughly covering 20% of their cost to participate in the workshop. In an effort to reduce the budget in 2013, ASCE provided funding for only one ETW, despite continued strong demand. ASCE has provided approximately \$120,000 per year to support ETW. Although the value to student learning and the future of the profession is clearly evident, members of the ASCE Board of Direction have had different opinions on the need to fund the workshop to this extent, given other funding needs and priorities at ASCE. CFD continues to advocate for sufficient funding to ensure that the cost of participation is comparable to the cost of attending a professional conference. Based on very strong support from deans, department heads, and potential participants, ASCE has continued to sponsor and staff two workshops each year since 2014. The testimonials from past participants who celebrated the benefits of the program were also compelling. ASCE has always provided strong support--in terms of both funding and time--to this program. The ASCE President, President-Elect, and Executive Director have visited the workshop (Figure 1), and these ASCE leaders have been the graduation speaker at an ETW virtually every year.

Year	Host Institution	# Applications	Available slots	Funding Sources
1999	USMA	29	24	\$0 charge per participant, ASCE provided \$600 stipend per participant
2000	USMA	76	24	\$0 charge per participant, ASCE provided \$600 stipend per participant
	University of Arkansas		24	
2001	USMA	53	24	\$0 charge per participant
	University of Arkansas		24	
2002	Northern Arizona University	95	24	\$0 charge, \$250 stipend per participant Bechtel grant
	USMA		24	
	University of Arkansas		24	
2003	USMA	85	24	\$0 charge, \$250 stipend per participant Bechtel grant
	University of Arkansas		24	
	Northern Arizona University		24	
2004	USMA	68	24	\$0 charge per participant United Engineering Foundation (UEF) support
	University of Arkansas		24	
2005	USMA	59	24	\$425 charge per participant Bechtel grant
	University of Arkansas		24	
2006	USMA	65	24	\$425 charge per participant Bechtel grant
	University of Arkansas		24	
2007	Northern Arizona University	81	24	\$425 charge per participant Bechtel grant
	USMA		24	
2008	USMA	92	24	\$425 charge per participant Support from ASCE; Bechtel grant
	University of Arkansas		24	
2009	Northern Arizona University	89	24	\$425 charge per participant Support from ASCE; Bechtel grant
	USMA		24	
2010	USMA	64	24	\$425 charge per participant Support from ASCE via ASCE Foundation
	University Of Colorado, Boulder		24	
2011	USMA	74	24	\$425 charge per participant Support from ASCE via ASCE Foundation
	University of Texas, Tyler		24	
2012	USMA	83	24	\$425 charge per participant Support from ASCE via ASCE Foundation
	Florida Gulf Coast University		24	
2013	Florida Gulf Coast University	92	24	\$495 charge per participant Support from ASCE via ASCE Foundation
2014	USMA	87	24	\$495 charge per participant Support from ASCE via ASCE Foundation
	Florida Gulf Coast University		24	
2015	USMA	96	24	\$595 charge per participant Support from ASCE via ASCE Foundation
	Florida Gulf Coast University		24	
2016	USMA	127	24	\$650 charge per participant Support from ASCE via ASCE Foundation
	Florida Gulf Coast University		24	
2017	USMA	120	28	\$1,000 charge per participant Support from ASCE via ASCE Foundation
	Florida Gulf Coast University		28	
2018	USMA	114	24	\$1,000 charge per participant Support from ASCE via ASCE Foundation Support from Durham School, Univ of Nebraska
	Florida Gulf Coast University		24	
	University of Nebraska		24	

Table 1. ExCEED Teaching Workshops conducted from 1999 to the present



Figure 1. ASCE President Kristina Swallow delivers the graduation speech and awards certificates to participants and ETW staff at the 2017 ETW at Florida Gulf Coast University

Due to the increasing cost of hosting the workshops, the registration fee has increased to more equally share the cost. The current challenge is that the number of applications has grown to the point that three workshops are needed to meet the demand. In 2016, the ASCE Department Heads Coordinating Council requested that CFD address this demand, even if it increases the cost to participants. To meet the increased demand, CFD did a pilot study by increasing the number of participants to 28 at each of two ETW sites in 2017 with no change in funding from ASCE. This raised the registration fee to \$1000 per participant, but allowed eight additional participants to complete the program. Post-workshop assessments indicated no significant negative effects on the participants' workshop experience--a testament to the effort put forth by the workshop coordinators and staff. ASCE will offer three ETWs in 2018, reflecting the continued strong demand for the program as its 20th anniversary approaches. The third workshop is made possible through generous funding from the Durham School at the University of Nebraska, Omaha where the third workshop will be hosted. The ExCEED demand as defined by number of applications received is shown in Figure 2 as well as in Table 1.

In total, 267 different institutions have sent faculty members to ETW. The eleven universities with the most ETW graduates are listed in Table 2. Given these institutions' high level of participation in Project ExCEED, it is evident that ETW represents an important contributor to civil engineering faculty development at these schools.

Workshop participants' levels of teaching experience have ranged from zero (i.e., have taught no classes to date and are just preparing for their first semester) to those who have over 20 years of experience or who have begun a career in academia after a career as an engineering practitioner. ETW participants' average teaching experience level is 3.4 years, with the distribution shown in Figure 3. The largest category represented are those with one to three years of teaching experience, comprising 42% of ETW participants. The ETW population has been roughly 30% women and 70% men over its 20 years of existence. The percentage of women has grown slightly over the past five years.

Figure 4 shows the nature of the universities that have sent participants to this workshop. Approximately three-quarters of the participating universities have been public rather than private. Almost half of the universities have been doctorate-degree schools which place a heavy emphasis on research as well as teaching. The complete listing of participating universities, the number of participants, and their Carnegie classification are in Appendix B.

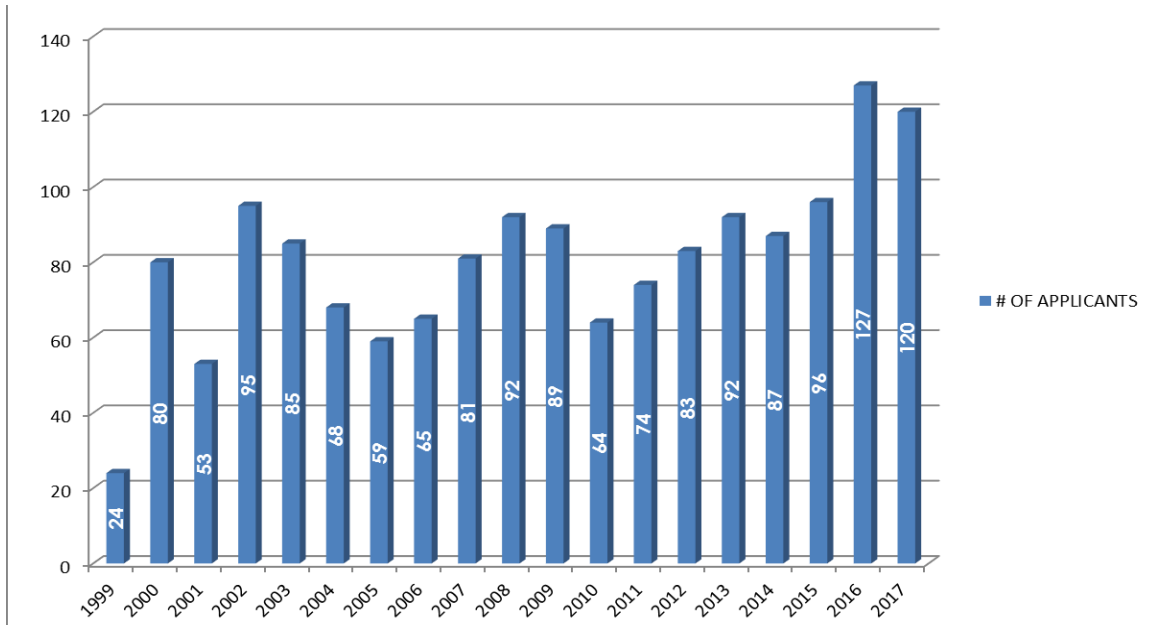


Figure 2: Number of ExCEED applicants from 1999 to 2017

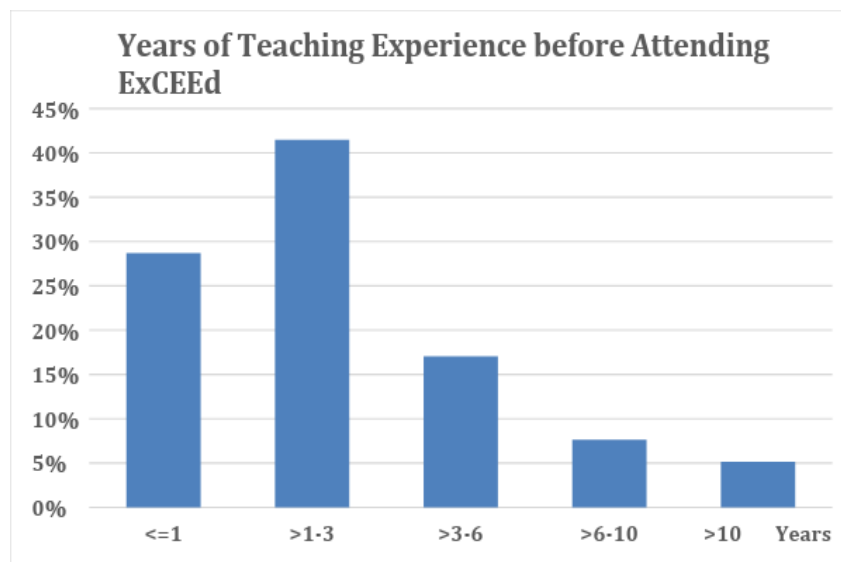


Figure 3: The number of years of teaching experience of ETW participants

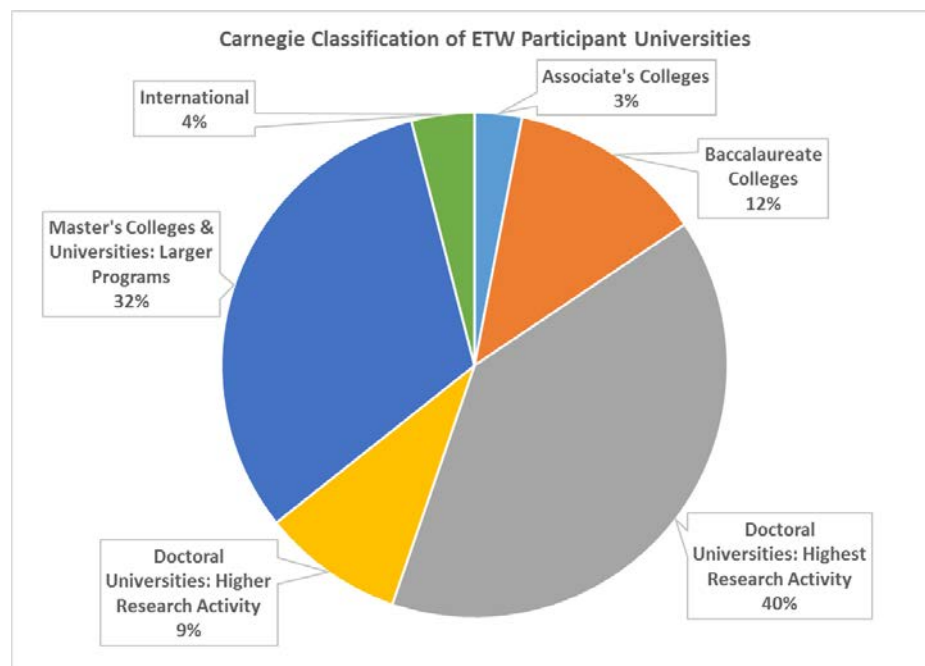
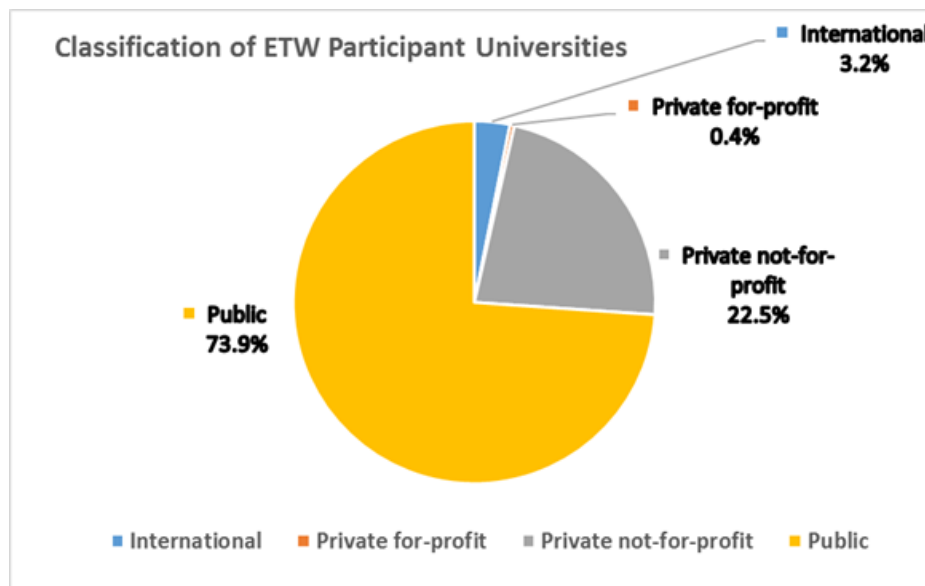


Figure 4: Types of universities participating in the ETWs

With the increasing demand for ETW, CFD has put considerable thought and effort into choosing candidates in this highly competitive process. The application requires a statement of teaching philosophy, how the ETW will meet the applicant's professional needs, and how the applicant will contribute to the improvement of teaching at his or her own institution. The department chair must also complete a statement of support that comments on the applicant's needs, motivation, and ability to contribute to improvement of teaching. CFD members evaluate and rank-order the applicants based on the quality of these files. CFD also considers whether an applicant has previously applied, years of teaching experience, location preference, number of

applications from the same university, and whether the applicant's university has previously had a faculty member attend. The decisions have become more difficult as the quality of applicant submissions have improved over the years. In addition, CFD members consider who might benefit more from attending the workshop, recognizing that some application materials may be stronger than others based on applicants' background and experience. Similarly, a department chair with no previous applicants is less familiar with the ETW and might write a weaker statement of support. The CFD attempts to create a group of workshop participants who are motivated, will attain maximum benefit from the experience, and are diverse in terms of academic discipline, gender, location, and university.

	Institution	Grads
1	California Polytechnic University, San Luis Obispo	18
2	Texas A&M University	16
3	Texas Technological University	14
4	Clemson University	13
5	The University of Texas-Austin	13
6	Washington State University	13
7	Colorado State University	12
8	Florida Gulf Coast University	12
9	Southern Illinois University, Edwardsville	12
10	University of Arkansas, Fayetteville	12
11	Virginia Tech	12
	TOTAL =	147

Table 2. Universities with the largest number of ETW graduates

The Instructional Design of ETW

Consistent with the primary goal of ASCE's faculty development initiative—improving teaching skills—the learning objectives of ETW have been defined as follows:

- Explain what constitutes effective teaching.
- Apply Felder's learning styles model to the organization and conduct of a class.
- Use classroom assessment techniques to assess student learning.
- Organize a class.
- Deliver classroom instruction.
- Assess a class from a student's perspective.
- Self-assess your own class.

To achieve these objectives, the overall design of ETW has been derived from a research-based conceptual model of the human learning process, developed by Apple et al. to enhance students' skills as self-learners.⁷ As adapted for Project ExCEED, this Model Instructional Strategy consists of eight major steps representing the critical elements of a high-quality learning experience, as illustrated in Figure 5.⁸

The structure of ETW incorporates three types of learning experiences—seminars, demonstration classes, and labs—each of which fulfills a portion of the Model Instructional Strategy.

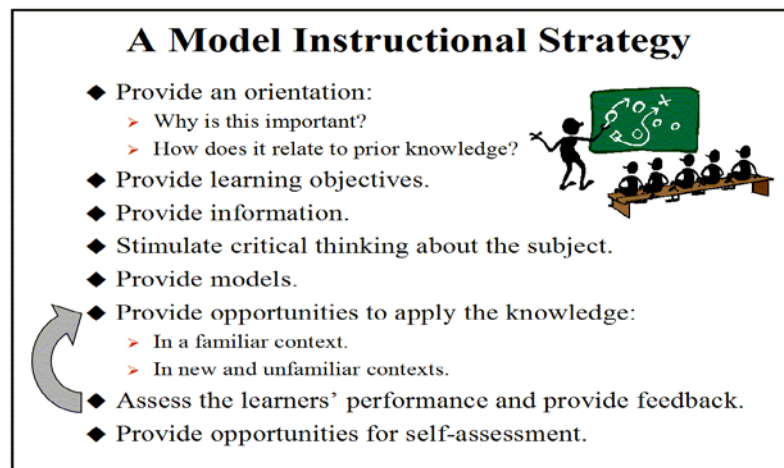


Figure 5. Model Instructional Strategy on which the design of ETW is based

Seminars are the principal means of delivering content in ETW. Each of these sessions is taught by a subject-matter expert to all workshop participants in a single room. Material for the ETW seminars is drawn primarily from references^{9,10,11,12} and from the broader peer-reviewed literature on teaching and learning. With respect to the Model Instructional Strategy, seminars are used to *orient* participants to the subject matter, provide *learning objectives*, and communicate basic *information*. These sessions are also used to stimulate critical thinking, through integrated small-group activities, questioning, and discussions (Figure 6).



Figure 6: The ETW seminars provide course content in a manner that is compelling and engaging to all 24 participants

Demonstration classes are 60-minute engineering classes, each taught by a master teacher, with all ETW participants role-playing as undergraduate students, i.e., taking notes, asking and answering questions, and participating in group exercises. The principal purpose of these demonstrations is to provide *models* of teaching excellence—to illustrate the application of all ETW concepts, tools, and techniques in the context of typical undergraduate engineering instruction (Figure 7). Through these demonstration classes, participants are also introduced to the processes of assessment and feedback used throughout ETW.



Figure 7: Audra Morse relies on participants to illustrate an engineering concept using a physical model during Demonstration Class II

Labs are hands-on activities in which ETW participants directly apply the concepts, tools, and techniques learned in the seminars and then receive detailed, constructive, individualized feedback on their performance. For all labs, participants are organized into teams of four; and each team is guided by an experienced faculty mentor and one or more assistant mentors. The most important labs in ETW are three practice classes, which each participant must prepare and deliver to the remaining members of his or her team (Figure 8). In forming teams, the workshop coordinators intentionally form diverse groups comprising faculty from different sub-disciplinary areas of civil engineering, different types of home institutions, and different cultural backgrounds. This creates a more realistic undergraduate classroom environment, especially in the level of questions that can be asked and answered in the practice classes.

Each practice class addresses an engineering subject of the participant's own choosing, and each is followed by a formal assessment, using a specially formulated ETW Teaching Assessment Worksheet (see Appendix A). The first of these three assessments is performed by the mentor; the second is performed by the participant's peers; and the third is a self-assessment. Through this structured progression, participants demonstrate their achievement of the ETW learning

objectives, while also developing the self-assessment skills that will be essential for their continued development when they return to their home institutions following the workshop.



Figure 8: ETW Participants are encouraged to come outside their comfort zones during the practice classes

The Evolution of ETW Content

Over the past 20 years of Project ExCEED, the fundamental instructional design of ETW has been repeatedly validated—first by the ASCE Program Design Workshop, then by each successive cohort of ETW participants and faculty as discussed in the Participant Feedback section of this paper. Given this validation, the instructional design of ETW has remained essentially unchanged since 1999. On the other hand, the specific content of ETW has evolved considerably over this same period.

The inaugural ETW, conducted in 1999, included the following twelve seminars:

- Learning to Teach
- Principles of Effective Teaching and Learning
- Teaching Assessment
- An Introduction to Learning Styles
- Learning Objectives
- Planning the Class
- Classroom Assessment Techniques
- Communication Skills: Writing and Speaking
- Communication Skills: Questioning

- Teaching with Technology
- Making It Work at Your Institution
- Developing Interpersonal Rapport with Students

These seminars were integrated with three demonstration classes and four labs, as illustrated in the 1999 workshop schedule shown in Figure 9. The purpose of integrating seminars, demonstration classes, and labs is to allow participants to integrate ETW components into their practice classes on an ongoing basis, rather than overwhelming participants with too much information at one time. The teaching approach models one used in effective teaching: provide information, demonstrate how to use that information, provide students with opportunities to apply the newly-learned concepts, before providing additional information.

COURSE SCHEDULE						
	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
8:00		Admin Demo Class I	Admin	Admin	Admin	
10:00		Seminars II, III, IV Teaching & Learning	Seminars VIII, IX, X Communication Skills	Demo Class II Lab III Practice Class 2	Lab IV Practice Class 3	Seminar XII Interpersonal Rapport PDW Outbrief ETW Assessment & Wrap-Up
12:00		Lunch	Lunch	Lunch	Lunch	
2:00		Seminars V, VI, VII Organizing a Class	Lab II Practice Class 1	Lab III Practice Class 2	Demo Class III	
4:00	Intro to ETW	Lab I Organizing a Class			Seminar XI Making It Work	
	Reception					
6:00	Seminar I Learning to Teach					
					Hudson River Cruise	

Figure 9. ExCEED Teaching Workshop Schedule, 1999.

Over the course of 20 years, in response to systematic annual feedback, the following modifications to have been made to ETW content:

- The seminar on Teaching with Technology was eliminated to provide additional time for workshop content deemed to be more valuable. To compensate for the elimination of this seminar, demonstrations of effective teaching with technology were integrated into several demonstration classes and seminars.
- Similarly, the seminar on Classroom Assessment Techniques was eliminated, again to save time. To compensate for the elimination of this seminar, specific applications of five particularly useful classroom assessment techniques were integrated into the seminars—and were also used to obtain real-time feedback on the conduct of these seminars from ETW participants.

- New seminars on Systematic Design of Instruction and Nonverbal Communication were added.
- The single seminar on Writing and Speaking was replaced by two seminars, each augmented by substantially enhanced lab exercises.
- The demonstration classes, which originally addressed three distinctly different engineering subjects (statics, dynamics, and structural steel design) were replaced by an integrated package of three consecutive lessons from the same basic engineering mechanics course (trusses 1, trusses 2, and trusses 3). This change allowed for the illustration of a broader range of instructional techniques, while also allowing participants to experience greater depth of learning within a particular subject area. It also demonstrated how the role of an instructor evolves from the presenter of content at the beginning of a lesson block to a facilitator that guides the student's effort as the lesson block progresses. Furthermore, these topics are covered in an elementary statics course, which participants from every civil engineering sub-discipline would have taken.

WORKSHOP SCHEDULE						
	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
7:45		Admin & Gift	Admin & Gift	Admin & Gift	Admin & Gift	Admin & Gift
		Demo Class I	Lab III	Lab IV	Lab V	Seminar XII Design of Instruction
10:00		Seminars III and IV Learning Styles & Learning Objectives	Practice Class 1	Practice Class 2	Practice Class 3	Seminar XIII Making it Work
12:00		Lunch	Lunch	Lunch		Assessment
		Lunch	Lunch	Lab IV	Lunch	ASCE Initiatives
2:00	Intro to ETW Facilities Tour	Seminars V and VI Planning A Class and Writing	Seminars VII, VII, IX Speaking Questioning Classroom Assessment Tech	Practice Class 2 (cont.)		Graduation
4:00	Seminar I Learning To Teach	Lab II Objectives	Demo Class II	Demo Class III	Seminars X and XI Rapport and Non-Verbal Communication	
	Seminar II Principles of Effective Teaching	Cool Ideas Fair				
6:00	Lab I Team-Building				Dinner / Social	
9:00						

Figure 10. ExCEED Teaching Workshop Schedule, 2017.

- A team-building lab was added, and the lab on Organizing a Class was augmented with several new exercises.
- All seminars were periodically refreshed with updated references to relevant scholarly publications, new small-group activities, and enhanced multimedia content.
- The first practice class was moved earlier, and the seminars were distributed more uniformly across the workshop, rather than concentrating most of them in the first two

days. This change added greater variety to the workshop schedule and caused participants to be more active earlier in the workshop.

- The seminar “Making it Work at Your Own Institution” was assigned to assistant mentors to present in 2005 and beyond. These more recent graduates of the ETW program were particularly credible and compelling to the workshop participants on this topic.

The resulting 2017 ETW schedule is shown in Figure 10. What is not captured in these workshop agendas and schedules are the consistently high levels of energy and enthusiasm maintained by the workshop staff throughout the week and the encouragement and positive reinforcement provided to the participants.

ExCEEd Model

The ExCEEd Teaching Workshop strives to demonstrate and then develop good teaching skills. To achieve this goal, “good teaching”, at some point, must be defined and demonstrated. Many others have attempted to answer what constitutes good teaching, and the answer is not unique.

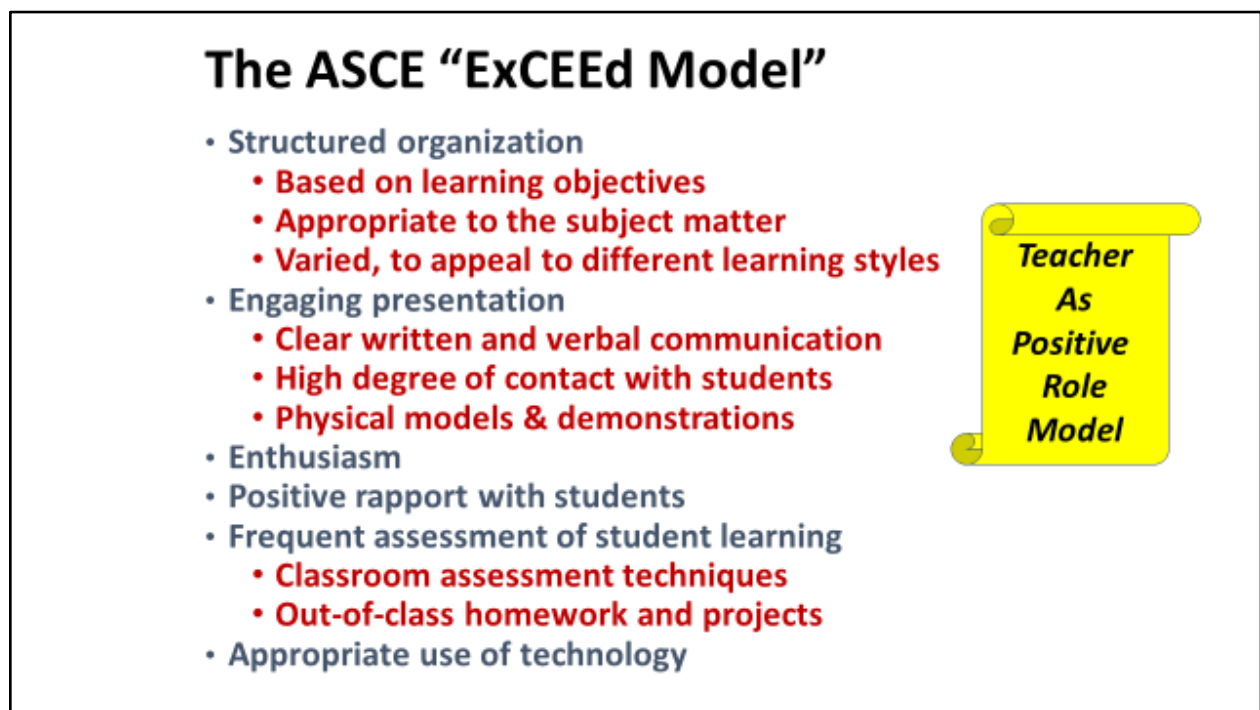


Figure 11: The ExCEEd Teaching Model is used throughout the ETW to define good teaching

The ExCEEd Model, shown in Figure 11, was developed by examining what attributes make a good teacher, how students learn best, and what tools are available to assist the teacher. The model is based on teaching and learning theory from the literature, supported by years of practical experience from veteran instructors. This model is explained and justified in Seminar I - Learning to Teach. Once developed, the model is used in every follow-on seminar, becomes a basis for teaching assessment in the practice classes, and contributes to the overall structure of

the workshop. The ExCEED Teaching Model is deliberately simple, and if an instructor is doing everything in it, then he or she is most likely an effective instructor.

ETW Faculty

Since the inception of the ExCEED Teaching Workshop, over 200 faculty members have served as workshop staff in one or more capacities as Mentor, Assistant Mentor, Senior Mentor, Presenter, Instructor, Program Coordinator, or support staff. Responsibilities of each are as follows:

- **Mentor:** Works with four ETW participants, leads the team's preparation for practice classes, leads assessment of participants' practice classes, presents seminars, and may present demonstration classes. Checks in with, and provides feedback to, the Assistant Mentor on the Assistant Mentor's performance. Frequently communicates with the Assistant Mentor about the participants' experience and how best to help each participant in their efforts.
- **Assistant Mentor:** assists the Mentors in all their duties, provides another set of eyes to ensure a positive experience for participants, digitally records the practice classes, and may present the Workshop's final seminar describing how they have applied the ExCEED Model at their home institution. Assistant Mentors typically will have completed ETW more recently than the Mentors, so they can provide more specific guidance about how they overcame struggles when implementing the teaching techniques.
- **Senior Mentor (a new position established in 2017):** provides feedback to Mentors and Assistant Mentors.
- **Instructors (specific roles no longer used at ETW):** presented seminars, conducted demonstration classes, but were not assigned to mentor specific participant teams.
- **Program Coordinator:** leads and manages the administration, organization, team assignments, logistics, set up, planning, and execution of ETW. Communicates with ASCE staff regarding workshop logistics and may present seminars. The Coordinator is a faculty member at the host institution.
- **Support staff, including ASCE staff and faculty or staff at the host site:** help the Program Coordinators and collect data from each ETW. They may present seminars.

A list of faculty members involved in ETW to date is presented in Appendix C, Table C-1. A list of individuals who have served as Program Coordinator is shown in Appendix C, Table C-2. Seventy-two home institutions are represented by the Assistant Mentors, Mentors, and Program Coordinators, as presented in Appendix C, Table C-3.

Assistant Mentors are typically selected from the pool of faculty who have completed ETW. Prior to 2015, new instructors at the United States Military Academy also served as Assistant Mentors during the workshop and were integral members of teams. These faculty participated in team activities and observed and provided feedback to the participants' practice classes. Since 2015, the role of new instructors at USMA has changed to one of supporting and facilitating team activities.

Among the many unique features of ETW is its focus on pre-workshop staff development. Since 2011, the day prior to the arrival of participants has been devoted to practice, preparation, and calibration of assessment feedback. Pre-workshop preparation includes:

- Introduction and a social activity for workshop staff to develop as a team
- Biographical sketch of participants on each team, presented by the team Mentors, to familiarize workshop staff with each participant and his or her background
- Presentation of one or more seminars, typically by a new presenter, followed by formal assessment of the seminar content and delivery
- Presentation of a Demonstration Class, typically by an Assistant Mentor or new Mentor, followed by assessment of the class organization, content, and delivery. This session serves to develop the instructor's skills. The assessment exercise after the class allows Mentors and Assistant Mentors to calibrate their feedback. Calibration ensures that all staff use consistent terminology and consider the same progression of skills development in the feedback they provide to participants during the workshop.
- Practice and feedback on demonstrations presented by Assistant Mentors.

The pre-workshop preparation supports development of faculty who serve as workshop staff, some of whom may be new to the roles of Assistant Mentor or Mentor. The activities promote camaraderie and trust among the staff, who may seek advice or help from other staff during the workshop. The outcome of this preparation, collaboration, and mutual support is the promotion of a true team spirit among staff, to such an extent that workshop participants have assumed that the staff have been long-time friends and colleagues, when in fact some may have only met one day prior to the participants' arrival.

Participant Feedback

Just as student assessment, peer-assessment, and self-assessment are significant topics within the ETW, assessment of the workshop itself has been a continuous process though the two decades of Project ExCEED. All ETW participants are encouraged to reflect on and evaluate activities conducted as part of the workshop. Participants are asked to score each activity (0-5 with 5 being the highest possible score) relative to two scales: conduct of the activity and value of the activity. By asking for assessments on conduct and value it is possible to identify particular workshop activities that may have been delivered well (conduct), but provide relatively less learning value to the workshop participants. For example, a seminar called "Teaching with Technology" was included in the inaugural ETW program of instruction from 1999 to 2002. The participants' feedback for this seminar included conduct scores that were comparable to the scores achieved by other seminars; however, its lower value scores (which averaged 4.15 on a 5-point scale over the 4 years) ultimately led to the decision to eliminate this seminar in lieu of new content deemed to be more valuable.

Figure 12 provides the average value ratings for the principal workshop activities that have been consistently included in the program of instruction over the past two decades. Other activities such as social events (team-building ice breakers, meals, etc.) are important to the overall success of the workshop, but were not deemed pertinent to the present study. Notably,

participants consider the demonstration classes and practice classes to be the two most valued workshop activities.

These outcomes clearly demonstrate the validity of the ETW instructional design. Workshop participants, most of whom are relatively inexperienced as teachers, see tremendous value in (1) observing high-quality classes taught by role models of educational excellence and (2) practicing the implementation of workshop principles and techniques, then receiving structured peer feedback on their performance--the two principal hallmarks of ETW.

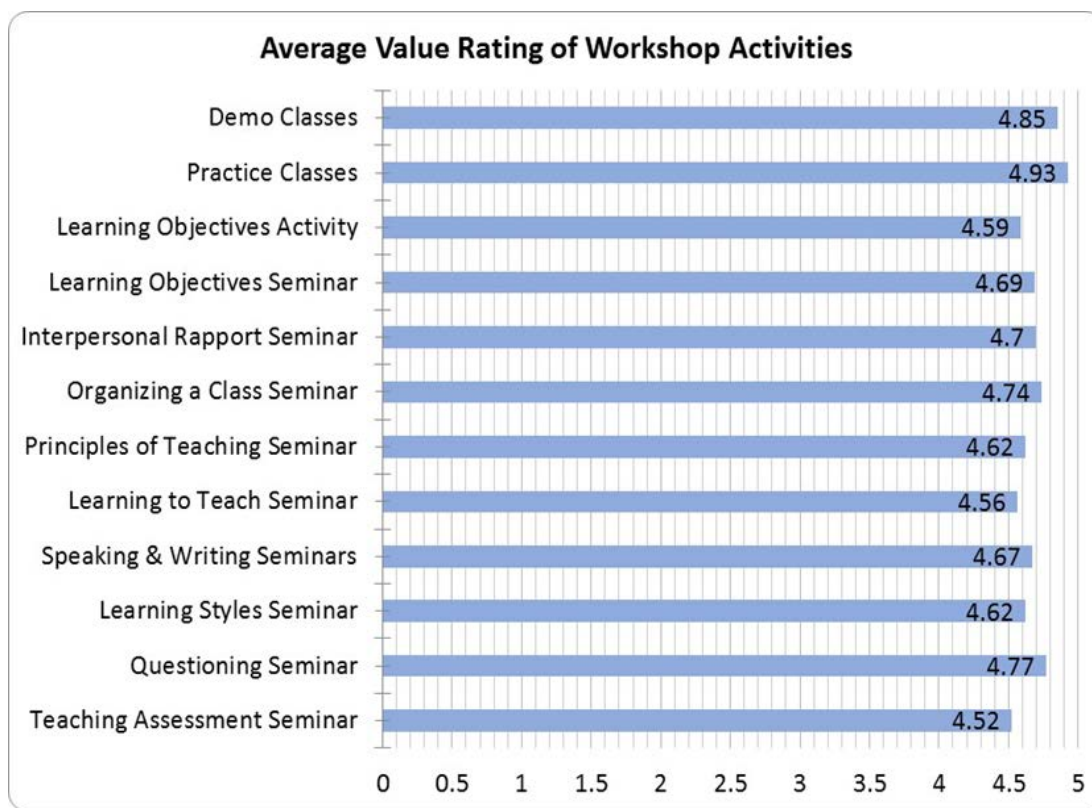


Figure 12: Average Participant Ratings on ETW Activities

Figure 13 indicates that the value of the top three activities (demonstration classes, practices classes, and questioning seminar) has remained fairly consistent over the duration of Project ExCEED. A close inspection of Figure 13 suggests that practice classes are not only valued highly on average, but also that value is remarkably stable over time. Demonstration classes, while always rated highly, do show slightly more variability than the practice classes over the same time period. That higher degree of variability may be attributed to the use of different master teachers to deliver the demonstration classes from one year to the next.

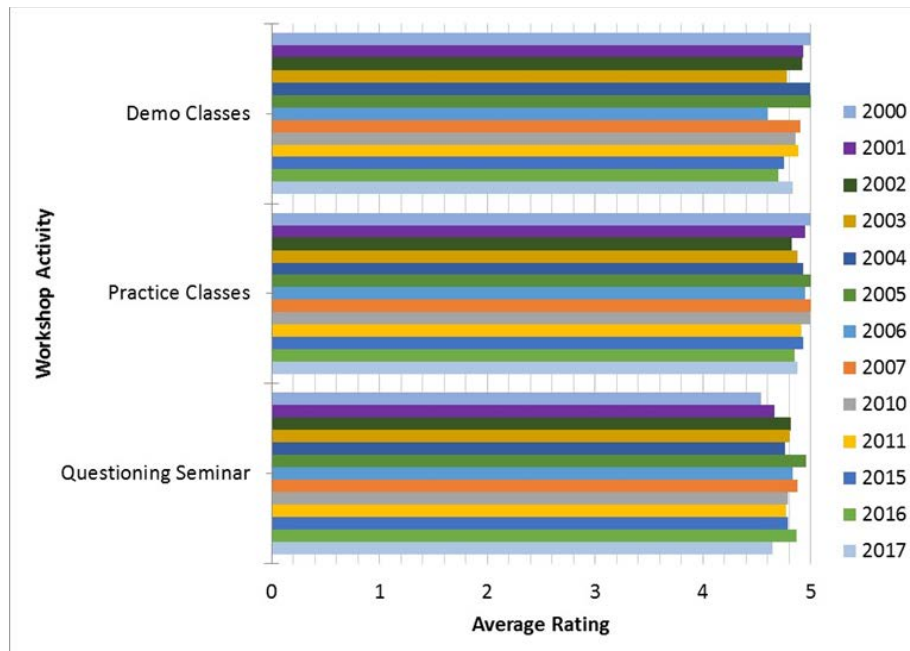


Figure 11. Comparison of Ratings for Demo Classes, Practice Classes, and a key Seminar

Dissemination of the ExCEED Instructional Model and Workshop Content

In addition to its direct impact on the teaching skills of ETW participants, Project ExCEED has influenced civil engineering education more broadly through the systematic dissemination of workshop principles and practices via scholarly publications written by members of the ExCEED community.

Within five years of the launch of Project ExCEED in 1999, a series of quarterly scholarly articles were published in the *ASCE Journal of Professional Issues in Engineering Education and Practice* to document and disseminate the central concepts and techniques of the workshop. The first of these articles highlighted the strengths of the chalkboard as an instructional tool in the classroom and tips for using it effectively¹³. The second article addressed principles and techniques for planning and organizing a class, to include the use of learning objectives and well-structured board notes¹⁴. The next three articles discussed methods for improving engagement while delivering classroom instruction. These methods include:

- Using questioning to engage students and stimulate critical thinking¹⁵
- Introducing drama into class presentations to enhance students' interest and improve their retention of content¹⁶
- Using physical models and demonstrations to enhance students' visualization skills and to bridge the gap between abstract theory and physical behavior¹⁷

Transitioning from an initial focus on classroom instruction, the final three articles in the series focused more broadly on instructional design and the selection and sequencing of learning activities. These topics included:

- The Model Instructional Strategy, described above (Figure 5)⁸
- The ExCEED Teaching Model, described above (Figure 6)¹⁸

- Teaching assessment in a variety of forms, from student assessment to peer and self-assessment, supported by teaching assessment worksheet derived directly from the ExCEED Teaching Model (Appendix A)¹⁹

Through the successful administration of the ExCEED Teaching Workshop during its first ten years, participants and workshop staff assessed the workshop components immediately following each offering. In addition, a follow-up survey was administered to ETW participants a semester after attending the workshop to compare pre-ETW and post-ETW performance. The self-reported results indicate a notable improvement in virtually all categories related to ETW participant teaching. A longitudinal study was also performed by surveying all past ETW participants about the long term impact of the workshop with the results indicating that many of the respondents use several of the ExCEED Teaching Model strategies and techniques on a daily basis. The results of these surveys and the immediate workshop assessment were analyzed and summarized^{20,21}. Prior to this, other articles shared assessments of ETW's impact over shorter periods of time^{22,23}.

While the majority of the previously cited articles have been authored by the founding members of the ExCEED Teaching Workshop or those closely related to the first ten years of its existence, ETW participants and newer staff have also contributed to the literature over time. Several individuals or teams have written about the impact that the ETW had on them^{24,25,26}. The impact of the ETW has also been documented in the extension of some of its principles to other applications and workshops^{27,28,29}.

A wide range of ongoing research in engineering education is based on the work presented in the foundational articles summarized above. A search of the ASEE PEER lists 2140 citations on the word ExCEED, 276 citations on ASCE ExCEED and 83 citations on ExCEED Teaching Workshop.³⁰

ExCEED II

The widespread promotion of basic-level teaching proficiency through ETW also stimulated demand for formalized instruction in advanced-level teaching principles and techniques.

CFD conducted a longitudinal survey of all ETW participants in 2007 and found that 73% of the respondents indicated an interest in attending an advanced post-ETW workshop. These respondents were also asked what topics should be included. Using that information, CFD planned the first ExCEED II workshop which was hosted at Northern Arizona University (NAU) in 2009.

The ASCE budget did not allow for financial support, so the ExCEED II workshop needed to be self-sustaining. Without such support, participants had to cover travel and registration costs for the workshop, which seems to have adversely affected demand for ExCEED II. To mitigate this problem, the first workshop was planned to last a day and a half and was scheduled immediately after the 2009 ETW at NAU. The mentors were already on site, thus eliminating their travel costs. Because some of the NAU assistant mentors were ExCEED II participants, they also incurred no additional travel costs. Several other past-ETW graduates attended despite the

additional expense. The NAU ETW ended at noon on a Friday and the ExCEED II workshop started immediately thereafter and lasted through the following day. Sixteen participants were subdivided into four teams, and each team was assigned a Mentor.

The first ExCEED II workshop consisted of a 25 minute demonstration class, two 25 minute participant classes, a case study exercise and seven seminars. The seminar topics consisted of: ETW Review, Novice to Expert, Distance Education, Project Based Learning, Managing Teams, Large Classroom Techniques, and Dealing with Difficult Students. The most highly rated activity from the participants was the practice classes. The participants clearly continued to value the opportunity for detailed feedback on their teaching.

Afterwards, CFD concluded that ExCEED II workshops should be offered every three years. The second ExCEED II was offered in a similar format at Florida Gulf Coast University (FGCU) immediately following the ETW in 2012. Again, there were 16 participants and the topics were identical, except the case study exercise and the Novice to Expert seminar were removed to allow more time for discussion and reduce the rushed feeling of the previous ExCEED II workshop. This FGCU version started later on Friday afternoon and extended into a half day on Sunday. These changes resulted from feedback from the initial ExCEED II³¹

The ExCEED II workshop was well received by those who attended. For those assistant mentors who had just served in the preceding ETW, the workshop was cost-effective to attend. It was more difficult and more expensive for other potential applicants, which accounts for only 16 participants in a workshop designed for 24. The topics offered in ExCEED II tend to be more specialized and state-of-the-art. Under the current model, the ExCEED II workshop must use mentors and presenters who have just served in the preceding ETW. These individuals may not have the requisite expertise to develop and present highly specialized ExCEED II seminars.

CFD attempted a third ExCEED II in 2015, but the demand was insufficient. CFD will consider offering another ExCEED II when demand is apparent or when funding can be found to try a new model that overcomes the current challenges.

Mini-ExCEED Workshops

Recognizing that significant demand for the ExCEED teaching workshops was going unfulfilled, ASCE offered universities the opportunity to host a two-day Mini-ExCEED workshop at their own facilities. A typical Mini-ExCEED workshop consists of two demonstration classes and most of the same seminars taught in the week-long ETW. The cost is greatly reduced because only two experienced presenters and one ASCE staff member are required to offer the workshop. The host university handles most of the logistics and identifies the participants. The university currently pays a fixed fee of \$12,000 to ASCE to cover registration costs.

The greatest disadvantage of the mini-ExCEED format is the absence of the labs, participant practice classes, and personalized feedback, as offered in the weeklong ETW. The practice classes require the greatest amount of faculty support in the ETW, but they are also the most valuable element of the workshop, as shown in the feedback presented earlier. The practice

classes set the ExCEED Teaching Workshops apart from any other teaching workshops currently available.



Figure 12: Participants from the mini-ExCEED workshop at Cal Poly Pomona in 2012

There are significant advantages in the Mini-ExCEED format besides the reduced cost. Without the practice classes, there is no need for small four-person teams; thus, more participants can be accommodated, and fewer classrooms are needed. The Mini-ExCEED also provides opportunities for adjunct faculty and faculty members from other disciplines to attend. These individuals would typically be ineligible to participate in the week-long ETW. One pitfall of the mini-ExCEED is the difficulty of getting participants to engage fully when their offices and attending duties are nearby. While paying a single fee regardless of the number of participants can be an advantage for the university, individual faculty members can feel less obligated to engage fully as a result.

The schools that have hosted mini-ExCEED workshops include:

- University of Missouri-Rolla (now Missouri University of Science and Technology) (October 7-8, 2004)
- University of Delaware (December 6-7, 2007)
- Portland State (June 23, 2009) – part of the Transportation Engineering Education Conference
- University of Texas at Tyler (Jan 5-6, 2010) – used to create ASCE DVDs
- Virginia Polytechnic Institute and State University, (August 12-13, 2010)
- Wentworth Institute of Technology (January 12-13, 2011)
- University of Houston (January 10-11, 2012)
- Cal Poly Pomona (August 6-7, 2012)
- Iowa State University (January 7-8, 2013)
- Arizona State University (January 7-8, 2014)
- University of Wisconsin Platteville (scheduled for May 2018)

In addition to these mini-ExCEEDs, ASCE has offered even shorter elements of the ExCEED Teaching Workshop to targeted audiences to help advertise the value of this experience for civil engineering faculty. For example, a half-day workshop was offered as part of the inaugural Civil Engineering Department Heads Conference in May 2005 in Salt Lake City and again in May 2010 at the same conference in Pittsburgh.

ExCEED Awards

Project ExCEED has also achieved broader influence on civil engineering education through an awards program honoring and recognizing exemplary educators. The annual ExCEED Teaching Award recognizes outstanding new faculty with five or fewer years of teaching experience. The award submission packet documents scholarly work published in educational venues, sample teaching materials, evidence of outreach and advisement to students, sample syllabi demonstrating evidence of curriculum development, and any other relevant items demonstrating excellence in teaching and a commitment to undergraduate engineering education.³² CFD selects the awardees annually, and multiple awards may be given. The award is presented at the CE Division banquet at the annual ASCE conference. The past awardees are listed in Table 3 and not surprisingly, many are graduates of ETW.

The ExCEED Leadership Award recognizes ASCE members who have demonstrated extraordinary leadership in support of civil engineering education. The selection process is formalized,³³ and up to three awards per year may be presented. The award(s) were initially presented at the annual ASCE conference, but have more recently been included as part of the CE Division banquet at the annual ASCE conference. Past recipients are listed in Table 4.

2017	James Kaklamanos, Merrimack College; Edward Segal, Hofstra University
2016	Mary Katherine Watson, The Citadel
2015	Scott Katalenich, United States Military Academy; Michelle Beiler, Bucknell University
2014	David Hurwitz, Oregon State; Amy Javernick-Will, University of Colorado, Boulder; Malay Ghose-Hajra, University of New Orleans; Ann Jeffers, University of Michigan; Kristoph Kinzli, Florida Gulf Coast University; Richard Porter, University of Utah
2013	Elma Hernandez, Texas Tech University; John Lawson, California Polytechnic State University, San Luis Obispo; Shawn McElmurry, Wayne State University
2012	Brock Barry, United States Military Academy; Chris Meehan, University of Delaware; Charles Riley, Oregon Institute of Technology; Kelly Salyards, Bucknell University; Heather Shipley, University of Texas at San Antonio
2011	Lisa Colosi, University of Virginia; Ryan Fries, Southern Illinois University Edwardsville; Matthew Hallowell, University of Colorado, Boulder; Jin-Lee Kim, California State University Long Beach; Michael McGinnis, University of Texas at Tyler
2010	Eric Crispino, United States Military Academy; Tanya Kunberger, Florida Gulf Coast University
2009	Aaron Hill, United States Military Academy
2008	Shane A. Brown, Washington State University; Dr. Ali Porbaha, California State University, Sacramento
2007	Decker B. Hains, United States Military Academy; Jack A. Puleo, University of Delaware; Kevin C. Bower, The Citadel; Charles D. Newhouse, Texas Tech University
2006	Ahmet Aydilek, University of Maryland; Giovanna Biscontin, Texas A&M University; Audra Morse, Texas Tech University; Roseanna Neupauer, University of Colorado, Boulder
2005	Scott Hamilton, United States Military Academy; Stephen Kurtz, Lafayette College; Daniel Oerther, University of Cincinnati; Matthew Roberts, University of Wisconsin - Platteville
2004	Craig Quadrato, United States Military Academy; Timothy W. Mays, The Citadel; Anthony Jones, United States Air Force Academy; Camilla Saviz, University of the Pacific
2003	Andrew Rose, University of Pittsburgh at Johnstown; Amy B. Chan-Hilton, Florida State University; Luciana Barrosa, Texas A&M University; Thomas Piechota, Univ. of Nevada-Las Vegas
2002	Joseph Hanus, U.S. Military Academy; Mark Valenzuela, Univ. of Evansville; John Nicklow, Southern Illinois Univ at Carbondale; Crist Khachikian, California State Univ at Los Angeles

Table 3: Recipients of the ExCEED Teaching Award

Year	Recipient	Location of Award Presentation
2017	Bob O'Neill	ASEE, Columbus, OH
2016	Kristina Swallow	ASCE Committee on Education Committees Weekend, Denver, CO
2015	Ron Welch & Deb Larson	ASEE, Seattle, WA
2014	Bill Highter	ASEE, Indianapolis, IN
2013	Wayne Bergstrom	ASEE, Atlanta, GA
2012	George Blandford	ASEE, San Antonio, TX
2011	Larry Feeser	ASEE, Vancouver, BC, Canada
2010	Ken Fridley	ASEE, Louisville, KY
2009	Bill Knocke	ASEE, Austin, TX
2008	Phil Borrowman	ASEE, Pittsburgh, PA
2007	Jeff Russell	ASEE, Honolulu, HI
2006	Al Estes, Norm Dennis, & Jim O'Brien	ASEE, Chicago, IL
2005	Tom Lenox	ASEE, Portland, OR
2004	Steve Ressler	Baltimore, MD
2003	Stu Welsh	Nashville, TN
2002	Lesley Rosier & Kelly Payne	Washington, DC
2001	Rick Scranton	Seattle, WA
2000	Rich Anderson & Jerry Rogers	Charlotte, NC

Table 4. Past recipients of the ExCEED Leadership Award

Conclusions: The Impact and Future of Project ExCEED

Systematic assessment of ETW learning outcomes clearly demonstrates that the workshop's unique instructional model is sound. The 38 ETWs to date have had a substantial positive impact on civil engineering education by fostering measurable improvements to ETW participants' teaching skills and, thus, greatly enhancing student learning. If one assumes that a given civil engineering educator teaches 100 students per year over a teaching career of 20 years, then the 910 graduates of the ETW have positively affected over 1.8 million engineering students. This impact is further demonstrated by significantly increased demand for workshop participation and the continuing support of engineering deans and civil engineering department heads. A future paper will quantify these impacts in greater detail.

Beyond these immediate impacts, Project ExCEED has also exerted a broader positive influence on civil engineering education through scholarly dissemination of workshop principles and practices, through the formal recognition of educational excellence, and through the formation of an ever-growing community of practice, consisting of ETW graduates and faculty who have maintained strong professional ties beyond their participation in the workshop. Members of this community continue to interact, share ideas, and support each other's long-term commitment to excellence in civil engineering education.

Based on these past successes, it is clear that Project ExCEED has great potential to continue positively influencing civil engineering education in the future. Nonetheless, the project faces some significant challenges. As the effectiveness of the initiative has been demonstrated, the demand has increased, but the funding and staffing have not. Options for meeting this growing demand include increasing the number of participants in a given workshop, holding more workshops in a given year, or changing the nature of the workshop through offerings such as the mini-ExCEEDs. The greatest challenge in all of these measures is increasing capacity without degrading the quality of the workshop--and, in particular, without compromising on the benefits that result from small teams, individualized feedback, and active participation.

The staffing of the workshops also needs to increase to accommodate this increased demand. The current workshop format requires significant effort on the part of ASCE staff and the host institution. Each workshop also requires a cadre of mentors and assistant mentors with sufficient knowledge and credibility to provide high-quality feedback, present seminars, and conduct demonstration classes. These human resources are grown from within, and each new ETW graduate is a potential candidate for filling these roles over the long term. Only a handful of universities have hosted an ETW, so there is great potential for growth in institutional capacity. With continued growth, the size of CFD and ASCE staff would potentially need to increase as well.

ASCE currently funds a significant portion of these workshops, and this level of Society funding is unlikely to increase in the future. Thus, expansion of Project ExCEED Funding will require funding from other sources, such as donors who see the value of this initiative, the universities that obtain direct benefits from the training, or the participants who could potentially pay a larger fee to attend. All funding mechanisms are currently being explored.

Another option for expanding Project ExCEED is to involve the other engineering disciplines, which have similar needs. It has been fourteen years since a serious attempt has been made to do this. With Project ExCEED's additional track record of success over that time period, a new multidisciplinary version of ETW might well gain broader support.

Another major challenge for the future is staying current with the needs of the teaching profession and the changing body of knowledge in engineering education. National trends in university teaching include the growth in the number of larger class sizes, increased use of technology in the classroom, more distance learning opportunities, and increased emphasis on active learning, project-based learning, and the "flipped classroom." To remain relevant, the ETW program of instruction should address these changes at an appropriate level. While the core tenets of the ExCEED instructional model remain undeniably valid, the educational literature does provide updates and new findings that should be recognized and incorporated. For example, recent literature has proposed changes to Bloom's Taxonomy, challenged the value of learning styles, and investigated new ways in which students learn. The most rapidly changing aspect of education is teaching technology--an area in which computer simulations, YouTube videos, online textbooks, smart boards and writing pads, virtual laboratories, and classroom management systems are constantly evolving. To remain relevant, the CFD must understand the changes and purposefully incorporate the most relevant developments into the ETW. The ExCEED II workshops provide a particularly appropriate mechanism for doing this.

The future challenges facing Project ExCEED are substantial; yet these challenges can be overcome through continued application of the approaches that have produced such great success during the project's first two decades--a scholarly approach to instructional design, intensive management of the program and its resources, careful attention to the long-term development of workshop staff, rigorous demonstration of positive outcomes, and long-term involvement by a cadre of dedicated professionals who support the project with their time and talent. Through these means, Project ExCEED will contribute even more over the next 20 years.



Figure 13: The ExCEED group photo at the 2012 ETW at Florida Gulf Coast University. A group photo is taken at every workshop.

References

- ¹ASCE, "Summary Report: 1995 Civil Engineering Education Conference," Denver, CO, June 8-11, 1995.
- ²ASCE, "Charge Statement – Committee on Faculty Development," November 1998.
- ³ASCE, Meeting Minutes – Committee on Faculty Development, November 1998.
- ⁴ASEE, "National Effective Teaching Institutes," <https://www.asee.org/conferences-and-events/conferences/neti>, accessed Dec 12, 2017.
- ⁵Conley, C.H., Ressler, S.J., Lenox, T.A. and Samples, J. A. 2000. Teaching Teachers to Teach Engineering – T⁴E, *Journal of Engineering Education*, 89, pp. 31-38.
- ⁶Larson, D., N. Dennis, M Evans, R. O'Neill, A. Brizendine, M Hoit, K Murray, J. Issacs, S. Holzer, Program Design Workshop Final Report, , 29 pages, submitted to Director of Educational Activities, American Society of Civil Engineers, Aug 13, 1999.
- ⁷Apple, Daniel K., Marie Baehr, Grady Batchelor, Steven Beyerlein, Sarah Carroll, Robbi Demetrio, Karl Krumsieg, and Eric Wignall, ed. (1995). *Foundations of Learning*, Pacific Crest Software, Corvallis, OR.
- ⁸Welch, R. W., S. J. Ressler, and A. C. Estes (2005). "A Model for Instructional Design." *Journal of Professional Issues in Engineering Education and Practice*, 131 (3), 167-171.
- ⁹Seymour, E. and Hewitt, N, (1997) *Talking About Leaving: Why Undergraduates Leave the Sciences*, Westview Press, Colorado.

- ¹⁰Lowman, Joseph. (1995) *Mastering the Techniques of Teaching*. San Francisco: Jossey-Bass
- ¹¹Wankat, P. C. and Oreovicz, F. S., (1993) *Teaching Engineering*, McGraw-Hill, New York.
- ¹²Angelo, Thomas A. and K. Patricia Cross (1993). *Classroom Assessment Techniques: A Handbook for College Teachers*, Jossey-Bass, San Francisco.
- ¹³Ressler, S. J. (2004). "Teaching lessons learned: Whither the Chalkboard? Case for a Low-Tech Tool in a High-Tech World" *J. Prof. Issues Eng. Educ. Pract.*, 2004, 130(2): 71-73.
- ¹⁴Ressler, S. J., Welch, R. W., and Meyer, K. F. (2004). "Teaching Lessons Learned: Organizing and Delivering Classroom Instruction." *J. Prof. Issues Eng. Educ. Pract.*, 130(3), 153–156.
- ¹⁵Estes, A. C., Welch, R. W., and Ressler, S. J. (2004). "Teaching Lessons Learned: Questioning: Bringing your students along on the journey." *J. Surv. Eng.*, 130(4), pp. 237–242.
- ¹⁶Estes, A. C. _2005_. "Teaching lessons learned: Shock and awe in the civil engineering classroom." *J. Prof. Issues Eng. Educ. Pract.*, 131(1), 1–5.
- ¹⁷Vander Schaaf, R., and Klosky, J. L. _2005_. "Teaching lessons learned: Classroom demonstrations in introductory mechanics." *J. Prof. Issues Eng. Educ. Pract.*, 131_2_, 83–89.
- ¹⁸Estes, A. C., Welch, R. W., and Ressler, S. J. (2005). "Teaching lessons learned: The ExCEED teaching model." *J. Surv. Eng.*, 131(4), 218–222.
- ¹⁹Estes, A. C., Welch, R. W., and Ressler, S. J. (2006). "Teaching lessons learned: The Assessment of Teaching." *Journal of Professional Issues in Engineering Education and Practice*, 132(1): 2-10.
- ²⁰Estes, A.C., Welch, R.W., Ressler, S.J., Dennis, N., Larson, D., Considine, C., Nilsson, T., O'Brien, J., and Lenox, T. 2008. ExCEED Teaching Workshop: Tenth Anniversary. ASEE Annual Conference Proceedings, Paper 2008-1639. Pittsburgh. June 22-25.
- ²¹Estes, A.C., Welch, R.W., Ressler, S.J., Dennis, N., Larson, D., Considine, C., Nilsson, T., O'Neill, R.J., O'Brien, J. and Lenox, T. 2010. Ten Years of ExCEED: Making a Difference in the Profession. *The International Journal of Engineering Education*. 25:1, 141-154.
- ²²Estes, A.C, Welch, R.W., and Ressler, S.J., 2002. ExCEED teaching workshop: A landmark faculty development program. ASEE Zone 1 Conference Proceeding. April.
- ²³Estes, A.C. and Welch, R.W. 2005. Board notes and questioning two time-tested techniques for effective teaching. 2005 ASEE Annual Conference and Exposition Proceedings, ASEE, Portland, Oregon, June 12-15
- ²⁴Welch, R., Baldwin, J., Bentler, D., Clarke, D., Gross, S., and Hitt, J. 2001. The ExCEED teaching workshop: Participant's perspective and assessment, ASEE Annual Conference Proceedings, pp. 10057- 10070.
- ²⁵Devine, D. 2005. "ExCEED impact on a new professor," ASEE Annual Conference Proceedings, p 6063-6076.
- ²⁶Boyajian, D.M., Chen, S. and Weggel, D.C. 2007. "Perspectives on Instructional Methods from the ExCEED Teaching Workshop. *World Transactions on Engineering and Technology Education*," 6(1), pp. 47-51.
- ²⁷Morse, A. 2009. "Application of the ExCEED Teaching Model to Improve Graduate Teaching in Environmental Engineering Courses," ASEE Annual Conference, Austin, TX, June.
- ²⁸Farnsworth, C.B., Ziegenfuss, D.H., and Roberts, M.W. 2017. "A Model Workshop for Helping New Faculty Engage Students in the STEM Classroom," ASEE Annual Conference, Columbus, OH. June.
- ²⁹Nicklow, J.W., Marikunte, S.S. and Chevalier, L.R. 2007. "Balancing Pedagogical and Professional Practice Skills in the Training of Graduate Teaching Assistants." *Journal of Professional Issues in Engineering Education and Practice*, 133(2), pp. 89-93.
- ³⁰ASEE. Papers on Engineering Education Repository (PEER) database. American Society for Engineering Education, Washington D.C. <https://peer.asee.org/> accessed 3 Feb 2018
- ³¹Larson, D., Estes, A., Dennis, N., and Welch, R. and Considine, C. "ExCEED II: Advanced Training for Even Better Teaching." ASEE Annual Conference Proceedings, Paper AC 2010-134,
- ³²ASCE. ExCEED Leadership Award Criteria and Process. American Society of Civil Engineers.
- ³³ASCE. ExCEED Teaching Award. American Society of Civil Engineers. <http://www.asce.org/templates/award-detail.aspx?id=5773> accessed 2 Jan 2018.

Appendix A

TEACHING ASSESSMENT WORKSHEET

INSTRUCTOR: _____

ASSESSED BY: _____

LESSON TOPIC: _____

DATE: _____

STRENGTHS:

1	
2	
3	
4	
5	
6	
7	
8	
9	

AREAS FOR IMPROVEMENT:

10	
11	
12	
13	
14	
15	
16	
17	
18	

Figure A-1: ExCEED Teaching Worksheet (Front Side)

Appendix A

19	
20	
21	
22	
23	
24	
25	

	Needs Work	Good	Excellent	Remarks
TECHNICAL EXPERTISE				
Command of the Subject Matter				
LESSON ORGANIZATION				
Lesson Objectives				
Organization of Boards & Classroom Activities				
CONDUCT OF THE CLASS				
Enthusiasm, Energy, and Confidence				
Orientation to the Subject Matter				
Clarity of Presentation (<i>boards, viewgraphs, etc.</i>)				
Clarity & Precision of Explanations				
Voice (<i>volume, speed, variation</i>)				
Questioning & Answering Questions				
Contact with Students				
Visual Aids and Demonstrations				
Time Management				
Appropriate Use of Textbook				
THE CLASSROOM ENVIRONMENT				
Classroom Appearance				
OVERALL ASSESSMENT: <i>Are the students who attended this class adequately prepared to accomplish the Lesson Objectives?</i> Yes <input type="checkbox"/> No <input type="checkbox"/> Not sure <input type="checkbox"/>				

Specific areas on which to focus during your next class:

1. _____
2. _____
3. _____

Figure A-1: ExCEED Teaching Worksheet (Back Side)

Appendix B

Institution			Total	1999 - 2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Alfred State College	Private not-for-profit	Master's Colleges & Universities: Medium Programs	2	1			1						
Angelo State University	Public	Master's Colleges & Universities: Larger Programs	1										1
Arizona State University	Public	Doctoral Universities: Highest Research Activity	5	4					1				
Arkansas Tech University	Public	Master's Colleges & Universities: Larger Programs	1	1									
Auburn University	Public	Doctoral Universities: Higher Research Activity	4	2									2
Boise State University	Public	Doctoral Universities: Moderate Research Activity	4	2		1						1	
Bradley University	Private not-for-profit	Master's Colleges & Universities: Medium Programs	3	3									
Bingham Young University	Private not-for-profit	Doctoral Universities: Higher Research Activity	1								1		
Bucknell University	Private not-for-profit	Baccalaureate Colleges: Arts & Sciences Focus	9	3	2	2	1			1			
California Baptist University	Private not-for-profit	Master's Colleges & Universities: Larger Programs	2				1	1					
California Polytechnic State University, San Luis Obispo	Public	Master's Colleges & Universities: Larger Programs	18	8	4	1	2		1	1			1
California State University, Los Angeles	Public	Master's Colleges & Universities: Larger Programs	5	1			1	2					1
California State University, Chico	Public	Master's Colleges & Universities: Larger Programs	3	2									1
California State University, East Bay	Public	Master's Colleges & Universities: Larger Programs	1									1	
California State University, Fresno	Public	Doctoral Universities: Moderate Research Activity	1							1			
California State Polytechnic University, Pomona	Public	Master's Colleges & Universities: Larger Programs	3		1						1	1	
California State University, Long Beach	Public	Master's Colleges & Universities: Larger Programs	3	1	1	1							
California State University, Sacramento	Public	Master's Colleges & Universities: Larger Programs	9	4	2	1					1		1
Calvin College	Private not-for-profit	Baccalaureate Colleges: Diverse Fields	1			1							
Carnegie Mellon University	Private not-for-profit	Doctoral Universities: Highest Research Activity	2									2	
Carroll College	Private not-for-profit	Baccalaureate Colleges: Diverse Fields	1	1									
Catholic University	Private not-for-profit	Doctoral Universities: Highest Research Activity	4	2			2						
Central Connecticut State University	Public	Master's Colleges & Universities: Larger Programs	1			1							
Central Maine Technical College	Public	Associate's Colleges: Mixed Transfer/Career & Techni	1	1									
Central Washington University	Public	Master's Colleges & Universities: Larger Programs	1	1									
Cincinnati State Technical & Community College	Public	Associate's Colleges: Mixed Transfer/Career & Techni	1	1									
City College of New York	Public	Master's Colleges & Universities: Larger Programs	5	2		1	1	1					
City University of New York, New York City College of Tr	Public	Baccalaureate Colleges: Diverse Fields	1		1								
Clark Atlanta University	Public	Doctoral Universities: Higher Research Activity	1	1									
Clarison University	Private not-for-profit	Doctoral Universities: Moderate Research Activity	9	6		1		1					1
Clemson University	Public	Doctoral Universities: Highest Research Activity	13	9					1	1	2	1	
Cleveland State University	Public	Doctoral Universities: Higher Research Activity	2					1		1			
Colorado School of Mines	Public	Doctoral Universities: Higher Research Activity	3	1							1	1	
Colorado State University	Public	Doctoral Universities: Highest Research Activity	12	3	1	1	1	1	1	2		1	1
Columbia University	Private not-for-profit	Doctoral Universities: Highest Research Activity	1	1									
Cornell University	Private not-for-profit	Doctoral Universities: Highest Research Activity	5	5									
Drexel University	Private not-for-profit	Doctoral Universities: Highest Research Activity	2	2									
Durham Institute of Technology	International	Doctoral Universities	1	1									
Eastern Illinois University	Public	Master's Colleges & Universities: Larger Programs	1	1									
Fairleigh Dickinson University	Private not-for-profit	Master's Colleges & Universities: Larger Programs	1									1	
Fairmont State College	Public	Master's Colleges & Universities: Small Programs	3	3									
Ferris State University	Public	Master's Colleges & Universities: Medium Programs	1	1									
Florida Gulf Coast University	Public	Master's Colleges & Universities: Larger Programs	14	4	1		1	1	1	1	1	2	2
Florida State University	Public	Doctoral Universities: Highest Research Activity	1	1									
Florida Tech	Private for-profit	Baccalaureate/Associate's Colleges: Associate's Domi	2	1							1		
George Mason University	Public	Doctoral Universities: Highest Research Activity	3	2								1	
George Washington University	Private not-for-profit	Doctoral Universities: Highest Research Activity	1			1							
Georgia Institute of Technology	Public	Doctoral Universities: Highest Research Activity	4	3			1						
Georgia Southern University	Public	Doctoral Universities: Moderate Research Activity	1	1									
Gonzaga University	Private not-for-profit	Master's Colleges & Universities: Larger Programs	1						1				
Hong Kong Polytechnic University	International		2	2									
Illinois Institute of Technology	Private not-for-profit	Doctoral Universities: Highest Research Activity	3	2		1							
Indiana University Purdue University Fort Wayne	Public	Master's Colleges & Universities: Larger Programs	3	1									2
Iowa State University of Science & Technology	Public	Doctoral Universities: Highest Research Activity	11	7		1	1				1	1	
Jackson State University	Public	Doctoral Universities: Higher Research Activity	1	1									
John Brown University	Private not-for-profit	Master's Colleges & Universities: Medium Programs	1	1									
Kabul University	International		3	3									
Kansas State University	Public	Doctoral Universities: Highest Research Activity	8	3		1			1	2		1	
Lafayette College	Private not-for-profit	Baccalaureate Colleges: Arts & Sciences Focus	3	3									
Lamar University	Public	Doctoral Universities: Moderate Research Activity	3	1				1					1
Lawrence Technological University	Public	Master's Colleges & Universities: Larger Programs	5	3	1		1						
Lehigh University	Public	Doctoral Universities: Higher Research Activity	3	2						1			
Louisiana State University	Public	Doctoral Universities: Highest Research Activity	5	4								1	
Louisiana Tech University	Public	Doctoral Universities: Moderate Research Activity	2	2									
Loyola Marymount University	Private not-for-profit	Master's Colleges & Universities: Larger Programs	1	1									
Manhattan College	Private not-for-profit	Master's Colleges & Universities: Medium Programs	6	2				1			1		2
Marquette University	Public	Doctoral Universities: Higher Research Activity	1	1									
Memorial University of Newfoundland (Canada)	International		1					1					
Merrimack College	Private not-for-profit	Master's Colleges & Universities: Medium Programs	5	1	1				1		1		1
Michigan State University	Public	Doctoral Universities: Highest Research Activity	3	3									
Michigan Technological University	Public	Doctoral Universities: Higher Research Activity	7	5	1							1	
Middlesex County College	Public	Associate's Colleges: High Transfer-Mixed Traditional	1	1									
Millwaukee School of Engineering	Private not-for-profit	Master's Colleges & Universities: Small Programs	5	1						1	1	1	1
Minnesota State University, Mankato	Public	Master's Colleges & Universities: Larger Programs	5	3		1					1		
Mississippi State University	Public	Doctoral Universities: Higher Research Activity	4	2					1				
Missouri University of Science and Technology	Public	Doctoral Universities: Higher Research Activity	9	5	1			1				1	1
Montana State University	Public	Doctoral Universities: Higher Research Activity	2	2									
Nassau Community College	Public	Associate's Colleges: High Transfer-High Traditional	1	1									
New Jersey Institute of Technology	Public	Doctoral Universities: Higher Research Activity	2	2									
New Mexico State University	Public	Doctoral Universities: Higher Research Activity	2	2									
New York City College of Technology	Public	Baccalaureate Colleges: Diverse Fields	3	2			1						
New York University, Polytechnic School of	Private not-for-profit	Doctoral Universities: Highest Research Activity	1							1			
Nicholls State University	Public	Master's Colleges & Universities: Medium Programs	1		1								
North Carolina A&T State University	Public	Doctoral Universities: Higher Research Activity	1	1									
North Carolina State University	Public	Doctoral Universities: Highest Research Activity	2										2
North Idaho College	Public	Associate's Colleges: Mixed Transfer/Career & Techni	1	1									
Northeastern University	Private not-for-profit	Doctoral Universities: Highest Research Activity	2	2									
Northern Arizona University	Public	Doctoral Universities: Higher Research Activity	9	4	1			1				3	
Norwich University	Private not-for-profit	Master's Colleges & Universities: Larger Programs	4	1					1	1		1	
Ohio Northern University	Private not-for-profit	Baccalaureate Colleges: Diverse Fields	2	1		1							
Ohio State University	Public	Doctoral Universities: Highest Research Activity	1	1									
Ohio University	Public	Doctoral Universities: Higher Research Activity	5	3		1					1		
Oklahoma State University	Public	Doctoral Universities: Higher Research Activity	6	2	1					2			1
Old Dominion University	Public	Doctoral Universities: Higher Research Activity	6	3					1		1	1	
Oregon Institute of Technology	Public	Baccalaureate Colleges: Diverse Fields	3	1			2						
Oregon State University	Public	Doctoral Universities: Highest Research Activity	8	1		2		1			1	2	1

Table B-1: Universities That Have Participated in ExCEED Teaching Workshops

Appendix B

[illegible]

Table B-1: Participating ExCEED Teaching Workshop Universities (Continued)

Appendix B

University of Nebraska, Lincoln	Public	Doctoral Universities: Highest Research Activity	11	5	1		1			1	2		1
University of Nebraska, Omaha	Public	Doctoral Universities: Moderate Research Activity	1	1									
University of Nevada, Las Vegas	Public	Doctoral Universities: Higher Research Activity	6	4						1			1
University of Nevada, Reno	Public	Doctoral Universities: Higher Research Activity	3	1							1		1
University of New Hampshire	Public	Doctoral Universities: Higher Research Activity	6	4				1			1		
University of New Haven	Private not-for-profit	Master's Colleges & Universities: Larger Programs	2	2									
University of New Mexico	Public	Doctoral Universities: Highest Research Activity	6	4							1		1
University of North Carolina, Charlotte	Public	Doctoral Universities: Higher Research Activity	8	4		1				1	1		1
University of North Florida	Public	Master's Colleges & Universities: Larger Programs	2	1			1						
University of Notre Dame	Private not-for-profit	Doctoral Universities: Highest Research Activity	3	3									
University of Oklahoma	Public	Doctoral Universities: Highest Research Activity	2	1					1				
University of Pittsburgh	Public	Doctoral Universities: Highest Research Activity	1	1									
University of Pittsburgh, Johnstown	Public	Baccalaureate Colleges: Arts & Sciences Focus	3	3									
University of Puerto Rico, Mayaguez	Public	Master's Colleges & Universities: Medium Programs	4	4									
University of South Alabama	Public	Doctoral Universities: Higher Research Activity	7	4				1		1			1
University of South Carolina	Public	Doctoral Universities: Highest Research Activity	1	1									
University of South Florida	Public	Doctoral Universities: Highest Research Activity	1	1									
University of Southern Indiana	Public	Master's Colleges & Universities: Larger Programs	6	4			1			1			
University of Tennessee	Public	Doctoral Universities: Highest Research Activity	7	5					1				1
University of Tennessee, Chattanooga	Public	Doctoral Universities: Highest Research Activity	1							1			
University of Tennessee, Knoxville	Public	Doctoral Universities: Highest Research Activity	1									1	
University of Texas, Pan American			2	1			1						
University of Texas, Arlington	Public	Doctoral Universities: Highest Research Activity	4	2				1					1
University of Texas, Austin	Public	Doctoral Universities: Highest Research Activity	13	9		2					1	1	
University of Texas, El Paso	Public	Doctoral Universities: Higher Research Activity	4	3								1	
University of Texas, Rio Grande Valley	Public	Doctoral Universities: Moderate Research Activity	1										1
University of Texas, San Antonio	Public	Doctoral Universities: Higher Research Activity	4	1		1		1			1		
University of Texas, Tyler	Public	Master's Colleges & Universities: Larger Programs	8	4	2			1					
University of the Pacific	Private not-for-profit	Doctoral Universities: Moderate Research Activity	2	1							1		
University of Utah	Public	Doctoral Universities: Highest Research Activity	8	5	1	1		1					
University of Vermont	Public	Doctoral Universities: Higher Research Activity	4	1		1			1			1	
University of Virginia	Public	Doctoral Universities: Highest Research Activity	3	2									1
University of Washington	Public	Doctoral Universities: Highest Research Activity	1							1			
University of Waterloo	International		1										1
University of Wisconsin, Fox Valley	Public	Baccalaureate Colleges: Arts & Sciences Focus	1	1									
University of Wisconsin, Madison	Public	Doctoral Universities: Highest Research Activity	8	4		1						2	1
University of Wisconsin, Milwaukee	Public	Doctoral Universities: Highest Research Activity	1			1							
University of Wisconsin, Platteville	Public	Master's Colleges & Universities: Larger Programs	9	7				1					1
University of Wyoming	Public	Doctoral Universities: Higher Research Activity	10	4	1	1		1		1	1	1	
Utah State University	Public	Doctoral Universities: Higher Research Activity	3	2		1							
Valparaiso University	Private not-for-profit	Master's Colleges & Universities: Larger Programs	6	4			1			1			
Vanderbilt University	Private not-for-profit	Doctoral Universities: Highest Research Activity	9	5			2						2
Villanova University	Private not-for-profit	Doctoral Universities: Moderate Research Activity	7	5	1								1
Virginia Military Institute	Public	Baccalaureate Colleges: Arts & Sciences Focus	4	2			1						1
Virginia Polytechnic Institute (Virginia Tech)	Public	Doctoral Universities: Highest Research Activity	12	8	1	1					2		
Walla Walla College	Private not-for-profit	Master's Colleges & Universities: Medium Programs	2	2									
Washington State University	Public	Doctoral Universities: Highest Research Activity	13	9	1			1			1	1	
Wayne State University	Public	Doctoral Universities: Highest Research Activity	4	1	1							1	
Wentworth Institute of Technology	Private not-for-profit	Master's Colleges & Universities: Medium Programs	5	3							2		
West Virginia University	Public	Doctoral Universities: Highest Research Activity	6	1		1		1			2		1
Western Illinois University - Quad Cities	Public	Master's Colleges & Universities: Larger Programs	1				1						
Western Kentucky University	Public	Master's Colleges & Universities: Larger Programs	2	2									
Western Michigan University	Public	Doctoral Universities: Higher Research Activity	3	1			1	1					
Western Washington University	Public	Master's Colleges & Universities: Larger Programs	1	1									
Worcester Polytechnic Institute	Private not-for-profit	Doctoral Universities: Higher Research Activity	2	2									
Youngstown State University	Public	Master's Colleges & Universities: Larger Programs	4	3								1	
			912	497	48	47	48	48	24	48	48	48	56

Table B-1: Participating ExCEED Teaching Workshop Universities (Continued). The numbers highlighted in orange indicate a new school that had not previously participated in the ETW

Appendix C

John Aidoo	Elliot Douglas	JJ Johnston	Jack Puleo
Dan Andrews	Charles Duling	Tony Jones	Norm Pumphrey
Kevin Arnett	Findlay Edwards	Cullen Jones	Kate Purchase
David Barnes	Ege Egemen	Scott Katalenich	Craig Quadrato
Luciana Barroso	Steve Elgan	Crist Khachikian	Mohammad Qureshi
*Brock Barry	Jared Erickson	Kristoph Kinzli	Morgan Reese
Anthony Battistini	*Al Estes	Led Klosky	Richard Reid
Andy Bellocchio	John Evangelista	Kraig Knutson	*Stephen Ressler
Michael Bensen	Mark Evans	Gary Krause	Jenny Retherford
Stuart Bernstein	Jason Evers	Steve Kreh	John Richards
Stephen Bert	Clifton Farnsworth	Tara Kulkarni	Jennifer Righman McConnell
Celio Biering	Dave Fedroff	*Tanya Kunberger	CJ Riley
Adrian Biggerstaff	Gregg Fiegel	Keith Landry	Carolyn Rodak
Rhett Blackmon	Corinna Fleischmann	*Deb Larson	Phil Root
Al Bleakley	Bruce Floersheim	John Lawson	Cassie Rutherford
Jon Bodenhamer	Dan Fox	Will Lindquist	Dave Saftner
Daisie Boettner	Kevin Franke	Whitney Lutey	Ed Saliklis
Dave Borowicz	Aaron Freidenberg	Abraham Lynn	Joe Salinas
Jeff Braun	Seamus Freyne	Frank Mahuta	Matt Salveson
Elizabeth Bristow	Jon Fricker	David Martinelli	Kelly Salyards
Anthony Brizendine	Doug Gabauer	Brad McCoy	Jerry Samples
Jake Bruhl	Rich Gash	Shawn McElmurry	Marc Sanborn
Leslie Brunell	Lorintz Gleich	Clay McVay	Camilla Saviz
Aaron Budge	Patsky Gomez	Chris Meehan	Chris Schirner
Steve Burian	Ryan Goyings	Rich Melnyk	Christopher Schmit
Lynn Byers	Jim Grattis	Tom Messervey	Doug Schmucker
Chad Caldwell	Marv Griffin	Fred Meyer	Thomas Schumacher
Kristen Cetin	Decker Hains	Yvonne Miller	Steve Schweitzer
Adam Chalmers	Kevin Hall	Paul Moody	Berndt Spittka
Amy Chan Hilton	Richard Hallon	Matt Morris	Jeremiah Stache
Abby Charest	Matt Hallowell	Glenn Morrison	Joshua Steelman
Jill Cheney	Scott Hamilton	Audra Morse	Blake Stringer
Steven Chetcuti	*Joseph Hanus	Ken Murray	Steve Suhr
Young Chun	Steve Hart	*Roseanna Neupauer	Jeff Swab
Tony Cioffi	Beth Hartmann	Chuck Newhouse	Gunnar Tamm
Patricia Clayton	Hank Henderson	Tonya Nilsson	Brett Tempest
Chris Conley	Joshua Hewes	Wilfrid Nixon	Hans Thomas
Dawn Conniff	John Hildreth	Seth Norberg	Jason Toth
Carol Considine	*Aaron Hill	Brian Novoselich	Tara Troy
David Cottrell	Jerry Himes	Margaret Nowicki	Stephanie Vereen
Grant Crawford	Joe Hitt	Jim O'Brien	Joe Walchko
Steve Creighton	Marc Hoit	Pinar Omur-Ozbek	Brad Wambeke
Eric Crispino	Siegfried Holzer	*Bob O'Neill	*Ron Welch
Kristine Csavina	David Hurwitz	Charlie Packard	Jason Whipple
Julian Davis	Tara Hutchinson	Monica Palomo	Nate Wiedenman
*Norm Dennis	Mike Jackson	Jordan Peccia	Eric Williamson
Mark Derocchi	Kris Jaeger-Helton	Declan Phillips	Wes Williamson
Joel Dillon	Chad Jagmin	Thomas Piechota	Dave Winget
Sunanda Dissanayake	Tim Johnson	Bob Potter	Eric Wright
Donna Dorminy	Elsa Johnson	Jorge Prozzi	Victor Yu

*Served as Program Coordinator for one or more ExCEED Teaching Workshops

Table C-1. ExCEED Teaching Workshop Mentors and Assistant Mentors 1999-2017

Host Site	Program Coordinator
University of Arkansas	Norman Dennis
University of Colorado Boulder	Roseanna Neupauer
Florida Gulf Coast University	Tanya Kunberger, Robert O'Neill
Northern Arizona University	Debra Larson
United States Military Academy	Brock Barry, Allen Estes, Joseph Hanus, Aaron Hill, Stephen Ressler, Ronald Welch
University of Texas, Tyler	Ronald Welch

Table C-2. ExCEED Teaching Workshop Program Coordinators, 1999-2017

Angelo State University	North Carolina A&T State University	University of Colorado Boulder
Arizona State University	Northeastern University	University of Delaware
Brigham Young University	Northern Arizona University	University of Florida
Bucknell University	Norwich University	University of Illinois Urbana-Champaign
California Polytechnic State University, San Luis Obispo	Old Dominion University	University of Iowa
California State Polytechnic University Pomona	Oregon Institute of Technology	University of Limerick
California State University, Chico	Oregon State University	University of Minnesota Duluth
California State University, Los Angeles	Purdue University	University of Nebraska
California State University, Sacramento	Roger Williams University	University of Nevada Las Vegas
Colorado School of Mines	Rose Hulman Institute of Technology	University of New Mexico
Colorado State University	Santa Clara University	University of North Carolina
Florida Gulf Coast University	South Dakota State University	University of Southern Indiana
Florida State University	Stevens Institute of Technology	University of Tennessee
Iowa State University	SUNY Polytechnic Institute	University of Texas at Austin
Kansas State University	Texas A&M University	University of Texas at Tyler
Lehigh University	Texas Tech University	University of the Pacific
Louisiana Tech University	The Citadel	University of Utah
Michigan Tech University	Trine University	University of Virginia
Milwaukee School of Engineering	United States Coast Guard Academy	Virginia Military Institute
Minnesota State University, Mankato	United States Military Academy	Virginia Polytechnic Institute
Mississippi State University	University of Alabama	Wayne State University
Missouri University of Science and Technology	University of Alaska Fairbanks	Wentworth Institute of Technology
Montana State University	University of Arkansas	West Virginia University
New York City College of Technology	University of California - Irvine	York College of Pennsylvania

Table C-3. Partial list of Home Institutions Represented by ExCEED Mentors and Assistant Mentors 1999-2017