



Choose hio First

2011-2012 ANNUAL REPORT

Ohio

University System of Ohio
Board of Regents

John R. Kasich, Governor
Jim Petro, Chancellor



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Executive Summary

Science, Technology, Engineering, Math and Medicine (STEMM)-related disciplines are critical to the future success of the state of Ohio and the nation. Many employers in Ohio cannot find the STEMM talent they need to stay competitive and grow in the global marketplace. The primary objectives of the Choose Ohio First (COF) scholarship program are to support increased participation and retention of students majoring in STEMM and STEMM-education fields and, in so doing, to advance the economic growth of each region of the state. COF has become the state's premier model for recruiting and retaining talented students in STEMM and STEMM-education fields. The COF scholarship program ensures that an increased number of students enter into the STEMM teaching profession and graduate from some of the most innovative programs that the state has to offer.

To date, **nearly \$30 million** has been awarded to more than **5,500 COF scholars** attending an Ohio college or university. The institutions where the students are enrolled have contributed an additional **\$42 million dollars in cost-share** through June 2012. Matching funds are used to revise and develop new curriculum in the STEMM disciplines awarded COF funds; supplement student travel to industry conferences and research symposia; and leverage the involvement of businesses in the professional development of Ohio's future innovators. To date, **47 public and private campuses** have received COF funds.

The total number of STEMM degrees awarded at Ohio's public colleges and universities increased from 25,635 in FY 2007 to 35,615 in FY 2012.

The **Woodrow Wilson Teaching Fellowship** institutions, including John Carroll University, the University of Akron, the University of Cincinnati, the Ohio State University, Ohio University, the University of Toledo and the University of Dayton, are poised to produce more than **300 highly qualified teachers** in mathematics and science, with the potential to impact the lives of thousands



of secondary students. In the 2012 cohort year, more than 2,000 individuals applied for Fellowships. The applicant pool included individuals with advanced degrees, dean's list and honors graduates, and career-changers who left established STEMM careers to join the teaching profession. The COF Woodrow Wilson Teaching Fellowship program is made possible through COF, the Race to the Top initiative and **\$2.4 million dollars in support from private foundations.**

Recently, as part of Ohio HB 198 changes for care in the state of Ohio, the **Primary Care Scholarships in Medicine and Nursing** were launched as another arm of COF. To combat a statewide shortage of primary physicians and advanced practice nurses, the program will offer scholarships to **50 medical students** for four years of medical school and **30 nursing students** for three years of graduate education. The recipients agree to remain in the state post-residency for no less than three years and work in practices that accept Medicaid patients. These COF scholars will potentially impact the lives of thousands of Ohioans and positively affect the quality of care provided in high-need areas around the state. The participating medical schools are the Ohio State University, Case Western Reserve University, Northeast Ohio Medical University, the University of Toledo, Wright State University, Ohio University and the University of Cincinnati. The participating nursing schools are the University of Akron, Kent State University, Ohio University, the University of Toledo and Wright State University.

The impact of STEMM-centered programming, such as the COF Scholarship Program, is evident. While the overall statewide college enrollment dropped this academic year by 5.9 percent from the levels of the 2011-2012 academic year at Ohio's public colleges and universities, the total number of STEMM degrees awarded at Ohio's public colleges and universities has steadily **increased from 25,635 total students in FY 2007 to 35,615 total students in FY 2012**, representing a 38.9 percent increase. COF has proven to be an effective strategy to ensure that STEMM degree attainment continues to rise.



Programs of Innovation

All COF campuses offer innovative approaches to instruction and retention in the STEMM majors eligible for scholarships. Several new campuses have joined in the commitment to exceptionally prepare Ohio's future innovators in high-demand fields, including **petroleum engineering, geological sciences, health information management and bioinformatics**. Six new campuses started offering scholarships in the fall of 2012 – Heidelberg University, Franklin University, Ohio Northern University, Notre Dame College, Washington State Community College and Zane State College. Summer bridge programming, mentoring opportunities, research projects, co-operative learning offerings and internships are just a few examples of the holistic approach to STEMM education in the new and continuing COF programs around the state.

Just as the campuses offering COF Scholarships are expanding, so too are the demographic characteristics of the students served. More students from disadvantaged backgrounds are benefitting from COF funds. The number of females in COF exceeds the national state average of females who participate in STEMM disciplines. Students of a wide range of ages and ethnicities, from almost every corner of the state, are taking advantage of the opportunity that COF provides. The Ohio Board of Regents will continue to encourage more institutions to apply so that more students at more campuses can benefit from COF funding.

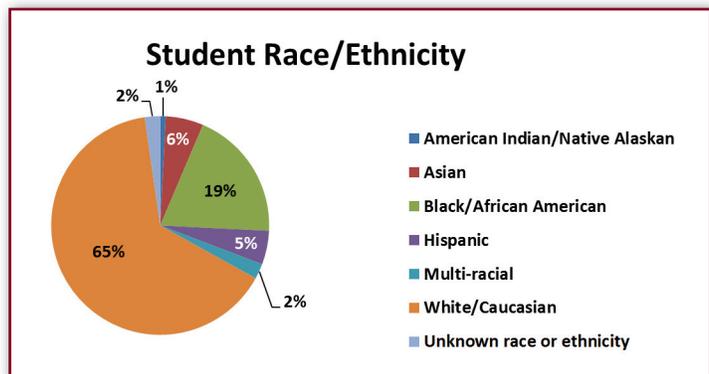
Nearly 45 percent of COF Scholars participate in a cooperative learning opportunity, an internship or a real-world research project in collaboration with a business/organization or faculty. More than 42 percent of the students who participate in a hands-on learning opportunity are female, which bolsters the notion that interaction and familiarity with applicable knowledge in STEMM fields will help attract and keep a diverse workforce.

At Baldwin Wallace, nearly two-thirds of all COF students are first-generation, low-income or underrepresented minorities; the overall retention rate in STEMM for these students is 93%.

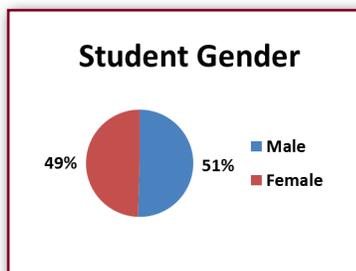


Demographic Data

More than 35 percent of COF scholars are from a racial or ethnic minority. Several programs have the sole focus of increasing the number of ethnic minorities in the STEMM fields, including the DO-STEM project at Central State University. More than 19 percent of COF scholars are African American and five percent are Hispanic/Latino. While the American Indian population in COF is still relatively low at one percent (29 students), the number of American Indian students has increased by 400 percent since the start of COF. Reporting on student race/ethnicity has improved since the start of COF; the number of students reported to be of unknown race/ethnicity has decreased to two percent (80 students) since a high of 211 in the 2008-2009 academic year.

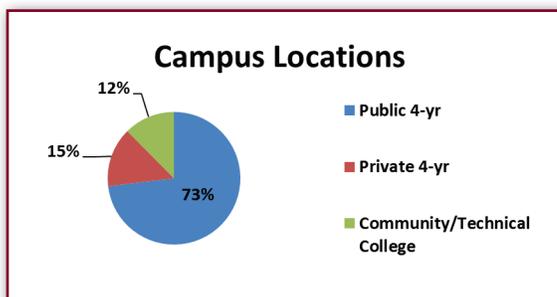


Campuses are collecting more detailed information about the students they serve, including enrollment by gender. Approximately 49 percent of COF scholars are female. The proportion of females participating in COF matches their share of the college-age population in the state (49 percent), and exceeds the average of all females earning STEMM degrees in Ohio (28 percent). Nearly 11 percent of male COF scholars choose non-traditional career fields for males such as nursing and teaching. **More than seven percent of COF scholars are non-traditional students, including those over the age of 25 and those who are displaced workers retraining for a new career.** The majority of non-traditional students (89 percent) study at Ohio's community and technical colleges (two-year institutions).

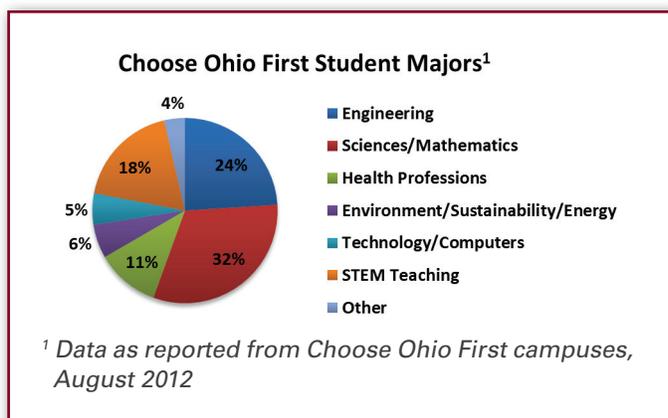




Nearly 13 percent of all COF scholars are enrolled at a community or technical college. Of the students who enrolled at a participating two-year campus, nearly 27 percent (as reported by campuses) moved on to programs at the baccalaureate level in STEMM fields. Nearly 16 percent of COF students participated in programs at a private college or university.



Nearly 70 percent of COF Scholars are in majors linked to one of the JobsOhio industry sectors: BioHealth, Energy, Polymers, Aerospace & Aviation, or Information Technology.



STEMM teaching students comprise 18 percent of COF scholars. Students entering environmental technologies or energy majors increased from two percent in 2010-2011 to six percent in 2011-2012. More than 350 COF scholars are graduate students, which will help to ensure that the pipeline of STEMM faculty at the postsecondary level will not fall short.



Program Descriptions

COF offers programs in hundreds of majors at campuses that touch every region of the state. There are themes or clusters present among the COF program, and it is easy to identify the main focus of each program.

1. **Several COF programs reach out to secondary students to ensure early exposure to concepts and subjects central to success in the STEMM disciplines.** These programs reach out to middle and high school students; helping them to see value in a STEMM career and to provide them with the tools necessary to succeed is critical to increasing the number of STEMM graduates in Ohio. For example:

- **#08.04 - Integrated Science Training for Northeast Ohio's Future Biomedical and Biotechnology Workforce** (Kent State University, Stark State College, Lakeland Community College, Cuyahoga Community College, Lorain County Community College)

- » This project led by Kent State University hopes to increase the number of high school students who choose biology, biotechnology, chemistry or physics as their major; improve retention in the sciences; and establish new pedagogical initiatives.
- » By providing students with an interdisciplinary learning experience and the opportunity to be engaged in living/learning communities, the project will increase the number of underrepresented students in science.
- » A pathway from the community college to a four-year university is made clear to students who are non-traditional and may be returning to school after a long absence.

The number of Kent State University freshmen who majored in biology, biotechnology, chemistry or physics increased 24 percent between fall 2010 and fall 2011.



- » **The students engage with middle and high school classes to encourage interest and proficiency in STEM fields.** Efforts include: the development of inquiry-based continuing education experiences for partnering middle schools' teachers (MSTIK); the donation of equipment to middle school students; and the creation and development of innovative education tools, workshops and laboratory experiences for the secondary classroom.
- » The retention rate for biotechnology science students at Lakeland Community College now exceeds **90 percent**.
- **#08.09 - Student Success in Mathematics** (Cleveland State University, University of Akron, Case Western Reserve University, Kent State University, Youngstown State University, Cuyahoga Community College)
 - » The project led by Cleveland State University engages students early on, as mathematic preparedness is the single best predictor of success at the college level in any discipline.

At Youngstown State, the six-year graduation rate for the College of STEM is 46.77%; the COF cohort graduation rate is 73.68%.
 - » This program's **outreach efforts center on a summer bridge component, partnerships and dual-enrollment opportunities with high schools, in order to ensure that an increased number of entering college freshmen are proficient in mathematics.** In terms of being awarded a COF scholarship, high priority is given to students who completed the Choose Ohio First Scholarship Program (COFSP) Summer Bridge program as juniors in high school.
 - » Students complement their academic studies with internships and undergraduate research opportunities, both at and outside of their respective institutions. A scholar who participated in the Summer Bridge from a high-poverty high school has a research paper accepted to a peer-reviewed journal of an international environmental conference. Another scholar received a paid Research Experience for Undergraduates opportunity from the National Science Foundation.



- » Numerous community engagement alternatives are given to COFSP scholars, including volunteering with programs offered by the Martha Holden Jennings Foundation, the National Inventors' Hall of Fame, the Igniting Streams of Learning Science (ISLS) Summer Teaching Institute and the Explore Robotics program.

“The COF scholarship was one of the deciding factors to come to Case. I had been accepted by Brigham Young University and was even finding an apartment.”

- Case Western Reserve University Student

- **#09.08 – The Cincinnati STEMM Hub Partnership**
(University of Cincinnati)

- » High school students who enter the program are “Cincy STEM Fellows” and are required to attend a minimum of two classes over the summer, which may be used for credit toward their future secondary math or science education degree.
- » The University of Cincinnati works collaboratively with Taft Elementary and Hughes STEM High School, enhancing the quality of STEMM instruction by providing research-based STEMM coursework for all teachers in all disciplines.
- » The program encourages future teachers to consider teaching in an urban area (particularly Cincinnati) and will eventually serve as a pipeline to the African-American Initiative in Math/Science II (AAIMS II).
- » Investigates the efficacy of an innovative model of STEMM teaching preparation, beginning with project-based, real-world STEMM learning experiences in K-12.



- **#09.38 – Improving Retention and Learning of STEM Students through Learning Communities** (Hiram College, Kent State University, University of Akron)
 - » The main goal of Hiram College and its COF partners is to encourage Igniting Streams of Learning in Science (ISLS) high school alumni to pursue STEM majors in college.
 - » The project has already met more than 125 percent of the proposed recruitment goal.
 - » ISLS offers high school students an opportunity to learn about scientific concepts early in their secondary education. Once on a postsecondary campus, the COF scholars participate in STEM communities to support optimal learning and outcomes.
 - » **The project is using the data collected from the COF scholars to evaluate the effectiveness of the learning community pedagogy as a way to enhance learning.**

 - 2. **COF projects offer a mechanism for students to be engaged in a rigorous academic curriculum, while gaining real world experience applicable in a STEM field.** Offering students flexible class options and diverse teaching methods allows students to be focused in the classroom and focused while participating in a cooperative learning opportunity or internship. This early exposure to the real world applicability of their major reduces the likelihood that graduates will choose employment in another field. For example:
 - **#08.29 - Growing the STEM Pipeline in the Dayton Region – Becoming an International Center of Excellence for Human Effectiveness/Human Performance** (Wright State University, Central State University, Clark State Community College, Edison Community College, Sinclair Community College, Southern State Community College, University of Dayton, Wittenberg University)
 - » Led by Wright State University, the partnership **employs a curriculum-sharing model** via the creation of the Dayton Area Undergraduate Studies Institute (DAUSI), modeled after the very successful Dayton Area Graduate Studies Institute (DAGSI), **to provide all COF scholars,**
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no matter their home institution, **easy and affordable access to curricula** in targeted STEM areas.

- » Students are becoming well-rounded STEM scholars through internships and co-ops at Dayton-area employers, including Wright Patterson Air Force Base, GE, Booz Allen & Hamilton, Miami Valley Hospital and many others.
 - » COF scholars are engaged in professional-level work, including writing for and being involved with National Science Foundation grants; attending and presenting at national conferences, and taking professional-level examinations (e.g., the Fundamentals of Engineering test) prior to graduation. **Internship, co-op, research and service learning roles totaled more than 8,600 hours.**
- **#08.27 - Choose Ohio First for Engineering Entrepreneurship (COFFEE) Scholarship** (University of Toledo, Ohio State University, Stark State College, Lorain County Community College, Owens Community College)
 - » Led by the University of Toledo, the program equips students with the education necessary to simultaneously work on their engineering or science degrees and learn the entrepreneurial skills necessary to translate their innovations into economic growth for Ohio.
 - » COFFEE scholars are selected based on academic ability, financial need and a diversity approach that is reflective of Ohio's general population.
 - » All COFFEE scholars participate in a formal co-op or internship program.

“I have... my summer internship with Chesapeake Energy in Canton, Ohio on the Utica Shale in the natural gas industry. I have learned more than I could have ever dreamed.”

**- Student,
The Ohio State University**



- » Employers of COFFEE scholars in 2011-2012 include Chesapeake Energy, Cisco, Dow Corning, DuPont, GE Aviation, JM Smucker Company, Procter & Gamble and many more.
 - » COFFEE scholar Jason Owens and his company, Resonance Group Ltd., were honored at the annual UT Innovation Enterprises Challenge Business Plan Competition.
- **#08.08 - COF Engaged Program in Bioscience and Healthcare** (Cleveland State University, Baldwin Wallace University, Case Western Reserve University, Cuyahoga Community College, Hiram College)
 - » Cleveland State University, along with public and private partners, trains students along interdisciplinary bio-related and healthcare-related STEM pathways and addresses complex challenges in bioscience and healthcare.
 - » This collaboration creates a continuum of educational opportunities that support and accelerate regional economic development priorities in healthcare.
 - » This program has a **strong focus on experiential learning**, requiring that students participate in research, varied entrepreneurship activities/training, and **co-ops/internships with partnering companies such as Jumpstart, BioEnterprise and the Cleveland Clinic Foundation** (36 percent of the COF scholars participated in an internship or co-op).
 - » Out of 48 COF scholars that conducted research, **100 percent presented their research at scientific symposia**. COF students are also given opportunities to pitch their ideas to relevant businesses in order to win competitive funding.

“Without this [COF] support my involvement in two new research and entrepreneurship experiences may not have come to fruition. We are seeking a limited patent for one of our developed projects.”

- Kellie,
Cleveland State University



- **#08.10 - Science and Math Education in ACTION** (Bowling Green State University, University of Findlay, Terra Community College, Northwest State College, Owens Community College)
 - » Bowling Green State University (BGSU) and partners have created an innovative program that will increase the number of highly effective science and math teachers in Ohio.
 - » BGSU's program requires that scholars participate in a **residential summer bridge program before their freshman year, a group research project during their freshman year, a business/ industry practicum (partners include BioFit, DayMark, Sysco, Conagra, Tec^Edge, etc.) during their sophomore year, and a pedagogical research project during their junior/senior years**, to ensure continued engagement and practical learning experience throughout their undergraduate career.
 - » The fall 2011 cohort of COF scholars is the most advanced yet when compared to other incoming freshmen. At BGSU, the incoming COF scholars have an **average high school grade point average (GPA) of 4.06 compared to a 3.25 high school GPA** of other incoming freshmen. The average ACT composite score of Cohort 3 scholars is **27.8, compared to a 22** score for other incoming freshmen.
 - » The median GPA for the COF scholars was **above 3.5**.

 - **#08.15 – COF for Bioinformatics** (Ohio University, University of Akron, Case Western Reserve University, Ohio State University, Shawnee State University, Wittenberg University, Wright State University, University of Toledo, Central State University, Miami University, University of Cincinnati, Bowling Green State University, Clark State University)
 - » Ohio University and partners enhance the interaction between departments to positively impact the students' educational experience. Faculty is centrally involved in mentoring and meeting with students weekly.
 - » A pipeline program has been established to allow students to **earn a BS and a master's degree in Bioinformatics in 5.5 years**.
 - » Students must **actively conduct research** and present their findings at industry conferences every year. Several students have co-authored research papers and presented at professional conferences.
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- » Students are required to participate in the Great Lakes Bioinformatics Conference (GLBIO), which promotes computational biology and bioinformatics within the eight U.S. states and two Canadian provinces that comprise the North American region.
- **#08.33 – Building the Nursing Workforce in Northeastern Ohio** (Case Western Reserve, Cleveland State University)
 - » Case Western University and Cleveland State aim to increase the number of doctoral nursing students, or COF Nursing Fellows, in the northeastern part of the state.
- **#09.25 – Building Ohio’s Sustainable Energy Future** (University of Toledo, Bowling Green State University, Owens Community College, Terra Community College, Northwest State Community College)
 - » The University of Toledo and partners aim to increase the number of undergraduates prepared for careers or further graduate training in areas related to renewable energy and the environment.
 - » Entering freshmen participate in the Academic Investment in Math and Science (AIMS), which has been shown to increase their academic performance during the first year.
 - » Students at community colleges in the region (i.e., Owens, Terra and Northwest State) have access to coordinated program content and advising activities so they can easily enter baccalaureate degree programs at the partner four-year institutions.
 - » The program places emphasis in the selection process on women and minorities in order to increase the presence of underrepresented

“This is/was an excellent opportunity for students to carry out cutting-edge bioinformatics research...research, such as microarray, next gen sequencing are fairly expensive.”

- Student,
University of Akron



and underprivileged groups prepared for careers in renewable energy and the environment.

- » **Students have completed internships at Xunlight, Solargystics, First Solar and other companies, working on real-world environmental issues.**

- **#08.03 – Strengthening the STEMM Pipeline through Student Preparation, Awareness, Teacher Education and Building Partnerships with K-12** (University of Cincinnati, Cincinnati State Technical and Community College)
 - » The University of Cincinnati is dedicated to significantly increasing the higher education participation and success of students entering STEMM through the Tech Prep Consortium pathway.
 - » The innovative academic supports aim to increase the participation and preparation of students entering PK-8 STEMM teaching careers, create highly qualified mathematics and science teachers for grades PK-8, prepare teachers to be expert mentors and coaches in STEMM education, and increase the retention of math and science teachers in Ohio.
 - » **Resources are provided that expand access to STEMM majors, STEMM co-op and internship placements, innovative academic support programs, and an ambitious advising and mentoring structure.**
 - » Three graduating scholars have accepted STEMM teaching positions in Ohio!

“I am grateful for receiving the scholarship...I always loved math and science..., so I am very happy I have the opportunity to pass my love of these subjects on to the coming generations.”

**- Student,
University of Cincinnati**



3. **Non-traditional students and those underrepresented in higher education, including low-income or first-generation students, are given the opportunity to excel as a result of COF.** Programs offer the financial assistance necessary for at-risk students to enroll and remain in postsecondary education, while ensuring students are engaged in a rigorous curriculum that prepares them for employment. For example:

- **#08.13 – The “Innovation Alliance: STEMM Undergraduate Engagement in an Engineering Environment”** (University of Akron, Baldwin Wallace University, Stark State College, Lorain County Community College)

- » **Institutional cost-share is dollars used for administration, advising, facility upgrades and other important needs of the COFSP. UA provides an annual operations budget of \$200,000 for COF.**

- » To date, the Alliance has served **2,273 unduplicated students** through COF.

- » The project’s goal was to have at least 70 percent of participants with a four-year STEMM degree and at least 30 percent of the participants with an associate degree. So far, the project has an 82 percent graduation rate.

- » Potential scholars at UA are given even greater consideration if they are socioeconomically disadvantaged, veterans or transfer students from out of state. Because of this and other outreach factors, **this program has a particularly high concentration of first-generation student scholars (58 percent at UA, 64 percent at BWU), non-traditional and veteran students (15 percent at UA), and minority students (26 percent at UA).** The program has also had success in enrolling students from Appalachia (3 percent at UA).

- » Baldwin Wallace University has experienced a **net increase in STEMM disciplines from 11.6 percent of the student body to 14.7 percent since the inception of COF.**

“I couldn’t have asked for a more supportive community...one I’m committed to even after graduation.”

- Brittney, University of Akron 2012 Graduate



- » The Alliance at University of Akron is one of the few COF programs with full-time, dedicated staff. **The director, educational specialists and secretary all are full-time.** There are also 10 peer mentors that are part of the team.
 - » **In the 2011-2012 academic year, the graduation rate for COF students who were eligible was 100 percent.**
 - **#08.20 – “Diversifying Ohio in STEMM (DO-STEM)”** (Central State University, Sinclair Community College, Cuyahoga Community College, Miami University, University of Cincinnati, Kent State University, Youngstown State University, Clark State University)
 - » Central State University and partners **place significant emphasis on recruitment of minority scholars, particularly African Americans, who comprise the vast majority of this program’s student base (88 percent).**
 - » **Central State has a retention and graduation rate of 83 percent over the four years of the program.**
 - » CSU undergraduate scholars are required to participate in graduate school visits and professional workshops as a condition of their scholarships. Similarly, Sinclair Community College scholars engage in regular meetings.
 - » While this program’s scholars are not required to participate in an internship, a number have done so, both in and out of the state. **Employers include ZIN Technologies, Avetec, Wright Patterson Air Force Base, NASA and Los Alamos National Laboratories.** Scholars are also given the opportunity to work at national research laboratories through National Science Foundation and National Nuclear Security Administration grants.
 - » **Central State University has seen its overall STEMM student enrollment grow from 229 in 2009 to 528 in 2011.**
 - **#08.02 – “Diversifying Yield and Retention in Engineering, Mathematics and Science”** (University of Cincinnati)
 - » The University of Cincinnati’s (UC) program was used to leverage a \$2 million NSF Type 1 STEP grant.
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- » The significant retention efforts begin with a recommended **seven-week bridge program for socioeconomically disadvantaged and first-generation scholars and/or a more targeted virtual program for those whose math placement test scores were low (ALEKS)**. ALL summer bridge students enroll in Supplemental Cooperative Learning Courses in calculus, chemistry and physics.
 - » **All scholars are expected to participate in six quarters of co-op work**, expanding on the strengths of UC's well-established co-op program. The development of a Corporate Mentoring Program increases the STEMM internships available for COF scholars and has resulted in a mentoring practice model that can be used throughout the state.
 - » All scholars are required to participate in 10 hours per quarter of volunteer service, **aimed at strengthening ties to the community and gaining greater social/ cultural understanding**.
 - » The program has identified **best practices** that may aid other programs in attracting, retaining and graduating STEMM scholars, including 1) monitoring academic progress at regular intervals, 2) offering first-year and sophomore learning communities (could be living/learning), 3) mandatory bridge programming, and 4) scheduling individual meetings with a program coordinator as intervention and support.
- **#09.09 – Creating Affordable and Effective Educational Pathways in Information Technology** (Wilmington College, Cincinnati State Technical and Community College, University of Toledo)
 - » Wilmington College and partners are working to create seamless pathways between public and private campuses, and two-year and four-year institutions, in order to dramatically increase the number of low-income and first-generation students that enter into information technology.
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- **#09.17 – STEM Degrees and Careers for Ohioans with Disabilities, including Veterans: COF Scholarships in Support of the NSF-Funded Regional Alliance in Disability (OSAA)** (Wright State University, Ohio State University, Sinclair Community College, Columbus State Community College)
 - » Ohio's population of persons with disabilities is a largely untapped resource for meeting the demand of STEM professionals for the state.
 - » **Leveraged the COF dollars to obtain OSAA National Science Foundation funding.**
 - » **Students with disabilities are recruited into STEM majors** and transitioned through the use of STEM academies, learning communities, mentoring and residential experiences on campus to develop independent living skills.
 - » Ability Advising allows the institution to meet the needs of the student through review of academic progress, arranging technological accommodations and tutoring assistance. The Ability Advising also fosters tailored opportunities for STEM co-op and internship experiences.

 - **#09.28 – Choose Appalachian Teaching (CAT)** (Ohio University, Marietta College, Muskingum University, Shawnee State University, University of Rio Grande)
 - » The program led by Ohio University aims to strengthen the regional capacity of rural southern and eastern Ohio (Appalachia) by providing scholarships, particularly for first-generation students, to pursue undergraduate degrees.
 - » The CAT program combines its annual research symposium with student research from the Noyce Scholarship program and the Woodrow Wilson Teaching Fellowship.
 - » A Freshman Learning Community has been established to support CAT scholars. **Webinars and videoconferencing have also been used to connect students from the various partner campuses** to help close the distance gaps present in rural Ohio.
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4. **Nearly 13 percent of the COF students spent the 2011-2012 academic year at a community or technical college.** Displaced workers often have to make tough choices about their education and the feasibility of entering careers that require additional training. The presence of COF on a community college campus increases the likelihood that laid-off workers will return to school to either enhance their skills for employment in their current industry or be trained for a different career field altogether. As examples:

- **#08.41 – The “URG COF STEMM Scholarship Program”** (University of Rio Grande, Rio Grande Community College, Hocking College, Ohio University)
 - » The University of Rio Grande, Rio Grande Community College, Hocking College and Ohio University show a **median GPA of 3.53** for students in the program.
 - » The RGCC Scholars in Nursing, Fine Woodworking and Power Plant Management programs have **completed internships with local companies, including Holzer Clinic, Health System, Adena Ventures and American Electric Power.**
 - » All COF scholars are required to attend at least two seminar/colloquium series presentations. **One scholar presented her research to the entire Rio Grande faculty and the board of trustees.**

- **#09.41 – “Future Scientists of Ohio”** (Ohio State University, Columbus State Community College)
 - » The Ohio State University and Columbus State Community College aim to support non-traditional and low-income students in STEMM by providing them a pathway to higher education from a two-year to a four-year campus.
 - » Approximately **27 percent of the students are from underrepresented groups. Fifty percent are first-generation students** pursuing STEMM degrees.
 - » Approximately 90 percent of the scholars met the requirements to have their scholarships renewed for the second year.
 - » All students in this program begin at Columbus State, including a **bridge program** that prepares returning students for the rigor they



soon will encounter. The collaboration has also implemented a mandatory **mentoring program** to better address the needs of their unique population.

- » Ohio State offers shared courses to students, and research experiences are offered on site for Columbus State's students.
 - » **The COF program was used as leverage for a STEP NSF grant.**
 - » Four students participated in the Wright-Patterson Air Force Research Lab summer internship.
 - » Despite their unique challenges, two scholars completed their bachelor's degrees (after transferring community college credit) within the three years the program has been in existence. **One scholar was accepted to the OSU School of Pharmacy and the other was accepted to Ohio University's Medical School.**
- **#09.06 – Enhancing the Success of Future Health Professionals through Synergistic Cross-Collegiate Programming** (University of Cincinnati, Cincinnati State Technical and Community College, Sinclair Community College)
 - » The University of Cincinnati, primarily through its branch campuses and collaboration with two community colleges, is engaging with an increased number of students with a high academic caliber from diverse and economically disadvantaged backgrounds. First-generation scholars who meet all other requirements are given priority status.
 - » The average GPA is 3.65 for the rising junior COF scholars. The average cumulative GPA for **retained freshmen at the University of Cincinnati is 3.67**. In addition to maintaining high academic standards, students must also attend workshops, seminars and presentations.
 - » Students participate in clinical experiences at medical and rehabilitation facilities. **ALL students are required to complete presentations as a part of the program.**



- » A study conducted with a random sample of COF and non-COF students in the College of Allied Health Sciences showed:
 - Average COF GPA = 3.40
 - Average Non-COF GPA = 3.13
 - Average retention for COF group = 93 percent
 - Average retention for non-COF group = 90 percent

5. **Nearly 16 percent of COF scholars are housed at Ohio’s private colleges and universities.** Partnership and collaboration among the University System of Ohio’s public colleges and universities and private institutions around the state have resulted in more students being served, and more efficient use of Ohio’s fiscal and human resources. For instance:

- **#08.33 – “Building the Nursing Workforce in Northeastern Ohio”** (Case Western Reserve University, Cleveland State University)
 - » Case Western Reserve University and Cleveland State University are addressing a particular workforce need of their region within the state.
 - » **This program consists entirely of graduate programs in nursing,** students for which are recruited from the partner institutions’ BSN and accelerated degree programs.
 - » The aim is to increase not only the number of qualified candidates for nursing positions, but also **the future number of individuals qualified to teach in such degree programs.**
 - » COF scholars must engage in a research project, in conjunction with senior researchers, and are also encouraged to attend local and regional events related to the field of nursing.
- **#08.35 – “Pharmacy Scholarships”** (Ursuline College, University of Toledo)
 - » Students enter into the pre-pharmacy program at Ursuline with the understanding that they will be admitted into the Bachelor of Science for Pharmacy Sciences (BSPS) program at the University of Toledo after their second year.



- » Pharmacy Camps are held for rising high school seniors to encourage them to enroll in the program.
 - » **Approximately 51 percent of the students at Ursuline College are first-generation, underrepresented students.**
 - » The recruitment activities focus on students who are from underrepresented backgrounds, including first-generation students and those from high schools identified as Continuous Improvement, Academic Watch or Emergency. **The retention activities include mentoring, entrance into professional organizations and programs targeted toward the background of the student (first-generation connections, cultural awareness, etc.).**
 - **#08.23 – Ohio House of Science and Engineering: Success in STEMM through Collaboration COF Scholarships** (Ohio State University, Muskingum University, University of Cincinnati)
 - » The project has built a strong community of STEMM scholars from more than 25 majors (205 students).
 - » The **retention rates** for the COF program are notable (**90 percent at OSU**).
 - » Of the graduating students at OSU (13 students), all accepted jobs or were accepted into professional school prior to graduating.
 - » Through the mentoring program, the COF scholars have directly impacted the lives of other students throughout the state. Working with five elementary schools and two high schools, the preliminary feedback from the sites suggests that **90 percent of students who participated in the tutoring/mentoring sessions showed an increased interest in attending college.**
 - **#09.36 – Northeast Ohio Biosciences Pathway Initiative** (Ashland University, Ohio State University, North Central State College, Lakeland Community College)
 - » Ashland University and its partners will prepare bioscience workers who will sustain regional economic development in agricultural bioscience and research/testing/medical laboratories (RTML).
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- » By the end of the first year, COF students are expected to have a GPA of 3.0 or better. By the end of their second or third year, the expectation is a **3.25 GPA or higher**.
- » The program at Ashland has substantially **increased the number of incoming students with a declared major in the bioscience areas**.

6. **COF offers graduate students an opportunity to excel in STEM fields. Graduate students comprise approximately 14 percent of the total number of COF students**, an assurance that individuals seeking to obtain advanced degrees in subjects such as engineering, science, mathematics, etc. are able to receive financial assistance from this program as well. As examples:

- **#08.12 – “Improving STEM Teacher Preparation: A Long Term Investment (D-STEM)”** (Miami University, Cleveland State University, University of Toledo, Cincinnati State Technical and Community College, Cuyahoga Community College, Owens Community College)

- » This partnership improves the STEM teaching force by increasing the number of highly qualified new teachers through a high-caliber education, diversifying the STEM teaching pool and decreasing the attrition rate of STEM teachers through their induction period.
- » Current students provide tutoring support at the secondary level and **are engaged in activities that cultivate teachers for urban environments**.

“I hope that others may continue to benefit from these scholarships and that it helps the state maintain a body of dedicated professionals teaching science.”

**- Elizabeth,
The Ohio State University**



- » Students pursuing graduate degrees in environmental science and chemistry **are preparing to pursue careers in research and ultimately the professoriate.** Scholars are involved with learning communities that provide enrichment opportunities, enhanced academic support and access to innovative courses designed specifically to enhance the STEM experience.
 - » The **UT program centers on a rigorous, field-based program** and was a key element of the Woodrow Wilson Teaching Fellowships awarded to the campus.
 - » The project also provides scholarships to existing STEM teachers who are interested in a master's degree and/or endorsements in their subject areas.
- **#09.07 – Master's Degrees as Conduits to Recruiting, Retaining and Upgrading the Ohio STEM Workforce** (University of Cincinnati)
 - » The University of Cincinnati program is designed to attract students into a master's program and ultimately medical school, with the goal of retaining more Ohioans with advanced degrees.
 - » With a goal to recruit more underrepresented and economically disadvantaged students into the field of medical physics, the program has established partnerships to identify eligible undergraduates through the active engagement of minority alumni.

“Choose Ohio First...help[ed] me further my education with financial support. But it has also provided personal support...to help students improve.”

- Terrell, Spring 2012 Bachelor of Science Graduate in Physics



- **#09.26 – Engineering Across the Pipeline** (Cleveland State University, Baldwin Wallace University, Ursuline College)
 - » The goal for the program is to increase the number of students entering the engineering profession at the graduate level through the use of an **accelerated “4+1” model**.
 - » Each COF student’s experience is customized, with one-on-one interactions to identify opportunities and connections, incorporate activities and tailor events toward specific majors.
 - » The number of students pursuing STEMM (in the target disciplines) at the partner campuses has increased from an average of 11.6 percent to 14.7 percent since COF’s inception.
 - » Course enrollments and grades are reviewed mid-semester and at the end of the semester to identify opportunities for additional supports that will increase student success.

- **#08.01 – Coming Out of the Pipeline: The UC Interdisciplinary Pathway to STEMM Professionals** (University of Cincinnati)
 - » The University of Cincinnati has an overarching goal of generating an experiential pathway to a STEMM career focusing on students in the mid- to late-collegiate undergraduate years as well as in graduate education.
 - » By providing co-op opportunities, students are given direct employment experience in STEMM by Ohio companies that donate \$10 million each year in support of UC STEMM students, including the COF scholars.
 - » Educational collaborations between STEMM and non-STEMM (e.g., business, design) give students enhanced value in the workplace. From an early stage of their education, students learn the connections between designers, engineers and medical professionals for medical device innovation projects.



The Economic Impact of Choose Ohio First

A 2011 analysis of the COF program by *Tripp Umbach* found that the program is having a positive impact on the state's economy. The analysis conservatively estimates that receipt of COF funds led to the support of **477 jobs and more than \$59 million in economic output within the state**. Economic output includes the institutional expenditures made for COF scholars, the personal spending of staff and students of the program, labor income from the co-op/internship opportunities, innovations and entrepreneurship opportunities led by COF scholars, and other local economic activity. By the same conservative estimates, it was found that by 2016, COF programs will lead to the support of **843 jobs, more than \$110 million in economic output around the state and \$4.5 million in state and local tax revenue**. These are conservative estimates based on annual impacts and do not take into consideration cumulative impact. Moderate and aggressive estimates trend much higher.

Several evaluations led by external entities support the continuation and expansion of COF scholarships. In a study conducted by *The Strategy Team, Ltd. for the Ohio Board of Regents* at the end of 2010, students positively attributed COF with strengthening the existing levels of STEMM interest in the scholars and with attracting the attention of scholars who may not have seriously considered STEMM. The scholarship also appeared to have a greater influence on the students' choice of institution and major declaration. This is good news for Ohio employers.

Tripp Umbach's COF study included several interviews with business leaders; out of the 25 leaders interviewed, a majority (16 leaders) would prefer to hire graduates from Ohio colleges and universities. However, they are unable to find the science, technology, engineering and mathematics talent necessary to remain competitive. According to a report by the National Science Foundation in 2003, Ohio was in the bottom quartile for the percentage of science and engineering degrees conferred. Ohio's economic prosperity hinges on the development of talent in STEMM. Nine out of the 25 employers interviewed indicated they would employ talented candidates regardless of whether they are in-state or out-of-state. However, it is important to note that employers, no matter the preference to hire from within Ohio, view COF potentially as a key factor in helping meet workforce demands locally.



Choose Ohio First: Keeping the Momentum

The COF Scholarship Program aims to continue the positive momentum of the past four years. When possible, opportunities for the growth and expansion of the program are highly encouraged. Numerous inquiries about COF continue to come in at the state level, and campuses report that the substantial progress in marketing COF using social media and other online materials has resulted in increasing numbers of applications for the scholarship each year. As such, the requirements and expectations for COF students have become more rigorous, but the intention of the program to increase access to high-achieving, first-generation, low-income and underrepresented students has remained. The average GPA for a COF scholar in the 2011-2012 year was 3.077.

There have been nearly **700 graduates from the COF Scholarship Program** since its inception. Of this number, 208 plan to enter graduate school (the majority in Ohio; several COF students have been heavily recruited by out-of-state institutions such as Johns Hopkins University, MIT and Cornell University). **More than four hundred COF graduates (449 total) have either found employment in STEM in Ohio or plan to remain in the state to contribute to the workforce.** Only 13 students reported accepting out-of-state. Although this data is self-reported at this time, the Ohio Board of Regents will use a newly formed database to periodically survey program graduates and monitor their employment.

The data from the COF campuses has progressively become more robust and meaningful. As we move quickly toward the fifth year of the program, and the first “official” graduating class of COF scholars, the Ohio Board of Regents will also be able to offer data on the degree attainment of graduates and the retention of COF scholars in the Ohio workforce. Feedback from the participating colleges and universities also indicated that collecting student GPAs was critical in highlighting the value of the program.

The Ohio Board of Regents is in a continuous improvement mode with COF to build on its success and enhance the scope and depth of its positive effects on Ohio’s economy and educated workforce in the future. For example, a recent award in petroleum engineering focuses on an opportunity to develop the potential of the natural gas reserves in southeastern Ohio. While petroleum



engineering was not a major or a program that showed a specific need for COF at the inception of the program, it was added as the opportunity for economic development emerged in Ohio. As the COF scholarships are available on more campuses and in more disciplines, increasing numbers of students will have the opportunity to apply for a COF award and pursue their academic and career goals in STEMM fields.

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