

## **Teachers for a Competitive Tomorrow Baccalaureate and Master's Degree Programs Report: 2008 - 2014**

Andrea Baird  
Federal Programs and Evaluation Officer  
U. S. Department of Education/Office of Postsecondary Education  
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The Teachers for a Competitive Tomorrow (TCT) Baccalaureate (TCT-B) program was first authorized in FY 2008 under the America COMPETES Act (ACA) of 2007 (Public Law 110-69, Title VI, Subtitle A, Part I), 20 USC 9813, to develop and implement programs, within a period of five years, to provide integrated courses of study in science, technology, engineering, mathematics (STEM), or critical foreign languages (CFL) subject areas that lead to a baccalaureate degree in these fields with concurrent teacher certification.

The America COMPETES Act, Public Law 110-69, 20 USC 9814, also authorized TCT master's degree grants (TCT-M), which were expected to develop and implement two- or three-year part-time master's degree programs in STEM or critical foreign language education for current teachers in order to enhance their content knowledge and pedagogical skills. In addition, the one-year (full-time) TCT-M program allowed grantees to develop programs for STEM or critical foreign language professionals that lead to a master's degree in teaching that results in teacher certification. This in-service graduate training was expected to improve preparation and retention of current STEM and critical foreign language educators in the nation's Kindergarten – Grade 12 (K-12) schools in high-need school districts (LEAs), and/or deliver programs for seasoned STEM or critical foreign language education professionals who were determined and qualified to become licensed teachers.

The eligible TCT applicants for the TCT-Baccalaureate (TCT-B) and Master's (TCT-M) Degree Programs were institutions of higher education (IHEs), on behalf of a department of a STEM or CFL area, or on behalf of a department or school with a competency-based degree program that includes teacher certification. A total of five TCT-B grants were funded from the competition held in 2008, awarded to the College of William and Mary, Mississippi State University (MSU), University of Delaware, University of North Carolina (UNC), and William Paterson University (WPU). The two five-year TCT-M grants awarded that year were to Lesley University (Lesley) and the University of Toledo (UT).<sup>1</sup>

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<sup>1</sup> Note: The five funded TCT-B grants and three TCT-M grants focused on mathematical and science content areas, and did not partner with departments/schools in their respective institutions of higher education that award degrees in foreign languages. Thus, all TCT-B/TCT-M higher education students have worked towards degrees in mathematics, science, and related fields along with concurrent teacher certification.

TCT grants, which were partnerships between colleges and universities and local education agencies (LEAs)<sup>2</sup>, emphasized the placement of TCT graduates in “high-need” LEAs (as defined by Public Law 110-69, Title VI, Subtitle A, Part I, Section 6112(3)), thereby increasing student access to highly qualified teachers, participation in upper-level STEM and CFL courses, and achievement in these disciplines that inspire and equip them for higher education and a productive future.

Only three years of funds were awarded to the TCT-B program – (approximately) \$1.092 million in each of FY 2008, 2009, and 2010. Neither the FY 2011 nor FY 2012 Department budgets appropriated funding for the TCT-B program, so that no additional funds were awarded to each of the five TCT-B grantees. However, TCT-B grants that were making substantial progress towards completing program goals and project objectives (and had sufficient funds in their accounts) were given permission to continue operating in 2011-2012 and 2012-2013. Two of the TCT-B grantees (MSU and WPU) operated for four years, from October 2008 through September 2012; and the remaining three entities successfully managed and evaluated their STEM education provisions for an additional year – for the statutorily allowable five years.<sup>3</sup>

Both of the 2008 TCT-M grants received all five years of funds in their first year of appropriation, when the first of two TCT-M grant competitions occurred.<sup>4</sup> These FY 2008 grants operated for their legislatively authorized five years. Their grant performance periods ended in September 2014, given no cost one-year extensions; and their final reports were submitted shortly afterward.

The TCT grant projects, taken collectively, have contributed significantly to teacher preparation and school placement (particularly in high-need schools) matters. Below is a brief assessment of five key TCT-B and TCT-M outcomes on various performance measures -- empirical evidence that the TCT-B recipients in particular maximized efficiency, and leveraged their assets and expertise, in order to attain their multi-year objectives.

The primary sources for this TCT Baccalaureate and Master’s Degree Programs Multi-Year Capstone Report (in addition to the TCT-B/TCT-M public law) are the grant recipients’ submitted Annual Programmatic/Financial Performance Reports, their comprehensive Final Performance Reports (submitted in December 2012 by MSU and WPU, December 2013 from the three IHEs that had the funds to operate their TCT-B programs for five project years, and December 2014 from the two 2008 TCT-M grant programs). Additional supplemental information is from TCT-B’s two-year external evaluation (conducted by The Study Group, Inc.) that assessed each grant project’s 2008-2010 academic characteristics of participants; mentoring, tutoring, research, and internship experiences; and overall data quality, sufficiency, and long-term evaluation capabilities (as an indicator of overall TCT program performance).<sup>5</sup>

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<sup>2</sup> TCT grantees’ partnerships could have (but were not required to) include a nonprofit organization that has a “demonstrated record of providing expertise or support to meet the purposes of the TCT Program.”

<sup>3</sup> Refer to the **Federal Funds Table**, which shows annual appropriations, from FY 2008 – FY 2010, for each of the five TCT-B grant recipients, as well as aggregate totals.

<sup>4</sup> Refer to the **Federal Funds Table**, which shows the 2008 total funds appropriated to each of the FY 2008 TCT-M grants.

<sup>5</sup> The Study Group, Inc. (Patricia Bourexis, TCT Program Task Order Director), Memorandum to Richard Lee, Contracting Officer’s Representative, “Assessment of TCT Program’s Overall Performance Based on Grantee Data,” September 29, 2011.

1. As shown in **Tables 1-A and 1-B** below, participation<sup>6</sup> of student beneficiaries in the U.S. Department of Education’s funded TCT programs has grown from 56 in 2008-2009 (Year 1) to 454 undergraduates in the STEM “career pipeline” by 2011-2012 (Year 4) – the final year in which all five original TCT-B grants were executing their programs. In Year 5, with three grants still functioning, there were 183 undergraduates pursuing degrees in STEM fields with concurrent teacher certification. With respect to TCT-M, for the six operating years of the two Federally-assisted institutions, 163 in-service teachers overall were credited for TCT graduate coursework and STEM-related services (and 47 during the sixth year - 2013-2014 - in particular).

**Table 1-A: TCT-B Program: Teacher Candidate Enrollment by Grant Recipient:  
Academic Years 2008-2009 through 2012-2013**

<b>TCT-B Grant Recipient</b>	<b>2008 - 2009</b>	<b>2009 - 2010</b>	<b>2010 - 2011</b>	<b>2011 - 2012</b>	<b>2012 - 2013</b>
<b>College of William and Mary</b>	8	24	26	40	11
<b>Mississippi State University</b>	10	18	23	16	*
<b>University of Delaware</b>	1	2	27	30	39
<b>University of North Carolina – Chapel Hill</b>	8	39	67	105	133
<b>William Paterson University</b>	29	207	271	263	*
<b>TOTAL</b>	56	290	414	454	183

\*Program did not operate.

**Table 1-B: TCT-M Program: Teacher Candidate Enrollment by Grant Recipient:  
Academic Years 2008-2009 through 2013-2014**

<b>TCT-M Grant Recipient</b>	<b>2008 - 2009</b>	<b>2009 - 2010</b>	<b>2009 - 2010</b>	<b>2011 - 2012</b>	<b>2012 - 2013</b>	<b>2013 - 2014</b>
<b>Lesley University</b>	39	66	68	80	54	27
<b>University of Toledo</b>	10	10	10	20	20	20
<b>TOTAL</b>	49	76	78	100	74	47

<sup>6</sup> TCT grants defined enrolled “TCT participants” primarily as STEM undergraduate majors seeking concurrent teacher certification; or current in-service STEM instructors pursuing M.S. degrees in the content area(s) in which they are currently teaching (to enhance their licensure credentials) – numbers reported annually to the U.S. Department of Education.

2. The total percentage of participants in the TCT undergraduate programs who were female has increased from 64 percent (at the onset of TCT-B in 2008) to 78 percent in Year 5. During each year of the grant, the percentage of program enrollees comprised of women was relatively consistent across grantees. This proportion was also greater than the 59 percent rate reported for STEM female undergraduate teaching candidates nationwide in 2013.<sup>7</sup> At the graduate level, approximately 66 percent of those pursuing master's and higher level degrees in the STEM education related fields in the nation's IHEs were female<sup>8</sup>; this compares to 80 percent of students enrolled in the TCT-M programs during the 2013-2014 fiscal year.
  
3. In addition to traditional faculty-led classroom instruction, the TCT-B undergraduates (and graduate students) engaged in meaningful hands-on research and/or laboratory experiences. By 2012-2013 (Year 5), for the TCT-B program, 47 percent of the undergraduate/preservice participants conducted an annual average of 198 hours of scientific research participation (including outdoor field experiments) and spent 98 hours working independently in laboratory settings.<sup>9</sup> At the master's degree level, all of the TCT-M students, each project year, had significant independent research and field experiences, fostered by faculty guides and local government financial support, in settings ranging from mathematics laboratories, to aquatic habitats, and to observational ecosystems.<sup>10</sup>
  
4. The TCT-B initiative, from October 2008 to September 2013, produced 160 program graduates with B.S. degrees in mathematics, science (e.g., biology, chemistry, geology/geosciences, and physics), and other applied areas with initial licensure to teach in the nation's K-12 schools. Likewise, from 2008 – 2014, TCT-M graduated with M.S. degrees 91 licensed teachers predominantly in mathematical and biological sciences (e.g., environmental studies focus). (**Tables 2-A** and **2-B** below illustrate the information on this education-related metric.)

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<sup>7</sup> Snyder, T.D., and Dillow, S.A (2015). Digest of Education Statistics 2013 (NCES 2015-011), National Center for Education Statistics, Institute of Education Science, U.S. Department of Education. Washington, D.C.; and <http://www.nsf.gov/statistics/2015/nsf15311/tables.cfm> and <http://www.nsf.gov/statistics/wmpd>.

<sup>8</sup> Snyder, T.D., and Dillow, S.A (2015). Digest of Education Statistics 2013 (NCES 2015-011), National Center for Education Statistics, Institute of Education Science, U.S. Department of Education. Washington, D.C.; and <http://www.nsf.gov/statistics/2015/nsf15311/tables.cfm> and <http://www.nsf.gov/statistics/wmpd>.

<sup>9</sup> See Public Law 110-69, Title VI, Subtitle A, Part I, Sec. 6113(b)(3) and 6113(d)(2)(A) – the statutory cites for this performance measure.

<sup>10</sup> See Public Law 110-69, Title VI, Subtitle A, Part I, Sec. 6114(c)(3) – the statutory cite for this performance measure.

**Table 2-A: TCT-B Program: Certified/Licensed Teacher Graduates by Grant Recipient:  
Academic Years 2008-2009 through 2012-2013  
(TCT Graduates|Projected Pipeline)**

<b>TCT-B Grant Recipient</b>	<b>2008 - 2009</b>	<b>2009 - 2010</b>	<b>2010 - 2011</b>	<b>2011 - 2012</b>	<b>2012 - 2013</b>	<b>Total Post 2013: Pipeline of Projected STEM Teachers</b>
<b>College of William and Mary</b>	0	1	1	3	0	5 9
<b>Mississippi State University</b>	0	1	3	3	*	7 160
<b>University of Delaware</b>	0	0	1	8	6	15 37
<b>University of North Carolina – Chapel Hill</b>	8	12	14	20	25	79 133
<b>William Paterson University</b>	2	12	20	20	*	54 110
<b>TOTAL</b>	10	26	39	54	31	160 449

\*Program did not operate.

**Table 2-B: TCT-M Program: Certified/Licensed Teacher Graduates by Grant Recipient:  
Academic Years 2008-2009 through 2013-2014  
(TCT Graduates|Projected Pipeline)**

<b>TCT-M Grant Recipient</b>	<b>2008 - 2009</b>	<b>2009 - 2010</b>	<b>2009 - 2010</b>	<b>2011 - 2012</b>	<b>2012 - 2013</b>	<b>2013 - 2014</b>	<b>Total Post 2014: Pipeline of Projected STEM Teachers</b>
<b>Lesley University</b>	0	9	0	17	18	20	64 69
<b>University of Toledo</b>	0	0	2	5	18	2	27 16
<b>TOTAL</b>	0	9	2	22	36	22	91 85

5. As shown in **Tables 3-A and 3-B** below: By TCT-B’s fifth/capstone year, the total number of program graduates employed as teachers (in the STEM field in which they are certified/licensed) in the country’s K-12 schools was ninety-seven (97), with 48 of them gainfully employed in partner or other schools designated as “high-need.” And within the six years of financial and in-kind supports, the two TCT-M recipients placed 90 STEM educators in elementary or secondary schools (with 66 of them categorized as “high-need”).

**Table 3-A: TCT-B Program: Certified/Licensed Teachers Placed in the Nation’s Schools  
By Recipient IHE: Academic Years 2008-2009 through 2012-2013  
(All Schools|High-Need LEA Placement)**

<b>TCT-B Grant Recipient</b>	<b>2008 - 2009</b>	<b>2009 - 2010</b>	<b>2010 - 2011</b>	<b>2011 - 2012</b>	<b>2012 - 2013</b>	<b>Total High- Need LEA Placement</b>
<b>College of William and Mary</b>	0 0	1 0	1 0	2 0	0 0	4 0
<b>Mississippi State University</b>	0	1 0	1 1	1 1	*	3 2
<b>University of Delaware</b>	0 0	0 0	1 1	7 2	5 4	13 7
<b>University of North Carolina – Chapel Hill</b>	6 5	8 6	5 4	16 9	13 8	48 32
<b>William Paterson University</b>	1 0	8 2	6 2	14 3	*	29 7
<b>TOTAL</b>	7 5	18 8	14 8	40 15	18 12	97 48

\*Program did not operate.

**Table 3-B: TCT-B Program: Certified/Licensed Teachers Placed in the Nation’s Schools  
By Recipient IHE: Academic Years 2008-2009 through 2013-2014  
(All Schools|High-Need LEA Placement)**

<b>TCT-M Grant Recipient</b>	<b>2008 - 2009</b>	<b>2009 - 2010</b>	<b>2009 - 2010</b>	<b>2011 - 2012</b>	<b>2012 - 2013</b>	<b>2013 - 2014</b>	<b>Total High-Need LEA Placement</b>
<b>Lesley University</b>	0	9 7	0	17 5	18 18	19 17	63 47
<b>University of Toledo</b>	0	0	2 2	5 5	18 10	2 2	27 19
<b>TOTAL</b>	0	9 7	2 2	22 10	36 28	21 19	90 66

These five education attainment measures discussed in this report are summarized at the national level visually for both TCT-B and TCT-M in the “**TCT-B/TCT-M National Summary Table**,” and shown in the accompanying graphical display/progression of these primary education indicators below, as well.

The seven grantees of the TCT-B and TCT-M programs’ 2008 cohorts have overcome funding constraints, and by means of careful management and financial and in-kind contributions, have obtained significant outcomes. For TCT-B, five grantees received \$3.17 million, established a program, and produced (and placed) 97 highly qualified educators – at a cost of approximately \$6,500 per teacher per year.

And, the above numbers underreport the program's impact: there are still teacher candidates "in the pipeline" as the 2008 grant period ends. UNC-Chapel Hill, for example, has 133 remaining STEM undergraduates in its program, and fully expects to graduate and place them in classrooms. In the TCT-M program, Lesley University has two cohorts (totaling 69 students) en route to obtaining M.S. degrees.<sup>11</sup>) Thus, due to Department of Education appropriations and supplementary match support, the nation can expect to benefit in forthcoming years from an additional 535 educators (with TCT-funded baccalaureate or master's degrees) in the science, technology, engineering, and mathematics related disciplines who have completed essential licensing examinations and meet the other requirements to teach in their areas of certification. (See **Tables 2-A** and **2-B.**)

In summary: Since their launching in 2008, the Teachers for a Competitive Tomorrow (TCT) undergraduate and graduate degree programs have addressed and have aimed to the close the aforementioned gaps, especially in schools that have a shortage/dearth of certified teachers in these broad science, mathematics, and related technical content areas. The enabling legislation for the TCT-B and TCT-M programs leaves a legacy of substantial contributions and enduring impact: preservice and in-service teachers for the nation's classrooms (who began their careers as 454 TCT-B and 163 TCT-M participants in total); as well as seasoned STEM professionals, having previously completed undergraduate or graduate preparation in their respective fields (and experiencing various work settings), now ready (having earned certification/licensure) to enter teaching in high-need and other schools, as part of the multiple successive classes of 91 TCT-M program graduates; and educator preparation programs (who train IHE students to serve diverse K-12 learners performing at various academic levels) energized and institutionalized at various IHEs. Most significantly, thousands of students have been, and will continue to be reached by these motivated teachers, introduced to STEM concepts and skills, and moved toward marketable STEM careers and responsible participation in citizenship.

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<sup>11</sup> See Public Law 110-69, Title VI, Subtitle A, Part I, Secs. 6114(b)(8) and(9), and (c)(9) – the statutory cites for this performance measure.

**TEACHERS FOR A COMPETITIVE TOMORROW PROGRAMS  
FY 2008 BACCALAUREATE AND MASTER'S DEGREE GRANT RECIPIENTS  
ANNUAL APPROPRIATIONS**

**Five FY 2008 TCT-B Grant Recipients and Two TCT-M Grant Recipients**

**Federal Funds Table**

<b>PR Number</b>	<b>TCT-B Grant Recipient</b>	<b>State</b>	<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>Total</b>
P381A080001	University of Delaware	DE	\$100,238	\$194,783	\$179,859	\$ 474,880
P381A080006	William Paterson University	NJ	\$198,347	\$205,555	\$213,993	\$ 617,895
P381A080009	The College of William and Mary	VA	\$187,849	\$236,577	\$248,148	\$ 672,574
P381A080011	Mississippi State University	MS	\$241,433	\$214,122	\$250,000	\$704,555
P381A080014	University of North Carolina - Chapel Hill	NC	\$249,963	\$249,963	\$200,000	\$699,926
<b>TOTAL</b>			<b>\$977,830</b>	<b>\$1,100,000</b>	<b>\$1,092,000</b>	<b>\$ 3,169,830</b>

<b>PR Number</b>	<b>TCT-M Grant Recipient</b>	<b>State</b>	<b>FY 2008</b>			<b>Total</b>
P381B080002	Lesley University	MA	\$1,042,000	N/A	N/A	\$1,042,000
P381B080006	University of Toledo	OH	\$937,261	N/A	N/A	\$937,261
<b>TOTAL</b>			<b>\$1,979,261</b>	N/A	N/A	<b>\$1,979,261</b>

**Note:** Both TCT-M grant recipients received the entire appropriation of Federal project funds in FY 2008 (Year 1). Therefore, no continuation awards of funds were obligated to the two FY 2008 TCT-M grants in successive years.

**Teachers for a Competitive Tomorrow Programs:  
Outcomes of Key Performance Measures: 2008-2014**

**TCT-B/TCT-M National Summary Table**

<b>Program Measure</b>	<b>TCT-B</b>	<b>TCT-M</b>
<b>Measure 1</b>	454 Preservice Participants	163 In-service Participants
<b>Measure 2</b>	78 Percent Female	80 Percent Female
<b>Measure 3</b>	47 Percent Engaged in Research & Laboratory Experiments	100 Percent Engaged in Research & Laboratory Experiments
<b>Measure 4</b>	160 B.S. Graduates (in science and mathematical fields) with Concurrent Initial Certifications to Teach	91 M.S. Graduates (in biological and mathematical sciences) with Professional Teachers License
<b>Measure 5</b>	97 Certified STEM Teachers (48 in High-Need Schools)	90 Certified STEM Teachers (66 in High-Need Schools)
<b>Pipeline of STEM Teachers</b>	449 TCT-B Students en route to Program Graduation	85 TCT-M Students en route to Program Graduation

Teachers for a Competitive Tomorrow Programs:  
Outcomes of Key Performance Measures: 2008-2014

