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The Joint Council on Thoracic Surgery Education (JCTSE) "Educate the Educators" Faculty Development Course: Analysis of the First 5 Years

Stephen C. Yang, MD, Ara A. Vaporciyan, MD, Rebecca J. Mark, MA, MBA, Deborah A. DaRosa, PhD, Frank T. Stritter, PhD, Maura E. Sullivan, MSN, PhD, and Edward D. Verrier, MD

Division of Thoracic Surgery, Department of Surgery, The Johns Hopkins Medical Institutions, Baltimore, Maryland; Division of Surgery, Department of Thoracic and Cardiovascular Surgery, The University of Texas MD Anderson Cancer Center, Houston, Texas; The Joint Council on Thoracic Surgery Education, Inc, Chicago, Illinois; Department of Surgery, Northwestern University Feinberg School of Medicine, Chicago, Illinois; Office of Educational Development, School of Education, University of North Carolina, Chapel Hill, North Carolina; Department of Surgery, University of Southern California, Los Angeles, California; and Division of Cardiothoracic Surgery, Department of Surgery, University of Washington, Seattle, Washington

Background. **Since 2010, the Joint Council on Thoracic Surgery Education, Inc (JCTSE) has sponsored an annual "Educate the Educators" (EtE) course. The goal is to provide United States academic cardiothoracic surgeons (CTS) the fundamentals of teaching skills, educational curriculum development, and using education for academic advancement. This report describes the course development and evaluation along with attendee's self-assessment of skills through the first 5 years of the program.**

Methods. **The content of this $2^1/_2$ -day course was based on needs assessment surveys of CTS and residents attending annual meetings in 2009. From 2010 to 2014, EtE was offered to all CTS at training programs approved by the Accreditation Council for Graduate Medical Education. Course content was evaluated by using end-of-course evaluation forms. A 5-point Likert scale (1 = poor, 5 = excellent) was used to obtain composite assessment mean scores for the 5 years on course variables, session presentations, and self-assessments.**

Results. **With 963 known academic CTS in the United States, 156 (16.3%) have attended, representing 70 of 72 training programs (97%), and 1 international surgeon attended. There were also 7 program coordinators. Ratings of core course contents ranged from 4.4 to 4.8, accompanied with highly complementary comments. Through self-assessment, skills and knowledge in all content areas statistically improved significantly. The effect of the course was evaluated with a follow-up survey in which responders rated the program 4.3 on the usefulness of the information for their career and 3.9 for educational productivity.**

Conclusions. **The EtE program offers an excellent opportunity for academic CTS to enhance their teaching skills, develop educational activities, and prepare for academic promotion. With its unique networking and mentorship environment, the EtE program is an important resource in the evolution of cardiothoracic surgical training in the United States.**

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With an ever-changing surgical curriculum, training paradigms, adult learning practices, advances in technologies, and clinical time pressures, a focused course designed especially for cardiothoracic (CT) surgeons (CTS) involved with the education of faculty, residents, and students is an appropriate mandate. This endeavor was done with the hope of generating an "army of educators" who will lead the new wave of education for the next generation of CTS.

This first education effort in faculty development for CTS was modeled on the successful American College of Surgeons "Surgeons as Educators" (SAE) course, which now is in its 23rd year of existence. That course, using a combination of didactic and interactive teaching sessions, is given over 6 days, and constantly in high demand. One of the objectives after the creation of the Joint Council on Thoracic Surgery Education, Inc (JCTSE) in 2008 was to focus on faculty development. It was proposed to present a modified version of the SAE course, the "Educate the Educators" (EtE) course, due to the limited time commitment of CTS. This report describes the needs assessment used in the course

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Address correspondence to Dr Yang, Division of Thoracic Surgery, Department of Surgery, The Johns Hopkins Medical Institutions, 600 N Wolfe St, Blalock 240, Baltimore, MD 21287; email: syang@jhmi.edu.

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Table 1. Goals of the "Educate the Educators" Program

- Improve the teaching skills of cardiothoracic surgeons
- Practice and receive feedback
- Provide a framework to develop a skills lab or educational curriculum for implementation at the home institution
- Understand how to convert educational efforts into career advancement

development, attendees' course evaluation, and their self-assessment of skills development through the first 5 years of the program.

Material and Methods

The goal of EtE is to engage every CT surgical residency program in the United States (U.S.). The content of this $2^1/_2$ -day course was based on several needs assessment surveys of CTS and residents attending The Society of Thoracic Surgeons (STS), the Thoracic Surgery Directors Association (TSDA), and the Thoracic Surgery Residents Association (TSRA) meetings in 2009. The SAE course was used as a framework for EtE. A list of 25 pertinent topics from the prior year's SAE meeting was organized into four main categories: curriculum development, evaluation/assessment, education administration and management, and teaching skills. Faculty and residents surveyed were asked to assign a score based on an anchored 5-point Likert scale (1 = not necessary, 5 = required) to each of these topics [1]. Once the more popular topics were selected, the overall EtE course schedule was organized.

From 2010 to 2014, EtE was offered to all CTS at training programs approved by the Accreditation Council for Graduate Medical Education (ACGME). The goals of the EtE course are outlined in Table 1. The quality of course content, presentations, and meeting logistics were evaluated by using end-of-course on-line evaluation forms, using a 5-point Likert scale (1 = poor, 5 = excellent). An external reviewer (F.T.S.) provided an annual debriefing feedback critique. Annual course modifications were implemented after these summative and formative evaluations. Continuing medical education credits were offered beginning in 2013. Statistical analysis of the self-assessments before and after the course was done using the paired *t* test on the Stata 12 software (StataCorp LP, College Station, TX) with significance defined as a *p* value of 0.05 or less.

Results

Course Design and Development

A total of 209 responses were obtained from the STS, TSDA, and TSRA meetings in 2009. The results from this

Table 2. Needs Assessment Survey Results (n = 81) for the "Educate the Educators" Program

Topic	Title	Average Score[a]
Curriculum development	Curriculum Development and Planning	4.3[b]
	Instructional Materials and Methods	4.1
	Program and Faculty Evaluation	4.1
	Use of Technology in Education	3.8
	Writing Goals and Objectives	3.7
	Needs Assessment	3.5
Evaluation and assessment	Surgical/Technical Skills in Teaching and Assessment	4.5[b]
	Performance Ratings	4.1
	Testing and Measurement	4.1
	Due Process and the Failing Student	4.0
	The ACGME Competencies	3.2
Education administration and management	Education for Career Promotion and Goal Development	4.5[b]
	Motivating Faculty to be Effective	4
	Implementing Change	3.8
	Management of Time and Priorities	3.7
	Leadership Competencies	3.6
	Conflict Management	3.6
	Resident Selection and Interviewing	3.0
Teaching skills	Teaching in the Operating Room	4.8[b]
	Teaching Technical Skills	4.6[b]
	Feedback Skills	4.1[b]
	Principles of Adult Learning: How People Learn	3.9[b]
	Questioning Skills	3.8
	Teaching in the Clinic/Office	3.5
	Formal Presentations and Lectures	3.2

[a] Scoring was based on a 5-point Likert score: 1 = not needed, 5 = essential. [b] Topics chosen for course.

ACGME = Accreditation Council for Graduate Medical Education.

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Table 3. "Educate the Educators" Daily Course Schedule

Day 1	Evening: registration and welcome
Day 2	Introduction of Attendees and Course Overview
	How People Learn
	Curriculum Design
	Formative Feedback
	Teaching in the Operating Room
	Evaluation of the Day and Feedback
Day 3	Teaching Psychomotor Skills
	Skills Assessment
	Workshop (topics decided annually)
	Evaluation of the Day and Feedback
Day 4	Converting Education Effort Into Promotional Currency
	Cashing-in on Your Education Portfolio
	Wrap-up/Open Discussion/Course Evaluations

needs assessment are reported in Table 2. Because the program design was to be shorter than the American College of Surgeons SAE week-long course, only the top subjects were picked (Table 3), yet having flexibility for breakout sessions and invited lectures.

Implementation

One of the main objectives for faculty development was to contact every ACGME-approved training program. Since inception, EtE is offered to all CTS at ACGME-approved training programs. Notifications were done through constant emails to program directors and co-ordinators and announcements at the annual TSDA meetings. In recent years, personal phone calls were made to program directors and chairs representing those who have not attended in the past. With all these efforts

Table 4. Institutions Represented by Surgeons at the "Educate the Educators" Courses 2010 to 14[a]

Albany Medical College (2)	Texas Heart Institute/Baylor College of Medicine (3)
Allegheny General Hospital (3)	The Methodist Hospital
Beth Israel Deaconess Medical Center (3)	Tufts Medical Center
Boston University	University of Alabama at Birmingham
Brigham and Women's Hospital (4)	University of Arizona
Catholic University School of Medicine, Santiago, Chile	University of California, Davis Medical Center
Cedars-Sinai Medical Center (2)	University of California, Los Angeles (2)
Children's Hospital/University of Nebraska	University of California, San Francisco (2)
Children's Hospital of Philadelphia	University of Chicago (2)
Cleveland Clinic Foundation (2)	University of Cincinnati
Duke University Medical Center (4)	University of Colorado (4)
East Carolina University	University of Iowa Hospitals (3)
Indiana University School of Medicine (3)	University of Kentucky (3)
Johns Hopkins Medical Institutions (2)	University of Louisville (3)
Loma Linda University	University of Maryland
Long Island Jewish (2)	University of Miami
Loyola University Medical Center (2)	University of Michigan (4)
Massachusetts General Hospital (3)	University of Minnesota (3)
Mayo Clinic (2)	University of Mississippi (2)
Medical College of Wisconsin	University of North Carolina (2)
Medical University of South Carolina	University of Oklahoma (3)
Memorial Sloan Kettering Cancer Center (3)	University of Pennsylvania (3)
Montefiore Medical Center (3)	University of Pittsburgh (6)
Mount Sinai Medical Center (2)	University of Rochester
New York Presbyterian Hospital (3)	University of Southern California (3)
New York University Medical Center	University of Texas Health Science Center at San Antonio (5)
North Shore University Hospital	University of Texas MD Anderson Cancer Center
Northwestern University	University of Texas Southwestern Medical Center (2)
Ohio State University Hospital (3)	University of Utah (2)
Oregon Health & Science University (3)	University of Virginia (3)
Pennsylvania State University	University of Washington (4)
Rush University Medical Center (2)	University of Wisconsin School of Medicine (4)
St. Christopher's Hospital for Children	Vanderbilt University Medical Center
St. Louis University (2)	Virginia Commonwealth University Health System (2)
Stanford University	Washington University School of Medicine (4)
Swedish Heart & Vascular Institute	Yale-New Haven Medical Center (2)

[a] The number in parenthesis indicates more than 1 attended, n = 70. In 2015, an additional institutional representative from the University of Florida was included, but the data were not included in the analysis. One participant has since died. Prior participants have moved to institutions previously not represented (University of Kansas, Emory University).

Table 5. Seven Institutions Represented by Program Coordinators at the "Educate the Educators" Courses 2013 to 2014

- Duke University Medical Center
- Loyola University Medical Center
- Oregon Health & Science University
- University of Colorado
- University of Southern California
- University of Wisconsin (attended twice)

through the first 5 years, 70 of 72 certified training programs (Table 4) have sent 1 or more surgical faculty to this course, one new program was represented in 2015, and 7 program coordinators have attended (1 attended twice, Table 5). Several institutions have been represented on multiple occasions. Although some institutions still have not had formal representation at EtE, 5 institutions have recruited past attendees who currently have active educational roles in their organization.

Course Evaluation and Review

The class size of CTS varied annually. Of the 157 surgeons, 49 (31%) identified themselves as strictly cardiac, 66 (42%) strictly general thoracic, 10 (7%) strictly pediatric cardiac, 19 (12%) both cardiac and thoracic, and the remaining 13 (8%) a mixture of the above specialties. One international surgeon attended. CTS leadership was also represented, with 32 program directors and 10 divisional chiefs/department chairs attending the course. Program coordinators were invited to attend in 2013, and this analysis includes 7 coordinators, 1 of whom attended twice.

The composite mean evaluation data from the core presented topics and those not presented annually from 2010 to 2014 are listed in Table 6. Specifically, topics on developing an educator's portfolio, using educational activity for promotion, and understanding adult learning principles consistently receive the highest ratings (4.6). Workshops focusing on milestones implementation, educational leadership/change, and eLearning concepts received the highest ratings (5.0, 4.8, and 4.5 respectively).

Table 6. Attendance and Composite Evaluation Scores of "Educate the Educators" Topics and Workshops From 2010 to 2014

Variables	2010	2011	2012	2013	2014	Total
Attendance						
Surgeons, No.	40	37	37	18/4	25/4	157
Program coordinators, No.				4	4	8[a]
	Likert Scores[b]					Average
Sessions taught each year						
Assessment of Surgical Skills	4.5	4.4	4.5	4.6	4.4	4.5
Cashing-in on Your Educational Portfolio	4.4	4.6	4.8	4.8	4.7	4.6
Converting Educational Effort Into Promotional Currency	4.4	4.6	4.7	4.8	4.5	4.6
Curriculum Design	4.6	4.2	4.6	4.5	4.5	4.5
Formative Feedback	4.4	4.5	4.6	4.7	4.5	4.5
How People Learn	4.7	4.6	4.4	4.8	4.5	4.6
Teaching in the Operating Room	4.2	4.5	4.5	4.6	4.5	4.4
Teaching Psychomotor Skills	4.5	4.4	4.5	4.6	4.5	4.5
Sessions not taught each year	2010	2011	2012	2013	2014	Ave
Implementing Change/Motivating the Educators	2.7	N/A	N/A	N/A	N/A	N/A
Multimedia Design	3.9	3.9	N/A	N/A	N/A	N/A
Education Is ALL About Leadership	N/A	4.8	N/A	N/A	N/A	N/A
The Need for Educational Change	N/A	4.8	N/A	N/A	N/A	N/A
Dealing With the Difficult Resident	N/A	3.9	4.3	N/A	4.4	4.2
Review eLearning Concepts	N/A	4.5	4.4	N/A	N/A	4.5
Techniques in Teaching Today's Learner	N/A	N/A	4.5	N/A	N/A	N/A
Workshops						
Simulation Lab Development and Implementation	N/A	N/A	N/A	4.1	N/A	N/A
Implementing the Milestones and the New Online Curriculum at Your Institution	N/A	N/A	N/A	5	N/A	N/A
Optimizing the Role of the Program Coordinator: Enhancing Evaluations to Managing Milestones	N/A	N/A	N/A	N/A	4.4	N/A
Implementing the TSC Curriculum at Your Institution	N/A	N/A	N/A	N/A	4.3	N/A
Mock Clinical Competency Committee (CCC)	N/A	N/A	N/A	N/A	4.4	N/A

[a] Program coordinators were invited beginning in 2013, and 1 coordinator attended twice. [b] Scores were based on a 5-point Likert scale 1 = poor, 5 = excellent.

JCTSE = Joint Council on Thoracic Surgery Education, Inc; N/A = not applicable; TSC = (joint JCTSE/TSDA) Thoracic Surgical Curriculum; TSDA = Thoracic Surgery Directors Association.

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Table 7. Composite Self-Assessment Averages of Skills Ability Before and After the "Educate the Educators" Course From 2010 to 2014 in 141 Participants[a]

Skill	Pretest Mean (SD)	Posttest Mean (SD)	*p* Value (two-tailed)
Designing a Curriculum	2.1 (0.83)	3.6 (0.51)	<0.001
Teaching in the Operating Room	3.3 (0.85)	4.1 (0.58)	<0.001
Designing a Multimedia Lecture	3.4 (0.87)	3.9 (0.56)	0.001
Designing a Teaching Session	3.1 (0.87)	3.9 (0.53)	<0.001
Providing Constructive Feedback	2.9 (0.90)	4.1 (0.42)	<0.001
Teaching Psychomotor Skills	3.2 (0.88)	4.1 (0.46)	<0.001
Implementing Change in Your Setting	2.8 (0.78)	3.5 (0.87)	<0.001
Leading a Team	3.2 (0.72)	3.8 (0.61)	0.001
Creating Educational Activity into Promotional Currency	2.5 (0.29)	4.2 (0.40)	0.005
Creating an Educator's Portfolio	2.5 (0.29)	4.0 (0.25)	<0.001

[a] Scores based on a 5-point Likert scale: 1 = poor, 5 = excellent.

At the end of each program annually, the faculty would immediately debrief about the positives and negatives of the course. An independent faculty development specialist (F.T.S.), with nearly 40 years of medical education experience, would provide a detailed written report; together with the postcourse survey evaluations, modifications in the course would occur for the subsequent year. This feedback process influenced the move to the current Chicago location, the addition/removal of core lecture topics, and having breakout workshops with specific topics important for that current year (eg, Milestones introduction, implementation of the new Thoracic Surgery Curriculum, starting the Clinical Competency Committee).

Learner Outcomes

Through self-assessment, the learners felt that skills and knowledge in all content areas improved with statistical significance, mostly with these same three topics. Results of the self-assessment are reported in Table 7, outlining the ratings before and after the encounter. All content areas significantly improved after the course. Perhaps the greatest areas of improvement were related to providing better feedback, using education as a vehicle for academic promotion, and developing one's educator's portfolio.

The effect of the course was evaluated with a follow-up survey in 2015. Graduates were asked elements on how the program affected their educational career, academic productivity, and promotion on a similar 5-point Likert scale. Of the 157 CTS, 44 (28%) returned the completed survey. They rated the program an average of 4.3 on the usefulness of the information for their career and 3.9 for educational productivity. EtE was used to revise/improve their residency program (27 [61.4%]), build a new training program or curriculum (20 [45.5%]), pursue educational research/publications (18 [40.9%]), and get an academic promotion (17 [38.6%]).

Comment

The debate remains whether great teachers are born or made. Numerous strategies have been implemented during the last several decades to improve teaching, influenced by the prevailing theories of learning, instructional design, and leadership development. Over time, teaching has been associated with a skill that is associated with, but separated from, content expertise [2]. The American College of Surgeons saw the gap and the need for specialized education and developed the SAE course in 1993 [3]. The 6-day SAE remains an extremely popular course, so much so that availability remains a challenge.

The JCTSE was conceived in 2008 with a mission to identify, introduce, and support innovative educational techniques, while improving faculty teaching expertise as the educational paradigm evolves [4]. The development of surgical faculty to teach better was one of the top priorities. The concept was to present a course similar to the SAE, but shorter, to fit the needs of the busy residency program directors and clinical CTS who generally have the predominant teaching responsibilities. It was also felt that a dedicated "immersion" program would enhance teaching and networking among similar educators. An intention of EtE is to engage every CT surgical residency program in the U.S. Through constant national announcements, emails to program directors and coordinators, and personal contacts, we were able to get 70 of the 72 ACGME-approved programs (94%) to send a representative during the first 5 years of EtE, with 1 additional program represented in 2015.

During the first 4 years, the $2^1/_2$ -day course was held on the campus of the University of North Carolina with the TSDA Boot Camp generally midsummer to coincide with the start of the new CT residents and fellows. The decision during the initial discussion was that this program should be held separate from any other national meetings and that an "immersion" program would allow total concentration on the topics; the venue might be augmented and synergistic with the TSDA Boot Camp. Having the faculty of the EtE and the Boot Camp, as well as the CT resident trainees, would provide several unique observational, teaching, and networking opportunities. In 2014 the course was moved to Chicago for several reasons because of feedback from the attendees. Scheduling

difficulties for faculty and attendees, due to conflicts during the summer months, resulted in last minute cancellations. Although the facilities at the University of North Carolina were ideal, the attendees asked for a more centralized national location and one convenient to an airport; hence, a site transfer to Chicago. Finally, there became increasing distractors between the faculty of the Boot Camp and EtE, causing a slight distraction in effective and focused teaching by the Boot Camp faculty.

Key to the course was the ability to develop and implement a curriculum. EtE essentially was a new curriculum, and presented here are the essential components of curriculum development, including design, development, implementation, evaluation, and review [5]. This course also embodied the seven principles of adult learning [6]:

- Instruction was problem centered.
- Case or problem solving was experience oriented.
- The learning environment was supported by enthusiastic faculty with respect for learners.
- Positive and negative feedback was given to the learners.
- Active teaching (simulation, small group discussion, brainstorming) was interspersed through the course.
- Prior experiences were presented and built upon.
- Adequate preparation and groundwork was given for each section.

Surgical education, training, and teaching paradigms have evolved significantly during the past 10 years, but change also brings on challenges. Four different pathways to thoracic surgical board certification now exist, the volume of knowledge and operative technologies have been greatly augmented, the learner uses traditional and electronic means of gathering information, and restricted residency work hours and a shift toward outpatient operations lessens the experience with direct patient contact. All of these issues require current-day educators to develop innovative techniques for more efficient transfer of information and skills to produce a competent surgeon. As such, a faculty development course, such as EtE and SAE and other similar institutional and national society programs, are key to the educational vitality of those who oversee residents and students. Other than the SAE report by DaRosa and colleagues [3] in 1966, no other similar reports have been published on faculty development programs established for surgical or medical subspecialties.

How best to measure the long-term effectiveness from graduates of this course is unclear. From our first survey measuring longitudinal progress, a number of new initiatives have already been created at the institutional level, including developing simulation laboratories, new curricular formats to address the educational needs, and reestablishment of a previously deactivated training program. A new research group focused on education has been created from alumni of this course, called the Thoracic Education Cooperative Group (TECoG). Future endeavors to measure course effectiveness include further follow-up surveys, progression of career advancement, and educational research and study activities.

This report has several limitations. Perhaps the data were biased because those who attended already had an interest in surgical education. The surveyed population for the needs assessment to develop EtE and the number of attendees represent only a small fraction of the total teaching workforce of academic CTS. Returns from the follow-up survey were low.

In summary, the EtE program offers an excellent opportunity for academic CTS to enhance their teaching skills, develop educational activities, and provide avenues for academic promotion. It also provides a unique environment for networking and mentorship and is an important resource in the evolution of CT surgical training in the U.S.; it is the hope to continue this as an annual course and perhaps to expand globally as an initiative for the globalization of thoracic surgical education. Effectiveness in changing the landscape of CT surgical training is hard to objectively measure, but those who have provided feedback have felt that EtE was very useful as a catalyst for their own educational careers.

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