Texas Higher Education Coordinating Board and Lumina Foundation for Education

Minutes
Tuning Oversight Council for Engineering and Science
June 24, 2011
10:00 a.m. to 3:00 p.m.

Wyndham Garden Hotel and Conference Center
Executive Learning Center
Austin, Texas

Members Attending: Lava Banjara (student), Lennine Bashiri, Maria Benavides, Leonidas Bleris, Stacie Brown, Jerrod Butcher, Ting Chen, John Chisholm, Charles Chuong, Charlene Cole, John Criscione, Linda Crow, Keith Freedman (for Michael Poehl), Harvinder Gill, Michael Gyamerah, Jonda Halcomb, James Holste, Catherine Howard, Lee Hughes, Arif Karim, Genaro Lopez, Andrew Mark (student), Prakesh Nair, James Nelson, Scott Nunez, Joo Ong, Austin Osmanski (student), Patrice Parsons, Lynda Peebles, Steve Rathbone, Peyton Richmond, Marisela Rodriguez, Connie Russell, Steven Salvato, Chandeshwar Sharma, Joe Studer, James Tunnell, Mark Vaughn, Amy Vickers, Chris Wild, Darren Williams, Bobby Wilson, James Zech

Facilitators and other Attendees: Reinold Cornelius, Gary Hanson, Duane Hiller, Kevin Lemoine, David Marshall, Suzanne Pickens, Debbie Rodriguez, Sarah Rondinelli, Mary Smith, Melinda Valdez-Ellis

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Registration was held and a Continental Breakfast served between 9:00 and 9:30 a.m.

The meeting convened at 9:30 a.m.

Welcome, General Comments, and Timeline

Dr. Mary Smith, Assistant Deputy Commissioner for Academic Planning and Policy at the Texas Higher Education Coordinating Board, opened the meeting. She thanked Council members for the work done to date, noting virtual meetings of the Council's respective committees have held since February. She mentioned that this Council is now a part of the Texas Team due to their involvement in the Tuning project. Dr. Smith pointed out that the focus of the Council and each committee is to facilitate transfer and assist students in meeting their goals of attaining higher education. She asked that members contact staff at the Coordinating Board if there is anything needed to facilitate their work.

Dr. Smith drew attention to the agenda for the day. She also asked that members complete the evaluations of the meeting to provide feedback on the value of the meetings to their work.

Council Chair, Dr. James Nelson, and Co-chair, Dr. Linda Crow, greeted members of the Council. Dr. Nelson asked for and received a motion to approve the minutes with one change. The motion was seconded and minutes were unanimously approved. Dr. Crow welcomed the Council back and thanked them for their work to date via LiveMeeting.

Dr. Nelson then outlined the activities for the day. In discussing the upcoming presentation by Dr. James Goeman of the Coordinating Board, Dr. Nelson emphasized the importance of the Academic Course Guide Manual (ACGM) to both community colleges and to universities in ensuring quality and alignment of instruction for transfer students. He pointed out that student learning outcomes are being included in the ACGM for courses, and that one purpose of this Council will be to "fine-tune" courses that are relevant to the degrees and determine these outcomes. He reminded Council members that these outcomes do not interfere with academic freedom, as they only mandate the "what" in the courses, not the "how".

Dr. Crow reiterated the importance of the course outcomes. She recommended that Council members let go of any fears that their courses will be micromanaged and embrace the learning outcomes as a way to ensure consistency of instruction and preparation statewide. These outcomes should not be seen as limiting factors.

Status of Committees' Work

Chair Nelson then requested an update on each committee. Dr. Lee Hughes, of the University of North Texas, stated that the Tuning Committee for Biology has been meeting virtually each month since the first meeting in Austin. Goals have been to get members through the Institutional Review Board (IRB) process, and student surveys have begun. Employer surveys went out last week. The committee has identified 11 outcome areas for Biology, and they will move forward with those when meeting today.

Dr. John Criscione, of Texas A&M University, reported that the Tuning Committee for Biomedical Engineering began by determining employers of biomedical engineers. Committee members then interviewed people in those industries to find out what outcomes were expected and required of biomedical engineering graduates. This meeting will be spent trying to determine at what level these outcomes should be achieved.

Steve Rathbone, of Blinn College and co-chair of the Tuning Committee for Chemical Engineering, reported in the chair's absence. He stated that the committee has met virtually now that some technology issues have been resolved. Preliminary work has been done on the outcomes, and the committee will be guided by the finished work of the Tuning Committee for Mechanical Engineering. Details on the outcomes and direction will be the focus of this meeting.

Dr. Darren Williams, of Sam Houston State University, reported that the Tuning Committee for Chemistry has also been meeting virtually each month and has had very productive meetings. The committee has written paragraphs on the learning outcomes they have determined. He felt that the idea of going directly to the employers was a good one, and stated that the committee may use this method, too, to verify what they have done. Four of nine schools represented on the committee have completed the IRB process, and some student surveys have been distributed.

Implications and Discussion of the Texas Common Course Numbering System and Academic Course Guide Manual (ACGM)

Chair Nelson introduced Dr. James Goeman, Assistant Director of Academic Programs at the Texas Higher Education Coordinating Board, to present to the Council summary information on the Academic Course Guide Manual (ACGM).

Dr. Goeman defined the ACGM as "a list of courses that community colleges, technical colleges, and state colleges can freely offer at any time and receive state reimbursement when they teach it." This is markedly different from universities, which develop their own course inventories and simply report that to the Coordinating Board each year. Community colleges are not so empowered and are limited to offering

what is in the ACGM. The only option outside the ACGM that community colleges have is to request a "Unique Needs" course, a special course that a particular institution receives permission from the Coordinating Board to teach and be funded by the state in order to respond to community needs. The reason for this differentiation is the difference between the missions of the two types of institutions. Universities are charged with offering baccalaureate degrees and must be able to provide everything that goes into this at both the upper- and lower-division levels. Community colleges are charged with many different missions, one of which is that of an academic transfer institution: to provide students with academic coursework at the lower division that prepares them for baccalaureate work at a four-year institution.

The introduction to the ACGM will give the reader a good idea of what is in the manual and how it operates. Dr. Goeman displayed an example of a course and explained what information is included. Each course has a four-letter rubric and a four-digit number which are taken from the Texas Common Course Numbering System. Universities are not required to follow this course numbering system, but they are required to provide a parenthetical listing of this number in the course catalog when listing an equivalent course.

Along with the identifying information on the course, the ACGM lists a course description outlining what is taught in the course. From this description, instruction can "add to, but not delete" topics being covered. The information provided includes a listing of prerequisites or co-requisites and course parameters. The CIP code indicates in which discipline area the course resides as classified in the Classification of Instructional Programs, which is a federal taxonomy for describing collegiate programs. The last two digits are funding codes which define the level of funding for which the course qualifies, and finally shows the maximum number of credit hours allowable per student and per course. It also shows the maximum contact hours per course, as contact hours are the method of funding community colleges whereas credit hours are the method of funding universities.

Dr. Goeman pointed out that all course listings in the ACGM will eventually be modified to include learning outcomes and that part of this Council's and its respective committees' work will be to define these for discipline-relevant courses. The learning outcomes define exactly what students will know, understand, and be able to do by taking the course, providing a much higher level of specificity in determining what students have learned in the course. Historically, there has been disagreement between universities and community colleges regarding the level and quality of instruction being provided to students. This has resulted in students being required to retake courses upon transfer to universities. This is a problem for the state in terms of reimbursement for two courses with the same title, and for the student to pay to take the course twice. To address this, the inclusion of learning outcomes is intended to facilitate transfer of courses among institutions. By defining exactly which key outcomes are needed from the course, universities can rest assured that students transferring into their programs have the knowledge and skills they need for the next level.

The process of course inclusion in the ACGM is done in close collaboration with the Texas Common Course Numbering System (TCCNS). The TCCNS is "a cooperative effort sponsored by the Texas Association of College Registrars and Admissions Officers." The system came about to assist in evaluating transcripts more easily to determine transfer courses. The TCCNS, then, is a voluntary collection of self-identified course equivalencies. Every institution has a TCCNS representative who coordinates this system, collects information from each department to identify these courses, and sends the list to the central TCCNS office that is housed at The University of Texas-Pan American. Dr. Goeman directed attention to the website, www.tccns.org, where this information is presented in a searchable online matrix.

The ACGM and TCCNS work closely together in that about 97 percent of courses in the ACGM have common course numbers. The TCCNS is run by its member institutions (for-profit institutions are not represented as they are accredited by a different accrediting body), but TCCNS administrators do not

have decision-making authority about course inclusion in the ACGM. In order to add a new course to the ACGM, the course must be developed with a title, description, learning outcomes, and parameters. The course is first presented to administrators from the TCCNS to describe the value of the course, the level of acceptance of colleges willing to teach it, and the willingness of universities to take the course in transfer and applicable to a major. If these administrators approve, the course is sent on to the Coordinating Board for the approval of the ACGM Committee. Prior to the face-to-face meeting of the ACGM Committee, there is a 30-day period for public comment, during which time faculty throughout the state may provide input on the proposed new courses (and any updates proposed to courses already in the ACGM). The ACGM Committee examines the information about the courses and evidence regarding need and acceptance, hears the presentations, considers the comments submitted during the comment period, and votes to either accept or reject the proposed new courses or course revisions. The new courses or course revisions are then included in the next addition of the manual.

Dr. Goeman then opened the floor to questions. A question was raised regarding notification of faculty when such items are open for public comment. Dr. Goeman responded that this is a challenging area for the Coordinating Board. Typically, word is sent from the Coordinating Board to the Chief Academic/Instructional Officers on campuses, and sometimes it gets no farther. He encouraged Council members to spread the word to their colleagues, at both their own institutions and those not represented, to watch for this so that the courses can become the very best possible and nothing is overlooked.

A member asked what happens if colleges are not teaching courses as required by the ACGM. Dr. Goeman stated that, if a complaint is filed, the Coordinating Board can investigate and find the source of the problem. After examining syllabi, if it is discovered that the learning objectives for a course are not all being covered, an administrator would be contacted. Students will not be prepared for the next course in the sequence if all learning objectives are not being covered.

Chair Nelson suggested that information on course assessment with an eye to the requirements may be of use at a future meeting. Dr. Goeman stated that it is critical that courses have value in degree programs. Currently, with budget difficulties in the state, legislators are tightening requirements for funding, transfer rules, and degree plans. The maximum number of allowable semester credit hours (SCH) for a bachelor's degree is now 120 (unless a waiver is requested and justification can be made). Students no longer get to take elective courses in their programs, and too many credits can actually cost them benefits such as the Tuition Rebate Program. Also, students going more than 30 SCH over their degree plans must begin paying out-of-state tuition. Therefore, it is imperative that every course in the ACGM can be applied to a degree plan somewhere.

Criteria for course inclusion in the ACGM are being tightened up as well for this reason. Those criteria are being increased, and will soon include the requirement that at least five universities are willing to accept a course in transfer to apply to a degree program (currently, the minimum is two universities). A new criterion will be added – the support of at least five community colleges which are willing to teach the course.

A question was raised regarding the quality of distance education versus face-to-face instruction. Dr. Goeman stated that if the same quality of education and achievement of learning outcomes could not be shown using a distance education modality, then providing that course through distance education is not acceptable. Dr. Kevin Lemoine of the Coordinating Board supported this statement.

Another member questioned the criteria for acceptance into the ACGM and the subsequent communication of availability of the course. Dr. Goeman stated that the numbers of colleges and universities needed for acceptance is a threshold intended to establish relevance of the new course. After that, the hope is that the course will proliferate based on the usefulness of the course contents. Once the course appears in the ACGM the state guarantees two things: that the course is transferrable to other

institutions for use in a degree program (but institutions are not told how to apply the course unless it is in a statewide transfer compact or a statewide field of study curriculum), and that funding for the course will be provided.

When institutions do not accept these courses, a member of the Council asked what recourse the sending institution may have. Dr. Goeman said that the expectation is that the sending institution would contact the receiving institution to try to resolve the issue. If that does not work, he recommended that someone send an email to him or someone at the Coordinating Board so that an investigation can be initiated. Also, one-to-one articulation agreements can be set up between institutions to address any specific requirements beyond the minimum learning outcomes in the ACGM if needed. However, Dr. Smith reminded the Council that part of the current Tuning project will be to fine tune courses so that individual transfer compacts will not be necessary and institutions can sign the Voluntary Statewide Engineering Transfer Compact.

Dr. Goeman reminded the Council that the TCCNS is a self-reported system and that it depends on honesty and integrity if it is to work as intended. The system expects that people will do the right thing with respect to students transferring between institutions. General institutional feedback is positive on this system, as there is benefit both to the student and to the institution in using the TCCNS.

A question was raised regarding the monitoring of teaching courses as required in the ACGM. Dr. Goeman responded that this is up to the individual institutions. From the universities' viewpoint, if students consistently transfer from a particular institution ill-prepared, this should be seen as a symptom to be addressed. From experience, community colleges want their students to succeed, so if changes are found to be needed, the institution should address them.

Dr. Mary Smith reminded the Council that when institutions sign the Voluntary Statewide Transfer Compact for Engineering, which exists as a result of the first year of tuning in Texas, that signatory institutions will be agreeing to assess their courses for accuracy in terms of the ACGM. This assessment must be done a minimum of every three years. This is the process of fine tuning.

A five-minute break was taken at 10:45 a.m.

Going Forward – Next Steps

Dr. Smith introduced Dr. Reinold Cornelius of the Coordinating Board as the next speaker. Dr. Cornelius is the current liaison to the Tuning Committee for Biomedical Engineering, and served as liaison to the Tuning Committee for Civil Engineering during the first year of tuning in Texas. Dr. Cornelius will present specific information on the tuning process and deliverables.

Dr. Cornelius defined tuning as determining the competencies (knowledge, skills, and attitudes) a student must acquire in the process of completing a bachelor's degree. Fine tuning is a process that occurs later in looking at the specific courses that are needed for a student to gain those competencies. This process ties into the ACGM.

At this time, these committees are still working on the tuning process. Tuning is the process of setting expectations that are informed by the major stakeholders, such as faculty members and employers. Students, parents, counselors, and advisors will all benefit from this work by having a set of clear expectations.

The big picture shows three major questions to be answered: 1) what are the topics in the discipline that must be mastered; 2) who employs graduates; and 3) what information comes from the surveys to assist in the tuning process.

What are the discipline's topics?

The Expertise Profile shows the coursework that is needed for a student to complete the degree in the discipline. This can help students determine whether a particular career path is a good match. The Civil Engineering Expertise Profile was displayed.

The Employment Profile shows the major industries that employ graduates of the programs being tuned. The Civil Engineering Employment Profile was displayed.

What needs to be mastered?

Competency tables are created to establish the skills and levels of competency that are gained at different levels of education. Descriptions of these levels are written in narrative form, and then the graphic is created. As these narratives are written, the audience – generally, high school students and their counselors/advisors – should be kept in mind. Boundaries between these levels of achievement are fluid. What is common practice? What is required? What is desired? A sample of the competency table from the Civil Engineering tuning work was displayed. While engineering is driven by engineering program accreditor ABET, Inc.'s Student Outcomes A-K, science groups will need to determine their competencies but may be informed by the engineering outcome titles. Dr. Cornelius pointed out that the levels of educational attainment are color-coded on the schematic diagram. He also stated that all outcomes may not reach the highest level of cognition during the process of achieving a degree. Levels that are attained while engaged in professional employment are not displayed in the diagram.

The final portion of this deliverable includes a one-page description of each outcome title and what it means to the study of the discipline. A Council member questioned whether this was appropriate, for one discipline to "speak" for another. Dr. Cornelius reminded the Council that this is not that case, but instead serves to describe the use of the other discipline within the one being tuned.

The Council was reminded that this work is not intended to drive policy. It should be considered a framework for students to decide on a course of study.

The second portion of the work is the fine tuning, or using this information to define the learning outcomes needed in each course to achieve the goals of tuning. There are three things required for the fine tuning process: 1) the identification of the courses that must be taken during the first two years of the program in order to prepare for the completion of the degree; 2) an examination of the syllabi from different institutions to determine commonalities in descriptions, pre- or co-requisites, and learning outcomes, and then synthesizing the information; and 3) the establishment of a logical two-year sequence in a flow chart for these courses, considering pre- and co-requisites and skills needed.

After step #2 above, the Tuning Committee for Civil Engineering determined the learning outcomes required in the courses and rewrote the course description to reflect them. Their course descriptions and respective learning outcomes are being recommended for inclusion in the ACGM.

The Council was reminded that these courses are those that every potential Civil Engineer must take, and does not necessarily reflect all the courses people would like them to take or would like to teach. It also does not require community colleges to teach all of the courses, but these are courses that must be transferred into the degree program among signatory institutions. Survey information also helps determine how these courses are refined. Dr. Cornelius reiterated that the learning outcomes included in the ACGM are minimums, and that this does not dictate methodology for teaching the class. Academic freedom for instructors is maintained as long as all learning outcomes are achieved through whatever teaching methodology the instructor determines is appropriate for his/her students. The two-year program of study completed by the Tuning Committee for Civil Engineering was displayed.

Dr. Cornelius recommended that the tuning portion be completed at the next face-to-face meeting on September 16 so that the fine tuning can be started thereafter. Fine tuning should be completed next spring.

Wrap-up of Morning Session

Chair Nelson began a wrap-up of the morning session by speaking about the Memorandum of Understanding for the Voluntary Statewide Transfer Compact for Engineering being shared with the Council. Such a compact will result from the work of the current Council and its respective committees, and the example of the one completed from the first year may be informative.

The set of courses in the flow chart will be determined by the committees. Dr. Nelson mentioned a movement in the state that is counterproductive to the work of the Council. He stated that there seems to be a belief that the Coordinating Board is driving the work of the Council and determining the curricula. He reiterated that this is a faculty-driven project with facilitation by the Coordinating Board. In terms of the student learning outcomes for the courses in the curricula, these, too, are being determined by the subject area experts. Engineers are not determining the contents of math courses, for example.

One additional point was made about the relationship between the ACGM and the Transfer Compact. Dr. Nelson emphasized that the ACGM is the foundation; the articulation agreement builds on that foundation. As signatory institutions, all agree that the courses listed are foundational to the discipline and agree to assess their courses to the standards set in the ACGM.

Dr. Nelson pointed out that the levels on the competency tables – high school, community college, university, and graduate school – reflect the levels of competency expected when a student leaves that level and begins the next. There must be cooperation among institutions to ensure that students are adequately prepared for the next level to ensure their success.

Dr. Smith pointed out that there are templates on the flash drives that match the formatting of the deliverables for use by the current committees. There is also a complete packet from the Tuning Committee for Civil Engineering for examination. This is to be used as a reference, since the final packets from each committee will be unique.

Dr. Smith also emphasized item number 2 on the Memorandum of Understanding. The goal of the Coordinating Board is to create a single articulation agreement that will suffice for multiple institutions to facilitate transfer for students throughout the state. The courses listed on the engineering flowcharts are guaranteed to transfer into the engineering programs of those institutions that agree to sign the Transfer Compact. She acknowledged that there will be institutions that cannot sign this agreement due to their inability to provide space for every student who would like to attend. However, those that sign guarantee admission to students who complete the requirements outlined in the Transfer Compact and on the flowcharts into the engineering program at a signatory institution.

A question was raised regarding the wording, "automatic admission" as opposed to "eligible for admission." Dr. Smith stated that this point had been debated among executive staff at the Coordinating Board, and the decision was to maintain the "automatic admission" language. She gave the example of The University of Texas at Austin, whose engineering departments are able to accept only a very select few student applicants into engineering. Since their programs are so full of native students, they are extremely limited as to the number of students who can be accepted in transfer. This institution is unable to sign an "automatic admission" compact. However, there are many engineering programs at universities in Texas who can accept numbers of transfers to fill the available space, and this is the targeted audience for such a compact.

Dr. Smith called the attention of the Council to the *Closing the Gaps by 2015* report for the State of Texas. The state has just four years remaining to accomplish the goals of *Closing the Gaps*: student participation, success, excellence, and research. There is a progress report available on the Coordinating Board website. STEM graduates are far behind the goal for this point in the plan. We would need to double the current number of STEM graduates in the next four years in order to reach the goal. Therefore, the task being done is extremely important to the state.

Dr. Smith dismissed the groups to breakout sessions at approximately 11:45 a.m.

Breakup into Discipline-Specific Committees/Lunch with Team

Committees met for the initial work session in the following rooms:

1. Blanco Room - Members of the Tuning Committee for Biomedical Engineering
   Chair: John Criscione
   Co-Chair: Lennine Bashiri

2. Guadalupe Room - Members of the Tuning Committee for Chemical Engineering
   Chair: James Holste
   Co-Chair: Steve Rathbone

3. Barton Creek Room - Members of the Tuning Committee for Biology
   Chair: Lee Hughes
   Co-Chair: Marisela Rodriguez

4. San Gabriel Room - Members of the Tuning Committee for Chemistry
   Chair: Darren Williams
   Co-Chair: Chris Wild

Boxed lunches were served to provide time for a working lunch. Each group received brief instruction on SharePoint and LiveMeeting Software.

Discipline-Specific Committees Report Out to Full Council

Dr. James Nelson, Council Chair, called the meeting to order at 2:00 p.m. He asked committee chairs to report progress of each committee and any stumbling blocks they have experienced. Dr. Darren Williams, Chair of the Tuning Committee for Chemistry, mentioned that the only stumbling block was creating the document in pieces by groups. Committee members have committed to responding within 24 hours when information is received so that the work gets done between LiveMeetings. Dr. Williams stated that the committee is making great progress.

Dr. James Holste, Chair of the Tuning Committee for Chemical Engineering, reported that they have the advantage of following the lead of the first year's engineering tuning. The committee must recognize the ABET influence, but will be specializing the work for their discipline. He mentioned that they have not encountered major stumbling blocks, but still have a lot of work to do.

Dr. Lee Hughes, Chair of the Tuning Committee for Biology, reported that the committee has begun determining their outcome areas and divided the work among group members in teams of three. The goal is to have some of them in a refined draft stage before the next LiveMeeting, and most nearly complete by the next face-to-face meeting in September.

Dr. John Criscione, Chair of the Tuning Committee for Biomedical Engineering, stated that the committee is working on the outcomes and he expects to finish those by the next LiveMeeting. One stumbling block they have experienced is trying to determine a direction for the Expertise diagram.

Closing Remarks and Issues to be Resolved

Chair Nelson suggested talking about the charts briefly. He reminded Council members that they received a file on the first USB drive that contains information on what each of the six levels of comprehension mean, and verbs to use for those levels of the Bloom's taxonomy. Dr. Nelson promised that staff will provide committees with a larger table to use for each outcome to determine what each level means, and asked that the Council allow a couple of weeks for this to go out so that the proper guidance can be provided with it.

He described the audiences for the different deliverables. Parents and students comprise one of the audiences, and the Key Competencies, Employability, and Expertise charts being developed are intended for this group. Another piece coming out is more for faculty. Related to the articulation compacts, the assessment of the courses in terms of what is in the ACGM is key for faculty members teaching the courses. While this is a little later in the process, it is an important part to think about so that universities will be comfortable accepting courses in transfer from participating institutions. Dr. Nelson encouraged Council members to look forward, as looking backward at this point is counterproductive. Much of the purpose for the current Council is to facilitate transfer for students while maintaining the quality of the instruction statewide.

He reminded members to complete the evaluation forms. The next meeting, still somewhat tentatively, is set for September 16. The hotel has been booked.

Lastly, the timeline for this work was really outlined by Dr. Cornelius during the morning session. Dr. Nelson asked the Council to use this as a target timeline. The goal is for this Council to complete its work in May 2012.

Adjournment

A motion to adjourn the meeting was made and seconded at 2:25 p.m. The meeting was adjourned by Chair Nelson.