

Notes from Math Discipline Workgroup Meeting #1 July 18, 2007

Hillary Fuhrman welcomed everyone and introduced Missouri Department of Higher Education (MDHE) staff present.

Deputy Commissioner Paul Wagner reiterated her welcome and mentioned reasons why this meeting was important:

- 1) Address the tremendous gap between K-12 and higher education
- 2) 35% - 40% of students need remedial work
- 3) Frustration with society's acceptance of those who are bad at math.

Ms. Fuhrman proceeded with the rest of the introductions and then presented the goals for the meeting following the slide on p. 3.

Today's Goals

Particular attention was paid to:

- 1) The context of the current discussion on curriculum alignment.
- 2) The overall vision for these meetings.
- 3) The emphasis on collective decision-making.

It was emphasized that those present were in charge as they were the experts in their field. The MDHE staff was simply there as facilitators to help the group focus and define their next steps. One of the necessary outcomes for this meeting was the selection of two representatives to serve on a Steering Committee.

Two questions were raised:

- 1) Did the facilitators of this meeting have realistic expectations for what could be accomplished? Was the overall goal to come out with some sort of unified expectations for students/education?
- 2) Was the primary focus going to be on exit or entrance competencies?

It was determined that both of these questions would be discussed and answered throughout the remainder of the meeting today.

National Curriculum Alignment

"Curriculum Alignment" is a "nebulous phrase" that is played out across two areas:

- 1) Secondary to Postsecondary Alignment
- 2) Postsecondary Course Alignment

Resources were passed around for those present to look at and discuss later.

"Secondary to Postsecondary Alignment" is of particular concern as the expectations between secondary and postsecondary educators are so vastly different. Secondary curricula do not necessarily lead to postsecondary success, even though 90% of students profess interest in continuing on to postsecondary education. It was mentioned that the

State Board of Education revised standards last year which led to the coordinating Board of Higher Education (CBHE) revising the 42 hour General Education Block.

Assessment was described as being a sort of gatekeeper between secondary and postsecondary education. MODEC and placement tests were discussed as examples. The wide range of scores that were acceptable by various postsecondary institutions made preparation for these tests problematic. Students do not currently have a clear message as to what they need to do to prepare for college.

The discussion was turned towards concerns with “Postsecondary Course Alignment”. Paramount concerns were:

- 1) Differences between course numberings and standards
- 2) Differences between institutional missions, goals, and related standards

Resources aimed at correcting these differences were passed around. These included examples of state initiatives from Colorado and Illinois as well as The American Math Association of Two Year Colleges (AMATYC). Some of the better state-level alignment work involves course competencies, outcomes, and contents. Much of this work has been mandated by state law. In Missouri, the Department of Economic Development has been working hand-in-hand with the Department of Elementary and Secondary Education (DESE) and MDHE to maximize the value of student learning to insure the future of the state’s economy.

National Context/Drivers

On a national level, much of curriculum alignment has been driven by No Child Left Behind (NCLB) and the Spellings Report “A Test of Leadership: Charting the Future of U.S. Higher Education.” The Spellings Report has promised that it is not another NCLB for higher education. Instead, it is focused on increasing accountability, affordability, and accessibility to postsecondary education. In order to do this, the Higher Learning Commission has been working on accreditation and assessment issues. They are particularly concerned with assessing student learning outcomes and discerning the real value of what students actually learn.

Historical Curriculum Alignment in Missouri

The Missouri K-16 Coalition was formed in the mid-90s to coordinate alignment from secondary to postsecondary education. It was driven by administrators and was not inclusive of faculty involvement or knowledge.

In 2005, a General Education Policy and Matrix were developed. As part of this, credit transfer guidelines were created to facilitate transfer among Missouri higher education institutions. This project was again primarily administrator-driven. The results were very broad and ignored significant course differences.

DESE has been revising Grade Level Expectations (GLEs) from 2000 through the present because of NCLB. They are now leaning more towards end of course evaluations (or Course Level Expectations, CLEs) that would potentially compose anywhere from 10-

20% of a student's grade. These evaluations would replace the MAPS. They need to role out the first of these exams by the 08-09 school year. These exams have been created primarily with input from secondary educators, with very little from persons in higher education.

MoDEC entry level competencies were also mentioned. The work done with this is going to be considered as a good starting point. It is again, imperative, that faculty is involved with whatever competencies/assessments are created next. "Entry Level Skills for College Preparedness in College Algebra" and "DESE's Grade and Course Level Expectations" were also referred to.

One of the participants estimated that in his area of the state anywhere from 80% - 90% of the students that graduated went on to some form of higher education. It was reiterated that all students that graduate from high school should have at least the same level of general competencies – whether they plan on going on to postsecondary education or into the workforce. The Department of Economic Development has also been pushing for this as the vast majority of jobs in the state are on their way to becoming knowledge-based. This shift in the economic sector means that for state citizens to be employed, they will need to have the same competencies as their peers who continue into postsecondary education. It is becoming increasingly difficult for those without some sort of higher education to be able to find decent jobs. Traditionally, high schools have not been geared towards either track.

Current Missouri Drivers

Of particular importance to the current discussion is the Math, Engineering, Technology, and Sciences Coalition, or the "Missouri METS Coalition". This coalition is concerned with the future of Missouri's economic development. A summit last year included leaders in the business world who delivered recommendations to Governor Blunt. These recommendations focused on the need to improve curriculum alignment across the board in these subjects. They recommended that such alignment be particularly focused on math as this subject was often the gatekeeper to engineering, technology, and the sciences. These recommendations led to Senate Bill 580 and the creation of the P-20 Council. This council involves the Missouri Department of Higher Education (MDHE), the Coordinating Board of Higher Education (CBHE), the Department of Elementary and Secondary Education (DESE), and the Department of Economic Development (DED). DESE has made a particular commitment to align with MDHE. Thus the work that will be done in these meetings will inform the work that DESE does.

The recently passed Senate Bill 389 is the catalyst that drives this specific project on curriculum alignment. Section 173.005 states that

*The coordinating board shall establish guidelines to promote and
58 facilitate the transfer of students between institutions of higher education within
59 the state and shall ensure that as of the 2008-2009 academic year, in
60 order to receive increases in state appropriations, all approved public
61 two- and four-year public institutions shall work with the commissioner*

*62 of higher education to establish agreed-upon competencies for all
63 entry-level collegiate courses in English, mathematics, foreign
64 language, sciences, and social sciences associated with an institution's
65 general education core and that the coordinating board shall establish
66 policies and procedures to ensure such courses are accepted in transfer
67 among public institutions and treated as equivalent to similar courses
68 at the receiving institutions. The department of elementary and
69 secondary education shall align such competencies with the
70 assessments found in section 160.518, RSMo, and successor assessments;*

Of particular concern is the need for alignment between DESE and MDHE. At this time, 35% of students in Missouri higher education have to take remedial courses. This is cause for significant concern. These courses do not offer college credit and cost the state significant amounts of money. Those who must take these courses have a far lower chance of ever completing an undergraduate degree. Of course, these statistics vary by the selectivity of an institution. For example, at a highly selective institution, students who would typically be placed in a remedial course are offered other solutions, such as tutoring, that are not tracked in the same way. There is no data on how many of the 35% are typical 18-year-olds or are instead more non-traditional students who may have been far away from an educational setting for any number of years.

Curriculum Alignment Organizational Structure

Senate Bill 389 mandated the creation of faculty-based discipline workgroups covering mathematics, sciences, English, social sciences, and foreign languages. The METS coalition and STEM education have led the MDHE to develop a discipline workgroup in engineering and technology. The MDHE has also decided to create a discipline workgroup in the humanities so that no major discipline is ignored.

After these faculty-based workgroups have met and determined the scope of the work to be done, two members from each workgroup will become a part of an over-arching steering committee. This steering committee will be composed of faculty members, administrators, and MDHE staff. While the official charge of this steering committee has not yet been developed, one of their primary goals will be to coordinate the efforts of the various discipline workgroups and to compile documents and recommendations for the MDHE Commissioner to present to the CBHE. The work of the discipline workgroups and the steering committee will not be tied to a concrete timeline until a better understanding of the scope of the work to be done is gained.

Vision

One of the key purposes of this meeting is for the faculty to tell the MDHE what their vision is. What is it that faculty would like the MDHE to “charge you with” (to give you a political mandate for)? The vision of the MDHE for these meetings is to

- 1) smooth transitions from secondary into postsecondary education (lower remediation rates) and

- 2) to smooth transitions amongst higher education institutions for those who do not finish the 42 hour general education block or those who go through transfer “swirl” or concurrent enrollment.

Concern has been raised about selecting “college algebra” as the definitive entry-level course. This is an issue that is up for participants in these discipline workgroups, particularly the knowledgeable faculty, to decide. At this point, it may be helpful to discuss what curriculum alignment is and is not:

Curriculum alignment today is an opportunity to influence public policy. Curriculum alignment is not a road to across-the-board assessment. The goal here is to realize and to demonstrate that local autonomies can work well together, and that there is no need for a statewide blanket assessment.

According to Deputy Commissioner Wagner, the some state legislators may not be in tune with what is going on at state institutions of higher education and some of their information, regarding transfer, may come from occasional constituent anecdotes. This is an opportunity for us all to make our legislators more aware of what is going on with the state’s higher education institutions. It is an opportunity for us to have a say in determining and creating public policy. The MDHE staff is here to serve you and to help you achieve your goals. It is up to you to decide how detailed or how broad the core competencies are.

A concern was raised that high school algebra does not stick in the minds of students. Dual credit courses often are very successful. This means (perhaps) that it is not the high school teachers that are doing poorly, but that the gap of time between when a course is taken in high school and when the student next encounters math in college is what causes the high need for remediation. Of course, those who take dual credit courses are often a minority of a student population.

Another concern was raised that high school math courses do not build on, nor reinforce one another. This exacerbates the time gap between learning (for example) high school algebra and taking college algebra.

Another item of concern was that the term “remedial” math is perhaps misleading. With the exception of those who take advanced mathematics or dual-credit courses, many of the students in “remedial” math perhaps never even took appropriate courses in high school and so never learned what they should have learned to be successful in college.

The workgroup discussed the need to continue to raise rigor, to pull DESE up towards our standards. For example, college algebra was initially a remedial course. While considering college algebra as *the* entry-level course is problematic on many levels, it is a good starting point for discussion. Is this a course that should again be considered as remedial, should it be considered as an entry-level course, or should we accept that it is something that students *aspire* to take after several “remedial” courses?

The workgroup broke for a working lunch during which members discussed the direction of the workgroup.

After lunch discussion resumed on the entry-level and exit-level competencies. Deputy Commissioner Paul Wagner clarified that the entry-level competencies were for entry into collegiate level mathematics, but are not tied to a specific course. Mr. Wagner stated that the exit-level competencies were tied to specific entry-level courses that would be determined by the workgroup.

The workgroup discussed the need for better habits of mind of entering students and determined that the entry-level competencies would include some habits of mind competencies.

The workgroup then discussed which courses would be selected for the development of the exit competencies. Many workgroup members expressed the just college algebra should be used because it was a prerequisite to higher level mathematics coursework and that most students took college algebra. Other workgroup members felt that this would leave students who did not take college algebra and noted that there are number of courses that are on the same level as college algebra. After much discussion and a vote, it was decided that the workgroup would focus on the following courses;

- College Algebra
- Finite Mathematics (not College Algebra based)
- Beginning Statistics
- Pre-Calculus
- Trigonometry
- Calculus I (time permitting)

The workgroup then elected Dr. Mary Shepherd and Dr. Yungchen Cheng as its representatives to the Curriculum Alignment Steering Committee (CASC). Drs. Shepherd and Cheng will also serve as co-leaders of the Mathematics Workgroup.

Drs. Shepherd and Cheng then led the workgroup in setting the agenda for the next meeting. Members will break into smaller groups to begin work on each course listed above and will report on their work at the next meeting. There will also be a report on the development of the entry-level competencies. Drs. Shepherd and Cheng will report on the activities of the CASC.

Ms. Fuhrman explained that she was working to secure a course management system (such as Blackboard) to facilitate discussion and document sharing. Ms. Fuhrman stated that she would send out an email with further information.

The next meeting is planned for late September and is still to be determined by group members. The meeting will be held at the MDHE offices in Jefferson City.

