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Missouri's diverse autonomous education system has embarked on a collaborative journey stimulated by average student performance, the need for better preparation for college, and concerns for a better-prepared work force. Leaders from education, business, and government have joined to collectively emphasize a seamless educational system. Mathematics is the focus of the state's first K-16 project in its effort to raise expectations, improve performance, and make schools, colleges, teachers, and students more accountable.

Seeking Cooperation: Missouri's K-16 Coalition

Today's K-12 students become tomorrow's college students, while college graduates from teacher education programs become the work force for elementary and secondary schools. Although this interdependence is a reality, state educational systems often operate without coherence, consistency, or alignment. Statutory responsibility for most state systems of public education is shared. State-level boards involved in designing and implementing policy are being challenged to acknowledge the systemic nature of their work and to seek new collaborative frameworks for crossing traditional boundaries (Timpane, 1998).

According to the National Association of System Heads (NASH), at least 18 states have initiated some type of formal K-16 activity. While the approaches vary, common threads consist of strategies to serve students better, create more comprehensive, coordinated, and seamless state educational systems, and raise expectations and performance levels of all students. By emphasizing the success of underserved/underrepresented populations, attention is drawn to both urban and rural concentrations of low-income families.

The Missouri K-16 Coalition, sponsored by three separate state boards, was officially announced in December 1997. The governor expressed his belief that "this Coalition can help create a seamless system of education—a system that will improve the performance of our students" (Coordinating Board for Higher Education, 1998). In the year since its first meeting, Missouri's Coalition has experienced growing pains, and understanding its experience with K-16 provides an important perspective for states seeking to create historic new partnerships in support of high educational standards for all students.

Missouri Educational Systems

Missouri has a diverse educational system that operates within a rich tradition of local autonomy. Five hundred twenty-five (525) local school districts oversee the elementary and secondary education of the state's 895,304 public school students. At the postsecondary level, 23 public colleges and universities, 26 independent institutions, and over 120 private career schools enrolled over 320,000 students in FY 1997. In many cases, separate boards govern each of these institutions.

At the same time, three constitutionally based boards appointed by the governor and confirmed by the state senate have major responsibility for developing and implementing state-level educational policy that supports an accessible, cost-effective, and high quality educational system. While the State Board of Education (SBE) focuses its primary attention on the K-12 sector, the Coordinating Board for Higher Education (CBHE) works primarily with two and four-year public colleges and universities, including the University of Missouri (UM). The Universities Board of Curators serves as the governing entity for the state's four-campus public doctoral-granting institution, which accounts for more than 25 percent of the students attending a public higher education institution in Missouri.

Collectively, public education here is a multibillion-dollar investment. While state appropriations to K-12 in FY 1999 exceeded \$3 billion dollars, including a dedicated one-cent sales tax, those to higher education were over \$1 billion. Although the SBE, the CBHE, and UM are each delegated specific statutory responsibilities, they share several commitments, e.g., a commitment to equity and quality, a link with local communities, an emphasis on assessment of student performance, and a concern for preparation. Understanding these common themes provides an important perspective on the precursors leading to their cosponsorship of a new partnership, the Missouri K-16 Coalition.

Common Themes

A Commitment to Equity and Quality

Missouri's commitment to equity for all K-12 students is well entrenched. While the movement to restructure its K-12 system has undergone several iterations, the state's government, business, and educational leaders have consistently envisioned educating all students to high levels. Initiated in 1984 and replicated throughout the world, its Parents as Teachers program educates parents about child development in the belief that every child should have an educational advocate. In its decade-plus commitment, the state's court system designated large sums of its resources for school desegregation in the two major urban areas. Most recently, the SBE emphasized that "[e]very child in our schools today is, in fact, an American dream waiting to come true" (Missouri State Board of Education, 1998).

The CBHE is committed to educational equity and quality and supports a coordinated, balanced, and cost-effective delivery system (Missouri Coordinating Board for Higher Education, 1998a). While tuition and fees at its postsecondary institutions have continued to rise, Missouri traditionally has had a historic commitment to low tuition and fees. Within this context, the CBHE strives to make the state's higher education system financially, geographically, and programmatically accessible (Coordinating

Board for Higher Education, 1998b), including financial aid programs that consider cost of attendance and expected family contributions in an attempt to remove financial barriers, while new state initiatives support the concept of access to the 13th and 14th years for well-prepared students.

Missouri's plan for the statewide delivery of technical education involves twelve separate service regions. Community colleges partner with other educational providers and business leaders to provide geographic and programmatic access to technical education. The state is committed to increasing the participation and success of underrepresented groups in higher education and to design an effective telecommunications-based delivery system to increase access. Through a Funding for Results Program, institutions are held accountable for quality results and continuous improvement. Responding to specific concerns about access issues, UM formed an access advisory committee to "examine why Missouri citizens fail to understand the full range of educational opportunities available in Missouri higher education and to recommend strategies to improve access to the university for capable students" (University of Missouri, 1997). UM is committed to maintaining high academic standards while forming partnerships with other educational providers.

A Link with Local Communities

It is important to understand the state's commitment to linking its educational resources to the grassroots philosophies of local communities. Statewide boards have been challenged to promote their state interests within the context of these local concerns. In fulfilling their statutory obligations, members of the SBE, the CBHE, and UM have gained extensive experience in identifying and working with local community interests, and the rules for board appointments emphasize the importance of being responsive to communities.

An Emphasis on Assessment of Student Performance

Systematic and regular assessment of student performance in Missouri has evolved over several decades. Initially, the lack of consequences associated with student assessment created in both the K-12 and postsecondary sectors a "safe environment" in which to experiment. Different grade-level and content-area strategies were used to promote assessment of student performance. In the K-12 sector, state testing is mandated in the core subject areas at specified grade levels that depend on the discipline. Although specific assessment instruments have undergone refinements and iterations and the testing frequency has increased, the mandatory nature of the testing for K-12 students has remained constant.

With the exception of teacher education students, assessment within higher education has been encouraged without a legislative mandate. State law requires teacher education students to pass state-approved entry and exit-level tests in order to receive initial certification. In the mid-1980s, state leaders challenged colleges and universities to develop assessment programs that would improve quality and demonstrate effectiveness. All institutions have responded to the challenge, though consistency across campus boundaries is not required. In both K-12 and higher education, providing assessment results to external constituencies has become the norm.

Although assessment has been integrated into Missouri's educational culture, lively debates concerning the value/limitations of particular instruments still occur. Both sectors struggle to balance the use of nationally standardized tests and those performance-based activities deemed more authentic. While today's generation of K-12 tests integrates multiple-choice and performance-based activities, higher education assessments vary from one institution to the next. Except for a few years when university policy mandated the use of a state-developed general education assessment, UM faculty and departments have exercised great latitude in assessing student outcomes in both general education and their majors.

Missouri's educational sectors have not escaped the call for greater accountability. Concerns about increased accountability are often complicated by questions about the number, type, and definitions of data elements used and to whom the findings should be reported. In passing the Outstanding Schools Act in 1993, the state legislature sent a clear message that, regardless of these implementation issues, assessments should provide concise, easy-to-understand evidence of accountability. The CBHE's annual report to the SBE describes, by high school, the performance of public high school graduates in the state's system of public higher education. Although the K-12 and higher education sectors emphasize the importance of having data systems that report the performance of students, faculty, and institutions, coordination is lacking between the separate and independent data systems that have evolved. All three boards have stressed the need to better coordinate the statewide data systems maintained by each board.

A Concern for Preparation

Despite the SBE's vision of helping each student realize his or her potential, high school graduation rates draw attention to the discrepancy between expectations and actual performance levels that fall below the national average. Because approximately 25 percent of Missouri's freshman leave high school prior to graduation, the opportunity to adequately prepare youths to enter the work force is significantly reduced. High school students taking the ACT score just above the national average, and only slightly above 50 percent of graduates go on to college immediately upon graduation. Concerns about Missouri's future work force are further exacerbated by both the number of first-time, full-time, degree-seeking students who need remedial coursework and the fact that less than 50 percent of them actually complete degree programs at public institutions. During the early 1990s, the state's public colleges and universities voluntarily adopted differential admission standards, resulting in a tiered system with minimum standards for each tier based on students' percentile ranks from high school grades and college admission test scores. Implementation of this policy sends a direct message to students and parents that preparation during the high school years is important. While access remains a crucial state goal, preparation and performance at the secondary level now have immediate consequences for a student's options at the postsecondary level.

An Alignment Agenda

Many activities linking K-12 with higher education existed prior to the establishment of a statewide K-16 effort. While activities such as school/college partnerships,

tech prep, professional development programs in science and mathematics, faculty disciplinary alliances, and advanced collegiate-credit opportunities targeted for high school students predated the official launching of the K-16 initiative, it was the lack of adequate high school preparation by students pursuing collegiate-level work that drew statewide attention to the existence of separate policy initiatives. In the mid-1980s, the SBE awarded a “College Preparatory Studies Certificate” to high-performing college-bound students who voluntarily completed a rigorous core curriculum and demonstrated outstanding academic achievement. By the mid-1990s, both the CBHE and UM linked completion of that rigorous curriculum in high school to college admission.

Although similar goals and expectations about course completion were included in both the K-12 and higher education policies, varying policy details created confusion for parents, advisors, and prospective college students. By engaging both secondary and higher education faculty in discipline-based discussions and in the review of curriculum materials, recommendations for revising board policies to achieve mutual consistency were accepted. The boards collaborated with schools and parents to promote adequate student preparation statewide. As a result, between FY 1992 and FY 1998, the percentage of first-time full-time students at Missouri’s public four-year institutions who completed the core curriculum in high school increased from 46 to 92 percent.

Yet, is this enough? Missouri’s educators continue to highlight the importance of creating a seamless transition between high school graduation and college entrance. While college course-placement programs vary, legislators and business leaders express a growing concern about low student performance. For example, in FY 1997, 27 percent of freshmen at the state’s public two and four-year institutions enrolled in some remedial coursework. Furthermore, in FY 1998, the six-year graduation rate at public four-year institutions was only 49 percent, and the three-year graduation rate at public two-year institutions was just 22 percent.

Missouri’s K-16 Coalition—A Sense of Urgency

Several forces began to converge just prior to Missouri’s decision to initiate the jointly sponsored K-16 Coalition. The sponsoring boards held discussions on topics of mutual concern, focusing attention on the transition from high school to college as well as on teacher training and professional development. In an effort to utilize the State-wide Transfer and Articulation Conference as a forum for discussion by administrators, faculty, and support personnel from both K-12 and higher education, the SBE joined the CBHE and UM as a cosponsor. Reform efforts within K-12 resulted in new performance standards for K-12 students, along with a new state testing program. Legislation covering community college tuition and fees for students who graduate from A+-certified high schools (those meeting state-designated criteria) was enacted. Collegiate-level dual credit programs offering both high school and college credit for the same course began to proliferate. The sense of urgency concerning the need for enhanced quality in undergraduate science, mathematics, engineering, and technology education was authoritatively addressed in the National Science Foundation (NSF) monograph, “Shaping the Future: New Expectations for Undergraduate Education in Science, Mathematics, Engineering, and Technology.” A UM-sponsored team of key Missouri leaders began to attend the National Association of System Heads’ summer K-16 institutes.

Strategies

From its inception, several strategic decisions influenced Missouri's K-16 initiative. Structural and process decisions were made to balance K-12 and higher education issues and to separate theoretical from technical exploration. By appointing legislators, college presidents, directors of K-12 organizations, and officers of major foundations to the K-16 Coalition, the sponsors hoped to focus the state's attention on the importance and urgency of K-16 issues. It is crucial to emphasize that the coalition is not a policy board. It is, instead, structured to ensure that important educational issues will be publicized, that new state policies in support of coherence, quality, and efficiency will evolve, and that support will be garnered for new and expanded partnerships committed to systemic educational reform.

The initial charge directed the coalition to 1) develop agreements on what students should know and be able to do, 2) promote quality performance standards that reduce remediation; 3) increase public awareness of the importance of improved performance; 4) encourage better communication within and across educational sectors; 5) identify strategies for student success based on preparation and ability; and 6) make policy recommendations to the coalition's sponsors.

Mathematics was targeted as the first academic discipline to be scrutinized. Several factors explain why: An understanding of mathematics provides students with a solid foundation for acquiring those essential skills that can be transferred to other learning experiences, e.g., problem-solving, deductive reasoning, and identification of alternative solutions. Students unprepared in mathematics are at a serious disadvantage, especially in advanced technological work environments. Because the state's K-12 assessment program was most advanced in mathematics, it was able to provide benchmark data on student performance in mathematics, including that from Missouri's participation in the Third International Mathematics Science Study (TIMSS).

The focus on grades 11 and 12 and the first two years of college placed the transition from high school to postsecondary education at the center of Missouri's initiative. The challenge of raising expectations and performance levels spotlights student learning in both sectors and promotes conversations among secondary school and college faculty. To ensure in-depth analysis and discussion of mathematics, the Mathematics Technical Advisory Committee (MTAC), made up of faculty only from both K-12 and higher education, was established to identify the key issues and to provide the coalition with expert review and advice. Their active involvement ensures the expression of their viewpoint in the development of state-level policy.

The magnitude and scope of K-16's working agenda proved somewhat daunting. By limiting the initial project, the temptation to be inclusive was curbed. Missouri's single-discipline 11-14 approach ensured that its focus would apply to all secondary students and higher education students, not just to teacher education students.

Accomplishments

Not too long after the coalition was formed, results from Missouri's participation in the Third International Mathematics and Science Study (TIMSS) were released. As anticipated, the state's performance in mathematics fluctuated around the national average. In response, the coalition emphasized its sense of urgency in arguing that aver-

age performance is not sufficient for a secure future. It has also passed three formal recommendations: The first encourages a common research agenda across the three sponsoring boards; the second calls for the early identification of each student's strengths and weaknesses so that deficiencies can be timely and adequately addressed; and the third requests the SBE and CBHE to explore ways for CBHE involvement in the reapproval process for state teacher education programs. In 1999, the Coalition has agreed to continue its work on student competencies, public awareness, and accountability, to review Missouri's approach to the professional development of teachers, and to seek ways to prioritize and coordinate issues in order to produce meaningful results, and it anticipates releasing a report on mathematics in October, 1999.

As the state begins a second year of K-16 work, it is also a time for reflection. The experiences of the past year serve as a foundation for understanding the many challenges of promoting partnerships across sector boundaries.

Process Obstacles

A new partnership requires attention to process. Important initiatives are often sidetracked, stalled, or actually fail when process is left to chance or when norms are allowed to emerge over time rather than being addressed directly. Initial coalition meetings set the stage for determining group norms. Early in the group's formation, agreements were reached on operating procedures. i.e., voting procedures that required a ballot mailed to all members concerning formal coalition actions. Despite attempts to reach agreement on process issues, several questions continued to surface: Who speaks for the coalition? Who should set agendas for coalition meetings? How should minority viewpoints be treated? The need to engage coalition members in collectively answering these questions became essential.

A board member from each sponsor serves on the coalition, and staff provide support for the coalition's work. Allowing discussions to occur in isolation can create tension, so a major challenge has been to provide regular, timely, concise communication about the coalition's issues and to allow enough lead time for discussion and input by all constituencies. This public, up-front presence not only informs, but dispels fears and misconceptions created in any major policy examination. Members and staff are encouraged to report to their sponsoring board and colleagues after every meeting, not just when K-16 major accomplishments have been achieved. News releases and fact sheets ensure that these reports are consistent and fair.

Language Barriers

Attention to language is especially important in forging partnership work. Labels can mean different things to different people and must be chosen with care. K-12 and higher education have evolved from separate cultures and often use different labels for similar things, e.g. "Dean's List" vs. "honor roll," or "Chancellor/President" vs. "principal." Culture-based labels often emphasize differences rather than similarities. Gender studies teach the importance of using inclusive terms. Labels perceived as "exclusionary" or that suggest hidden meanings may be used unintentionally. When promoting rewards for "faculty," coalition members were perceived as excluding "teachers." Analyzing the language used and its possible attached meanings helps to ensure that

the coalition is accurately communicating its messages. The use of neutral labels increases the likelihood that ongoing communication will be more open.

It is important to be cognizant that messages often carry an implicit value that either supports or impedes the evolution of partnerships. Emphasizing "preparation for postsecondary options" creates an image that the essential skills for all career ladders are similar and should be required of all high school graduates. This labeling dispels the assumption that the preparation essential for other pathways, e.g., work and the military, is significantly different from college preparation, thereby requiring a less demanding curriculum.

Coordination Challenges

Each board has had extensive experience in independently designing statewide initiatives; their separate cultures bring different expectations about the use of time, the approach to leadership, and familiarity with issues. Striking a balance between the different expectations of coalition members has not been easy. Some members prefer to philosophize about issues, while task-oriented members experience frustration when progress is slow. Coalition members need to feel that their time is being well spent. Although staff development of a framework for policy actions has helped to focus the discussions, the development of the framework itself brought constituency-related tensions to light, and ideas promulgated as a result of the framework's implementation have been controversial.

Missouri's K-16 coalition operates with limited resources. Initially, the necessity of setting up a separate account was not evident, and commitments to cover expenses were made by the coalition's sponsors without an explicit plan. Excessive time was spent in ensuring that all fiscal obligations were met. This occurred not because of a lack of resources, but due to confusion over which sponsor would cover which expense. Designing a budget with equal resources from each of the sponsoring boards is a concrete statement of commitment; using a fiscal agent reduces the energy required to negotiate the payment of expenses.

An inordinate amount of time is needed to ensure that the separate sponsoring boards are in sync. Benefits result from a commitment to systematic, regular communication rather than sporadic, crisis-driven communication. Participation of board and staff in intensive off-site working conferences has also helped to solidify a common understanding of issues.

Data Usage

While there is general agreement that data should drive discussion and policy development, decisions about the amount of data and the way it should be publicly displayed are more difficult. The tendency to dazzle with data has limited appeal. Coalition members are interested in simple quantitative statements that convey results in a concise, straightforward manner. A growing interest in the performance of at-risk youth has resulted in greater demands for disaggregated data, giving visibility to underserved populations. Coalition members also want to understand assumptions about the representativeness and usefulness of performance data. A clear statement about measurement definitions helps to inform proper interpretations.

Interest in tying performance on state tests to incentives that would ensure access to dual credit coursework and to college admission has resulted in a desire to better understand the content level in state tests and the extent to which these tests have diagnostic value at the individual student level. Staff who help interpret data can provide this important contextual information. Ensuring that these data experts are not only present at all meetings but are responding in a concise manner to questions about data is of utmost importance. Ideally, coalition members should be responsible for understanding the functional significance of data, while staff should ensure that data are not misused.

Acknowledgment of Factions

Despite the existence of a shared K-16 vision, coalition members often disagree about strategies to adopt in support of educational reform. Initial tendencies to want all differences resolved may be unrealistic or inappropriate. Because factions that feel ignored may potentially undermine partnership work, they should be provided the opportunity to express their positions early on so that differences may be acknowledged and addressed more directly. A healthy tension among factions helps individuals understand the perspectives of other members.

Conclusion

The structure of Missouri's K-16 Coalition provides both opportunities and constraints. By engaging state leaders in conceptual discussions, by providing expert consultation, and by setting a time line for results, the coalition has positioned itself to affect student learning in mathematics. Challenges remain, however, to keep pressure on each of the sponsoring boards to implement recommended policy changes and to maintain the state's interest in continuing its discussions about other K-16 issues. To the extent that the state establishes an ongoing forum that engages key legislative, business, and educational leaders in discussions surrounding curriculum coherence and sector alignment, Missouri's approach to K-16 will be considered a success.

Suggested Readings

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