Taking on the Teacher Supply and Retention Challenge: A Performance Focused Model for School-University Partnerships

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In this case study, we describe a strategic initiative that partnered public schools with the fifth largest land-grant university system in the United States to improve statewide recruitment, training, hiring, and retention of K-12 teachers. This effort sought parallel implementation among nine university system institutions in partnership with community colleges and public schools statewide. Related school-university partnership and organizational alignment literature is explored along with the model deployed and current descriptive performance measures.

Keywords: University, Partnership, Organization Development

Over the past century, universities and public school systems have been working together in partnership (Greene & Tichenor, 1999). Many of the partnerships have involved staff development, teacher training, and school leadership. Such school-university connections have engaged in complex development approaches that demand a significant commitment for collaboration on the part of stakeholders. "The most effective partnerships are dynamic and interactive, work toward common goals, and are characterized by a high level of commitment among group members" (Jenkins, 2001, p. 6). Similar to HRD efforts in other contexts, school-university partnerships hold considerable promise for revitalization and development. However, such efforts “must be vigorously supported and advanced by top leadership at public school and college levels” (Essex, 2001, p. 736); therefore, insights from HRD and related practices can make meaningful contributions to the alignment and development of such relationships.

This paper explores a leading school-university partnership in the state of Texas. The partnership under study was initiated by Texas A&M University (TAMU) Board of Regents. The TAMU Regents’ Initiative is a comprehensive change approach aimed at educational improvement from PreKindergarten thru to four-year degree completion (PK-16) for children and young adults throughout the state. The core Initiative issues explored in this study involve the addressing of a need that has reached critical levels throughout the United States (US)—the recruitment, training, hiring, and retention of teachers in public school systems. The nine TAMU System institutions were asked to collaborate in raising the numbers of teachers in the state and to explore ways in which teacher preparation and retention could be further explored and practices modified accordingly throughout the TAMU system in collaboration with statewide stakeholders. This effort relies on the alignment of several relationships including university-university, university-community college, and school-university partnerships.

Purpose and Research Questions

The purpose of this paper is to describe a university system-wide effort to address a statewide K-12 teacher shortage in the State of Texas. We outline the history and implementation strategy along with the most recent outcomes associated with the effort. Research Questions include: 1) What successes and challenges will result from a school-university partnership aimed at increasing statewide teacher supply?; 2) What similarities and differences exist between school-university partnership literature and the case study under examination?; and 3) What is the future for such programs and related research?

Method

As previously identified, this paper combines an exploration of available literature on school-university partnerships with an exploration of a related case. Descriptive data is used to measure the differences between variables associated with stated goals at time 1 (the start of the partnership) and time 2 (year three of the partnership). Increases and decreases in variables associated with teacher supply are assessed.

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Review of the Literature

This paper explores an effort by a US land grant university system to align individual universities in a system-wide partnership with public schools toward growth of teacher training, hiring, and retention in order to address teacher shortages in the state of Texas. A vital element in the examination of the potential for partnership development between schools and universities is the examination of previous school-university partnerships, their successes and challenges. Awareness of prior partnership attempts may be used in early in partnership development. Although we found only a small number of articles focusing on school-university partnerships and even fewer articles exploring related issues from a research/scholarly perspective, Table 1 outlines the effective versus ineffective practices associated with the establishment of partnerships identified in the literature.

According to those authors who have explored school-university partnerships, “conversations among leaders on both sides of potential partnerships may be more successful if the practices presented are considered in getting a clear plan of action formulated prior to establishing the partnership” (Peel, Peel, & Baker, 2002, p. 44). From this point of view, educational partnerships need to approach the development of relationships in the same manner than that of any well run organization in the public or private sectors, whereby stakeholders collaborate in the development of policies and practices (Gayton, 1997). Well designed and implemented school-university partnerships can lead to movement in a positive direction toward change benefiting both sets of stakeholders (Gayton, 1997). The literature identifying effective and ineffective practices associated with school-university partnerships imply some basic “practices.”

Table 1. Elements of Effective and Ineffective School-University Partnership: Based on a Review of Available Literature

<table>
<thead>
<tr>
<th>Effective Practices</th>
<th>Ineffective Practices</th>
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<tbody>
<tr>
<td>Development of respect and trust between stakeholders</td>
<td>Cynicism and absence of outreach needed to maintain trust or to revitalize the breakdown of trust</td>
</tr>
<tr>
<td>Visionary leadership based on knowledge and needs</td>
<td>Lack of shared vision and/or low vision clarity</td>
</tr>
<tr>
<td>Strong commitment to mutual interests</td>
<td>Individual interests prevail and discussion of mutuality are artificial—lacking clarity and focus</td>
</tr>
<tr>
<td>Willingness to promote change</td>
<td>Resistance to change is unaddressed leading to lack of change or relapse into prior behaviors</td>
</tr>
<tr>
<td>Flexibility in managing and coping with change</td>
<td>Rigidity and emphasis on the reinforcement of past policies over the need to adjust system to meet current goals</td>
</tr>
<tr>
<td>Open and ongoing communication</td>
<td>Communication breakdowns are unaddressed or resolved inadequately</td>
</tr>
<tr>
<td>Partners strive toward constructive collaborative climate</td>
<td>Competitive approach to conflict is utilized with little or no responsibility taken when individual institutional interests are fostered over shared interests</td>
</tr>
<tr>
<td>Stable and detail-oriented project leadership</td>
<td>General concepts or ideas remain unrefined and unworkable and leadership is handed off from centralized leadership to lower levels</td>
</tr>
<tr>
<td>Adequate financial support</td>
<td>Mutual financial needs are not appropriately addressed</td>
</tr>
<tr>
<td>Acknowledgement of collaboration successes</td>
<td>Minimization of success and/or self-focused responses to collective achievements identified</td>
</tr>
<tr>
<td>Reward and recognition system aligned with mutual interests</td>
<td>Reward system is overlooked with regard to the partnership, or rewards for collaboration are not included</td>
</tr>
</tbody>
</table>

Adopted from Peel et al., (2002)

classifying more and less successful partnerships. Many of these practices are not unlike those encouraged in the organization development (OD) and HRD literature (Cummings & Worley, 2001; Rothwell, Sullivan, & McLean, 1995). According to Peel and Walker (1995), essential aspects in the establishment of functional school-university partnerships include: development of clear common goals, support of mutual trust and respect, maintenance of open communication, and ongoing clarification of shared responsibility by all stakeholders.
Stages of School-University Partnership Development

In addition to considering school-university partnerships from the perspective of effective versus ineffective practices, some researchers have explored school-university partnerships utilizing developmental stage models. Zetlan and Harris (1992) suggested that the following stages characterize the dynamics of a school-university partnership:

1. People are consumed with hostility.
2. There is a lack of trust as the partners build "mutual confidence."
3. There is a period of truce and equal participation.
4. Mixed approval and short-term successes are recognized.
5. Acceptance by both the school and university as they see the mutual benefits.
6. There is a time of regression due to attrition, faculty promotion, or lack of funding.
7. New members enter with new ideas that lead to renewal.
8. There is a continuation of the collaborative effort.

According to Peel et al. (2002) clear understanding of the stages identified above along with an operational understanding of the essential elements associated with school-university partnership success can lead to more effective implementation. Although the overall stage model presented by Zetlan and Harris (1992) is linear (suggesting that partnerships move consecutively from stages 1-8) the authors emphasized the importance movement from stages one and two toward a more connected and clearly delineated partnership in later stages. Other researcher and practitioners have identified program design and program implementation as key elements in the development of school-university partnerships. According to Tushnet (1996), although the most committed stakeholders may be able to overcome poor program design and implementation, clear outlining and execution of these two elements is viewed to be paramount. Partnerships may begin slipping when necessary steps prior to implementation are not sufficiently clarified and acted upon (Peel & Walker, 1993).

Partnership Financial Issues

Bullough and Kauchak (1997) indicated that universities and public schools face financial constraints due to the enormous size of each organization. Unless both entities are willing to pool their resources and work together in a collaborative manner, the partnership will most likely fail. This problem is especially true of educational partnerships in the rural southern US, which has the highest rural poverty rate in the nation (Davis et al., 1998). In most impoverished communities there is generally a feeling of isolation along with limited resources (Davis et al., 1998). According to Wilcox (2002), partnerships tend to fail when the financial issues overshadow the impending remuneration. Again, a vital need for successful partnerships includes realistic financial commitments from all stakeholders.

It is a reality that partnerships have to maintain adequate funding in order to co-exist. Unfortunately, for many communities in the southern US the funding is just not there (Davis et al., 1998). Therefore, if educational partnerships are going to exist, especially in many impoverished areas, greater financial creativity, flexibility, and an increase in community supporters are needed in order for the partnership to survive.

Leadership

Edens, Shirley, & Toner (2001), emphasize the importance of ongoing leadership in the development of school-university partnerships. The authors observe that a premature departure from central decision-making by top leadership diminishes the likelihood of school-university partnership success. According to Bullough and Kauchak (1997) ongoing representation by top school and university leaders is important to balancing information sharing and investment. In one case, a divestment in time and energy spent by a school representative was diminished leading to a more dominant role on the part of the university. This imbalance leads to partnership misalignment and perceptions that the efforts are initiated singly rather than joint school-university efforts. In such cases, leadership imbalance leads to insufficient formation of goals, unbalanced communication, and unequal responsibility.

Professional Development School Models

One of the most common occurrences of school-university partnerships are professional development schools (PDS) that involve training and other types of development-related exchanges. Often, these development oriented programs involve university leadership in the training of teachers or principles. However, the best PDS efforts involve grassroots connections between teachers and university representatives in the identification and development of innovative approaches to problem-solving (Carlson, 2001). A focus by partners on innovation has led to successful PDS efforts benefiting all stakeholders (Rakow & Robinson, 1997). According to Edens et al. (2001) recent research indicates that over the past decade, school-university partnerships have involved a 'series of false starts' and difficult turns leading to divestment by many stakeholders in the school-university partnership concept. Peel et al. (2002) suggests one of the reasons that PDS models tend to fail is because they operate on the fringes. "In order for PDS's to move from the margins to the center of our educational system [partnerships must
become the] accepted way of doing business in the schools and colleges" (Edens et al., 2001, p. 31). Educational partnerships that were well received and successful involved real empowerment, collaboration, and trust by all stakeholders, as well as shared power by the leadership. As identified earlier, these insights into the elements of successful school-university partnerships overlap with suggestions for successful OD and change efforts in a variety of organizational contexts (Cummings and Worley, 2001; Rothwell, Sullivan, & McLean, 1995).

Teacher Demand in the State of Texas

Because this paper focuses on a school-university partnership approach aimed at increasing teacher supply in the state of Texas, it is important to explore recent trends associated with statewide teacher employment. A mixture of economic, educational, and demographic factors have combined to create teacher shortages in a number of US cities and states. In recent years, the state of Texas has focused its energies on the clarification of the total statewide picture for teacher training, recruitment, and retention. Although often considered to be human resource management issues (McLagan, 1989), recruitment and retention have also been explored in the HRD literature (Bartlett, Egan, Ipe, & Kim, 2002; Bierema, 1999; Vann & Hinton, 1994).

In recent years, the supply of certified public school teachers has not met the demand. This shortage has been the result of a number of factors including lower numbers of certified teachers, growing school populations, and teacher turnover. At present, approximately one-forth of teachers in the state of Texas are not certified or are in the process of becoming certified while working as a full-time public school teacher (Institute for School-University Partnerships, 2002). Nationally, 22% of all new teachers leave the profession in the first 3 years because of lack of support and a ‘sink or swim’ approach to induction into the profession (US Department of Education, 2002) and 60 percent of Texas teachers quit the profession after the first five years of employment. The National Commission on Teaching and America's Future (1996) estimated that U.S. schools needed to employ more than 2 million new teachers from 1996-2006. This estimate may have been low. Demand is even higher for teacher specializations such as math, science, foreign language, bilingual, and special education are included as considerations.

Given these challenges, the state of Texas has engaged in several approaches aimed at improving teacher induction into the profession, providing effective training and certification, addressing teacher supply issues, and exploring effective approaches for increasing retention rates. One of these efforts is the Texas A&M University (TAMU) Regents’ Initiative. This effort has led to the formation of school-university partnerships aimed at comprehensive exploration and action to increase and maintain the numbers and quality of teachers in the state. It is important to note that no scholarly literature associated with teacher supply issues (the focus of the TAMU initiative) were identified in our review of literature. The following sections describe and report results from this TAMU system-wide initiative.

Case Study: The TAMU Regents’ Initiative

The following section explores the history, successes and challenges faced by the TAMU Regents Initiative which is school-university partnership aimed toward increasing supply, quality, and retention of public school teachers in Texas.

History of the Regents' Initiative

In March 1999 the Board of Regents of The Texas A&M University System unanimously passed a resolution establishing the Regents’ Initiative for Excellence in Education. With the passage of this resolution, the Regents became the first higher education governing board in Texas to formally call for renewed attention to this aspect of university programming. Through this action, the Board declared teacher preparation a priority of the A&M System, and advocated long-term, systemic improvements in both the quality and effectiveness of teacher education programs in A&M System universities. The resolution directed the Chancellor to establish measurable standards of excellence for A&M System teacher preparation programs, including production and performance targets. The Board also directed staff to report periodically to the Regents on institutional progress in achieving these goals.

In presenting this case study, it is important to outline the original purpose and rationale for this work within the A&M System. The Regents’ Initiative was undertaken in response to the rapid demographic changes occurring within the state’s population, and in particular, its public school system. Given the A&M System’s substantial interest in the long-term well-being of Texas public schools, as well as its traditional responsibility as one of the state’s leading providers of classroom teachers, the Regents were prompted to reemphasize the A&M System’s teacher preparation commitment.

At the time of passage of the Regents’ Initiative, A&M System universities, like most institutions of higher education in the state, were experiencing declines in teacher production. During the period from 1993-94 to 2000-
01, system-wide production of teachers decreased by over 14 percent. By the end of the 1999-2000 academic year, the A&M System universities were producing 300 fewer teachers compared to annual production rates of seven years prior. During this same time period, Texas public schools grew by over 400,000 students. Faced with such explosive growth and declining university production, Texas schools were experiencing significant shortages of certified teachers. The Initiative was undertaken in part to counter the declining pool of quality teachers, and to improve A&M System production to better meet the needs of its public school constituents.

The five-year goal of the Regents’ Initiative was to increase overall system-wide teacher production by 33 percent, including significant increases in the number of minority teachers and teachers in high-need teaching fields. The established five-year numerical targets were: African American Teachers—228; Hispanic Teachers—671; Bilingual/ESL Teachers—228; Special Education Teachers—433; Math Teachers—328; Science Teachers—514; and Foreign Language Teachers—88, and a total of 3,318 teachers.

In addition to their need for increased production, Texas schools were also faced with more challenging academic standards (in the form of the Texas Essential Knowledge and Skills test), as well as increasingly complex student populations. These academic and demographic changes clearly compel teacher preparation programs to assure that teacher products are better prepared and more accomplished than ever before. In this regard, the Regents’ Initiative has served as a vehicle for simultaneous improvement of the quality of teacher preparation experiences within the A&M System. As a means of continuous quality improvement, the system established performance benchmarks on the state’s teacher certification examination. In developing these program targets, the Chancellor afforded A&M System institutions with a five-year horizon (through January 2005) by which time all are expected to successfully achieve their respective goals. The data presented in this report covers the period from February 1999 (the actual launch date for implementation) through August 31, 2002.

The School-University Partnership Framework

The Regents’ Initiative is a performance-driven improvement model. The initiative focuses on a comprehensive set of 11 performance and/or production benchmarks which measure university progress simultaneously in increasing the quantity and quality of teachers. To achieve the Regents’ Standards for Excellence, institutions are expected to make exceptional progress in all target areas.

The Standards for Excellence and core strategies included in the Regents’ Initiative model provide a template for the type of institutional changes that will promote enhanced teacher quality and productivity.

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**Figure 1. The School-University Partnership Framework: Regents’ Initiative Model**

<table>
<thead>
<tr>
<th>Regents’ Initiative Core Strategies</th>
<th>Regents’ Standards for Excellence (Measures)</th>
</tr>
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<tbody>
<tr>
<td>Strengthening Regional Partnership Structures</td>
<td>Performance targets</td>
</tr>
<tr>
<td>Building teacher recruitment programs</td>
<td>Productivity targets</td>
</tr>
<tr>
<td>Creating community college partnerships</td>
<td>Resource targets</td>
</tr>
<tr>
<td>Engaging arts and sciences faculties</td>
<td>Leadership</td>
</tr>
<tr>
<td>Aligning curriculum standards</td>
<td>Instruction</td>
</tr>
<tr>
<td>Restructuring teacher education programs</td>
<td>Research</td>
</tr>
<tr>
<td>Collaborating on research and development</td>
<td>Faculty</td>
</tr>
<tr>
<td>Inducting new teachers</td>
<td></td>
</tr>
<tr>
<td>Enhancing teacher leadership and building new teacher relationships</td>
<td></td>
</tr>
</tbody>
</table>

Since each university’s success will ultimately depend upon its ability to integrate these core strategies during the Initiative, a significant portion of efforts has been devoted to building the essential organizational and leadership infrastructure for long-term success. The program model includes:
- A set of seven program standards for A&M System institutions (which includes productivity and performance targets that exceed the nominal standards required by the state), and
- A set of nine core strategies, to be implemented by each institution in order to achieve the performance standards.

The elements of the Regents’ Initiative model are depicted graphically in Figure 1.

The particular strategies incorporated in the Regents’ Initiative model came from the combined recommendations of a variety of system-wide PK-16 working groups such as the Council of School Executives, the Deans’ Working Group, and the Richardson Fellows for School-University Collaboration. Taken together, this constellation of nine core strategies comprises a long-term reform agenda for teacher preparation in the A&M...
System. These strategies, which complement each other, are being implemented simultaneously on a university system-wide basis in order to achieve the magnitude of improvement specified in the performance goals. The basic strategies associated with the Regents’ Initiative may be summarized as follows:

- Active executive engagement and leadership in local PK-16 Councils.
- Enhanced community college partnerships.
- Active recruiting of outstanding teacher candidates, coupled with increased scholarship and grant opportunities.
- Ongoing professional development for university faculty involved in teacher preparation.
- Expanded public school partnerships.
- Coaching and mentoring A&M System graduates as they move into the teaching profession.
- Expanded educational research opportunities.
- Aligned university admissions and academic standards with public school graduation and content standards.
- Leadership development for public school and university instructors.

The specific program standards for the Regents’ Initiative include the following production targets:

- Increase annual system-wide production of teachers by 33 percent, to approximately 3,300 teachers annually by 2005.
- Increase annual production of Hispanic and African-American teachers by 64 percent and 90 percent, respectively.
- Increase annual production of math, science and foreign language teachers by 250 percent.
- Increase annual production of special education and bilingual/ESL teachers by 170 percent.

In addition to increasing the number of certified teachers, institutions must also demonstrate increased student performance trends on state certification examinations by 2005. Specific performance standards to be met by each institution are:

- All teacher preparation programs within A&M System universities will meet or exceed minimum performance standards for each demographic subgroup established by the State Board for Educator Certification.
- The percentage of first-year test takers in each demographic subgroup who pass the state-licensing exam will increase by a minimum of 20 percent, or achieve and maintain a pass rate of 90 percent.

The Regents’ Initiative for Excellence in Education, which was established by resolution of The Texas A&M University System’s Board of Regents in March 1999, has begun to reflect tangible improvements at all nine A&M System universities and for partner schools hiring the teacher-participants in the Regents' Initiative affiliated schools.

Results

Over the initial three years of the Regents’ Initiative, system-wide production has increased. This increase marks the first annual increase in A&M System teacher production since the 1993-94 academic year. The total production went from 2,291 in the baseline year of 1999-2000 to 2,742 in 2001-02. This represents a 20-percent increase. Eight of the nine A&M System universities show positive trends in the production of teacher candidates from year 1-3. Of those, Prairie View A&M University has increased its production by 115 percent over the three years of the Initiative.

All nine A&M System universities have achieved 50 percent or more of their respective targets. Furthermore, eight universities have maintained positive trend lines throughout the duration of the Initiative. Three universities have already exceeded their five-year targets for total production. The A&M System has also increased its minority teacher production since the implementation of the Regents’ Initiative for Excellence in Education. Since implementation, the A&M System institutions have experienced a 116-percent increase in the number of African-American teachers produced. The A&M System has also seen a 17-percent increase in the number of Hispanic teacher candidates produced over the three years (Figure 9). The System produced 509 Hispanic teachers in 1999-2000; by 2001-02, annual production had increased to 595. The five-year target is 671.

During the first three years of the Initiative, A&M System institutions have increased total output of bilingual/English as a Second Language teachers by 84 percent. In 1999-2000, the total number of Bilingual/ESL teachers produced was 121; by 2001-02, annual production was increased to 223. Six of the nine A&M System universities have experienced an increase in production from Year 1 to Year 3. Three universities have significantly increased their percentage of ESL production over the three-year period. The A&M System has achieved 98 percent of its five-year goal of 228 in bilingual/English as a Second Language. Furthermore, four universities have exceeded their five-year goals for bilingual/English as a Second Language. Seven of nine A&M System institutions have increased the number of special education teachers produced from Year 1 to Year 3. Five universities have increased their production by over 100 percent over that three-year period. Production of foreign language teacher candidates
also has grown by one-third from Year 1 to Year 3. In 1999-2000, the A&M System universities produced 38 teacher candidates in this high-need area; by 2001-02, that number had increased to 50 candidates. The five-year target is 88. Four of nine universities have shown increases in production from Year 1 to Year 3.

Comparing Current Results to Reviewed Literature

The successful performance results to date of the Regents’ Initiative efforts to increase certified teacher education, employment and retention are closely associated with several elements in the school-university partnership literature. In comparing effective practices outlined in Table 1 to the case study explored here, the following practices have been observed: 1) visionary leadership; 2) willingness to promote change; 3) open and ongoing communication; 4) stable and detail-oriented project leadership; 5) adequate financial support; and 6) acknowledgement of collaboration success. The actions associated with the identified effective practices associated with the Regents’ Initiative are identified in Table 2 below.

Table 2. Effective practices utilized in the Regents’ Initiative

<table>
<thead>
<tr>
<th>Effective Practices Observed in the Current Initiative</th>
<th>Actions Associated with Effective Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visionary leadership</td>
<td>The Regents and university administration in collaboration with statewide schools identified the need and invested time, resources, and energy into an ambitious long-term plan aimed at moving the state in a positive direction. Such long-term plans are unusual and representative of vision and commitment by stakeholders.</td>
</tr>
<tr>
<td>Willingness to promote change</td>
<td>Regents, community/school leaders, and university leaders worked to effectively communicate and seek endorsement from key statewide stakeholders. Commitment was maintained throughout the stated</td>
</tr>
<tr>
<td>Open and ongoing communication</td>
<td>Communication between state, university, and school representatives continues regarding the reporting of progress and challenges</td>
</tr>
<tr>
<td>Stable and detail-oriented project leadership</td>
<td>The specificity of the Initiative and the steps needed to get there were well defined, achievable, and measurable. Central school-university partnership leaders were assigned to lead the project and were maintained over an extended period</td>
</tr>
<tr>
<td>Adequate financial support</td>
<td>Financial support for training, programs, administration, and retention efforts were provided to those implementing the Initiative</td>
</tr>
<tr>
<td>Acknowledgement of collaboration success</td>
<td>Regular reports, publicized newsletters, and public presentations to the Regents provided multiple streams for frequent acknowledgment of success.</td>
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</tbody>
</table>

Although all of the above effective practices have been observed as part of the Regents’ Initiative process, neither the literature supporting these categories, nor the current data available describing the case study under exploration provide information or measures associated with the degree to which these effective practices occur or could occur. Although our exploration of the outcomes associated with this case detail the aforementioned effective practices, space limitations for the current reporting format limit the detail we are able to provide. However, effective practices associated with available literature appear to be relevant and important to the achievement, thus far, of established performance goals. It is important to note that the school-university partnership dynamic is still emerging as schools and community colleges provide ongoing feedback to the TAMU system regarding the effectiveness of outputs associated with the Initiative.

Conclusion

Based on the descriptive findings, the TAMU Regents' Initiative is working successfully toward accomplishing the goals set forth within the context of the school-university partnership. Under the current available data great strides toward teacher induction into Texas public schools has occurred. However, many of the other elements associated with the reviewed literature and the comprehensive school-university partnership framework set forth by the Regents' Initiative remain unclear. Anecdotal data (not presented in this paper due to length restrictions) support that many of the effective practices identified in the literature are being demonstrated in the case study described here. Because the University Initiative has not yet completed its five year timeline, there is much more to be learned about this school-university partnership. However, because it is the first known comprehensive approach of its kind to address statewide teacher shortages, the model and the results are encouraging.
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