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BETTYE GRIGSBY

WINONA VESEY

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ASSESSMENT TRAINING IN PRINCIPAL PREPARATION PROGRAMS

BETTYE GRIGSBY

University of Houston-Clear Lake

WINONA VESEY

University of Houston-Clear Lake

The role of the administrator has evolved over the past 30 years from manager to instructional leader. As instructional leaders, administrators are now responsible for student achievement on high-stakes state-mandated assessments. Therefore, it is imperative principal preparation programs provide the necessary training instructional leaders need to analyze and interpret assessment data and make informed decisions toward school improvement. This descriptive study analyzes four syllabi components to determine the extent to which testing and measurement are covered in each course: objectives, classroom sessions, resources, and activities. Based on responses from 30 universities across the United States, less than 30% of principal preparation programs are preparing candidates to be data-driven decision-makers. The most frequently adopted textbooks provided practical applications, and respondents used a wide variety of activities that provided relevant data-driven experiences; however, less than 50% of respondents spent at least 19 hours on testing and measurement in a 45-hour semester. The researchers make recommendations principal preparation programs may include to increase data-driven decision-making experiences.

Keywords: principal preparation, data-driven decisions, assessment, school leaders

In today's era of accountability, the role of the principal has developed into one of an instructional leader (DiPaola & Hoy, 2008; McEwan, 2003). The charge to be leaders of instruction requires principals to understand the process of analyzing assessments (Hess & Kelly, n.d.). It is essential principals know how to use information from both classroom and state assessments alike, in order to drive student achievement and school improvement. Principals are responsible for supporting their teachers in using formative classroom assessments to improve student learning. Principals are also called to encourage their teachers in the use of summative end-of-year state assessments to highlight areas needing professional development and support.

Because of the great emphasis on continuous increased student achievement and school improvement, there is much debate as to whether principal preparation programs have stayed abreast of the changing demands of the field (Darling-Hammond, LaPointe, Meyerson, & Orr, 2007; Farkas, Johnson, & Duffett, 2003; Hess & Kelly, 2005b; Reeves & Burt, 2006).

In 2005, Levine rated principal preparation programs from inadequate to appalling following a four-year extensive study of institutions. His study consisted of a national survey of deans, chairs, directors, faculty, working principals, and alumni of education schools; 28 case studies of national school and departments of education; and a demographic report of institutions across the U.S., including, a review of their dissertations, the degrees awarded, and programs offered. Levine reported that 30% of school administrators stated their preparation programs did poor jobs of preparing them for handling test-based accountability systems. Given the fluidity of the principalship over the last 70 years, one might expect that principal preparation programs have stayed current with the changing demands in the field, but that does not appear to be the case (Levine, 2005). The purpose of the current study is to offer an update of the training offered by U.S. principal preparation programs and determine if that training has in fact kept up with the changing demands in the field. The researchers are specifically interested in training related to analyzing and interpreting assessment data to make informed decisions for the improvement of student performance on assessments. To that end, we pose the following research question: What training are United States principal preparation programs currently providing instructional leaders in the interpretation and analysis of assessment data

toward school improvement?

FRAMEWORK OF DATA-DRIVEN DECISION MAKING

The process of continuous school improvement may be accomplished through data-driven decision making (DDDM). DDDM is the collection, analysis, and reporting of student assessment data and relevant background information used to guide decisions related to the planning and implementing of instructional strategies in the classroom for individual students toward school improvement (AASA, 2002; Cradler, 2010). The progression towards sustaining continuous improvement utilizing DDDM is cyclic in nature (Boudett, City, & Murnane, 2006). It is imperative schools advance through and repeat the following four-step approach of DDDM in order to perpetuate school improvement.

Step One: Establish a Data Friendly Environment while Reviewing the School's Improvement Plan

Administrators and staff should collaboratively review the improvement plan to determine the need for and use of data collection (Williamson & Blackburn, 2009). Once the areas in need of improvement have been established, goals must be set to clearly define the school's direction (Flowers & Carpenter, 2009). As the collective group prioritizes the goals and works through this process, an environment establishing the importance of compiling and using data is created (Ellingsen, 2007). In order to further build a level of comfort during data collection, an administrator will want to help staff become literate in reading assessment reports (Boudett, City, & Murnane, 2006). Therefore, sessions to assist staff in becoming familiar with the various types of data, certain language utilized in data reports, and key concepts are essential to a better understanding.

Step Two: Data Collection

The usage of multiple data sources influences the quality of the data collected (Texas Education Agency, 2009). Therefore, a list of data sources that could be used to make informed decisions about the focus area should be generated. Once the data presently housed on the campus are located, the group will need to determine how the data can be used to meet the goals. For example, this could include walk-through reports, curriculum guides, lesson plans, and standardized test scores (Williamson & Blackburn, 2009). Additional data pertaining to the focus area may also be collected from teacher, parent, and student surveys.

Step Three: Examine and Discuss the Data

Administrators should engage staff in meaningful dialogue concerning what they see in the data. In-depth conversations surrounding the data can alleviate individual pre-determined notions about what the data show and will keep everyone focused on examining the results. Questions such as What do the data tell them? Is their school where they want it to be? What do the data not tell them? and What additional information is needed? should be considered during these candid conversations (Flowers & Carpenter, 2009). After analyzing data from each data source, patterns across sources may be observed (Williamson & Blackburn, 2009), after which a shared examination of campus instruction should ensue. A discussion of effective instructional practices along with assistance to staff in the examination of what is happening on the campus can be compared to the kind of effective instruction needed for continuous improvement (Boudett, City, & Murnane, 2009).

Step Four: Construct the Plan and Evaluate Progress

Develop short-term and long-term goals indicating where the campus would like to be in the area of concern within the next 1-5 years. When creating the action plan, administrators and staff should ascertain what resources are available to help reach the goals, select strategies that will lead to achieving the campus needs, and identify professional development activities necessary to provide support in the implementation of the strategies (Boudett, City, & Murnane, 2006; Flowers & Carpenter, 2009). Finally, consider how progress will be measured. Formative and summative evaluations should occur throughout the year to assess any successes or deficiencies of the plan that need to be addressed.



LITERATURE REVIEW

For decades, classroom instruction has relied on the skills and expertise of university faculty to determine strategies most effective when teaching students, rather than relying on data-driven practices (Picciano, 2006). With the passage of the No Child Left Behind Act of 2001 (NCLB), principals are held accountable and expected to use assessment data when making decisions toward improved student achievement (Mandinach & Honey, 2008). Furthermore, NCLB "requires states to develop tests to assess student achievement so data-driven decisions become an integral part of the educational system" (Yell & Drasgow, 2005, p. 1).

The use of data furnishes principals with valuable information regarding the strengths and areas of concern for students, the curriculum, instructional practices, and resources (Sindelar, 2006). Principals are no longer just considered managers of the building; they must also be data analysts. However, Creighton (2005) cautions principals to take more than a superficial look at data to ensure all students are receiving equitable, rigorous, and appropriate instruction.

Dimensions of Data-Driven Decision-Making Principals

The Ontario Principals' Council (2009) denotes three dimensions of a data-driven principal: leader, professional developer, and communicator. As a leader, it is imperative the principal have a vision of how the school will use data in decision making for school improvement. The instructional leader is obligated to show the effectiveness of DDDM and explain how it is accomplished. A successful DDDM leader has an understanding of sound assessment processes and possesses data analysis skills which he or she applies in efforts to develop a campus plan towards improved teaching and learning (Thornton & Perreault, 2002; Stiggins & Duke, 2008). Incorporating numerous formative assessment opportunities throughout the implementation of the plan is crucial when determining areas of success and concern (Ontario Principals' Council, 2009).

To be an effective DDDM leader, principals must also use data to identify teachers' professional development needs. Research indicates that effective schools typically use data to guide instruction (Protheroe, 2009). Modeling data usage and allocating time for data reflection by the instructional leader are essential for DDDM to impact school improvement (U.S. Department of Education, 2009). Therefore, the instructional leader in DDDM should act as the lead professional developer by establishing a supportive learning environment for faculty and providing assistance to build skills and knowledge in the areas of need identified by the data (Ontario Principals' Council, 2009). According to Waddell and Lee (2008), the DDDM leader should demonstrate the use of data and communicating results when planning. The principal could use data to examine current instructional practices and shift the mindset of faculty from isolation to collaborative data-driven practice, whereas, dialogue could provide a forum for engaging faculty in meaningful discussions culminating in the development and implementation of a campus plan for improved teaching and learning (Waddell & Lee, 2008). Guiding faculty through a data analysis exercise can begin the data and dialogue process.

The final dimension of a DDDM principal is communication. In order for school improvement to be successful, purposeful communication cannot be underestimated (Zepeda, 2004). Communication is an essential behavior to promoting understanding (Cooke, 2007). Effective leaders are compelled to constantly seek and implement strategies to enhance the dissemination of data to parents, teachers, and the community at large (Knuth, 2006). Leaders as communicators should constantly share in a clear and concise manner how data are being used to develop and evaluate the campus improvement plan (Ontario Principals' Council, 2009). The principal acting as leader, professional developer, and communicator is the one who ultimately provides the necessary instructional leadership, tools, and resources to ensure faculty are effective in the classroom (George, 2002).

In summary, when DDDM is used appropriately, the following scenarios occur on the campus:

- Staff development becomes focused on improvement strategies to address concerns identified by data;

- Budget allocations are based on data-informed needs;
- Staff assignments are based on skills needed, as indicated by the data;
- Reports to the community are about the learning progress of students;
- Determining goals for improvement is guided by data;
- Staff meetings are focused on developing strategies to remedy concerns indicated by the data;
- Specific data regarding their child's performance are regularly communicated to parents;
- Common grading systems indicating student performance are developed in order to monitor progress on the standards; and
- Administrative team meetings are focused on discussions of measured progress toward data-based improvement goals. (Technology Alliance, 2010, para. 2)

Principal Preparation Programs

A substantial barrier to principals successfully implementing DDDM is the lack of applicable training (U.S. Department of Education, 2009). Expecting principals to support their teachers' use of test data is impractical if principals have not received proper training and do not understand using assessments for learning (Stiggins & Duke, 2008).

One form of training is through principal preparation programs that provide instructional leaders with the knowledge, skills, and attributes needed to analyze and interpret assessment data to make informed decisions towards improved student achievement. According to the Southern Regional Education Board (2005), "traditional models of training provided to school principals are still out of sync with the challenges faced by today's leaders" (p. 3). As a result, principal preparation programs have been under scrutiny for several years now, with numerous studies documenting the ill-preparedness (Archer, 2005; Azzam, 2005; Hess & Kelly, 2005a). Most of these studies have evaluated principal preparation programs as a whole and have not devoted specific attention to the area of DDDM (Hess & Kelly, 2005b). In 2003, 67% of principals felt leadership training in schools of education did not prepare them for their roles as instructional leaders (Farkas, Johnson, & Duffett, 2003). In a study conducted by Reeves and Burt (2006), principals specifically stated that their principal preparation programs did not equip them with adequate strategies to analyze data. In 2007, 69% of principals shared the same sentiment (Darling-Hammond et al., 2007). As a result, clear and consistent standards for principal preparation programs have been developed to assist in specifying parameters for the "ever-changing" job description of instructional leaders (CCSSO, 2008).

Standards are the foundation that can set expectations and guide improvement of each element of principal preparation programs. The Educational Leadership Constituent Council (ELCC) and the Interstate School Leaders Licensure Consortium (ISLLC) provide standards that support DDDM. Standards one through four indicate that an instructional leader must be able to collect, organize, and analyze student performance data to make recommendations regarding the design, implementation, and evaluation of curriculum to optimize the learning environment for all students (CCSSO, 2008; ELCC, 2002).

Martin and Papa (2008) indicate that principal preparation programs place too much emphasis on class lectures and theory and not enough on application. Therefore, it is prudent that principal preparation programs become more innovative and include intensively focused components and authentic coursework and field experiences (Orr, 2006). In order for a principal preparation program to be effective, a partnership between universities and school districts must exist to offer students collaborative real-world classroom training (Martin & Papa, 2008). One indicator of the effectiveness of principal preparation programs is to examine the guide for expectations: the course syllabi.



Components of Course Syllabi

A syllabus is considered an outline and summary of topics covered, which includes required resources, a list of activities, and the instructional calendar of a course. While the syllabus does not provide detailed information on what actually occurs in the classroom, it does reveal the course's "structure and design" (Hess & Kelly, 2005b). Therefore, a further look at four components of the syllabi will be examined in this study: course objectives, classroom sessions, resources, and activities.

Course objectives. Course objectives are intended to communicate expected instructional outcomes. They are descriptions of what learners should be able to exhibit upon successful completion of the course (Winegarden, 2011). Course objectives provide an understanding of what is expected during the lesson and focus the learner and instructor. Objectives should be specific, observable, and measurable, and place an emphasis on major points (Waller, 2011). Objectives should include explicit wording describing what skills or knowledge are to be achieved, under what conditions the behavior occurs, and how well the action has been accomplished (DeSilets, 2007). Well written objectives are not open for interpretation. There are three common errors encountered when writing course objectives. First, the objective may be written too broadly and encompass several objectives. Secondly, the behavior or condition is incorrect or missing. Lastly, the behavior that must be observed is absent (Bixler, 2006).

Classroom sessions. According to the California Center for Effective Schools (2011), essential characteristics that provide a framework for effective schools are known as the Correlates of Effective Schools. One of the guiding principles of the effective schools' correlate focuses on the opportunity to learn and student time on task (Lezotte, 2004; Texas Education Agency, 2009). Research has shown that a significant amount of time allocated to instruction on a particular objective increases learning (California Center for Effective Schools, 2011); therefore, increasing the amount of time a student is working increases the learning (Wong & Wong, 2005). As a result, having students actively engaged across activities and interactive instruction influences increased overall comprehension and retention.

Resources. University courses are supported by textbooks produced for specific course content. A textbook is considered an essential tool that provides support for student learning (Horsley, Knight, & Huntly, 2010). Textbooks are chosen by instructors for college courses to allow a student to receive a "good grasp" on the subject matter from scholars within the academic community (King, 2011). As candidates become administrators, it behooves them to develop a personal professional library consisting of college and other texts that can be used for future reference, since teachers may rely on the principal for assistance in various campus matters. The careful selection of a textbook reflects the history, understandings, and best practices utilized within a discipline by the academic community (Horsley, Knight, & Huntly, 2010).

Activities. Learning is an active process (Starke, 2011). An instructional strategy used to engage students in the learning process is considered active learning (Prince, 2004). Active learning promotes critical thinking skills by allowing candidates to participate in the instructional process through such modalities as presentation, writing exercises, discussion, problem solving, analysis, synthesis, and evaluation (Cojanu, Gibson, & Pettine, 2010). Varying activities allows students to be actively engaged with the course material, facilitates interaction among and between the candidates and professor, and revitalizes the course by providing a change of pace (Center for Teaching Excellence, 2011, para. 1).

METHODOLOGY

Participants

Participants included educational leadership professors from the top 10 education schools in 2008 (U.S. News & World Report, 2008) and a random sample of 30 representative education schools across the U.S., for a total of 40 schools. From these schools, graduate level professors teaching courses in an educational administration program were surveyed. Data collection resulted in information from approximately 60 professors across 30 different universities, which resulted in a 75% response rate.

Instrumentation

Professors were asked to complete a five-question survey instrument over the phone or via the Internet, as well as submit their most recent syllabus for courses focused on assessment/testing and data-driven decisions. The survey instrument was used to confirm and supplement the information gathered from course syllabi. The questionnaire items were piloted with five schools one week prior to launching the survey instrument (see the Appendix for the survey instrument items). Items were revised for clarity as a result of feedback from the pilot administration.

Design and Procedure

A quantitative descriptive design was used to address the research question. After the schools were selected, our first data collection attempt was communicated via e-mail. Participants were given the background of the study and asked to complete an online questionnaire. The online instrument also asked each respondent to submit their syllabus. Two follow-up e-mail contacts were made with each professor. After the second failed follow-up attempt, a phone call was made to communicate the background of the study and to collect questionnaire responses. Last attempt phone calls were made up to three weeks after the initial e-mail.

Data collection included an exhaustive list of textbooks resulting from the submitted syllabi and questionnaire responses. The most frequently referenced textbooks were then reviewed in detail. The number of classroom sessions dedicated to assessment or testing was determined by a review of syllabus and questionnaire responses for key words related to testing. Course objectives and activities were also reviewed for key words related to assessment. If an entire class period was dedicated to testing or assessment, then three hours (or the length of that class) was awarded for the topic. Course percentages were then calculated based on a 45-hour semester. As an example, if two class sessions were allocated for test and measurement in a course that met once a week (three hours each session), 13% of the time in that course was allocated to test and measurement.

Analysis of Data

Data analysis consisted of coding syllabi and questionnaire responses for the use of the terms assessment or testing, the amount of class time spent on the topic, textbooks and supplemental material related to testing, the mention of student assessment, data-driven decision-making, and high-stakes testing. As a result of the coding, courses were rated as either inadequate or adequate. Courses rated as adequate demonstrated evidence of data-driven decision-making and testing in the syllabus. Respondents used textbooks that provided realistic activities for students to practice and gain experience with data-driven decision-making, and 50% or more of their time (based on a 45-hour semester) was spent on assessment issues, such as the interpretation of data and/or using data to make informed decisions to improve student achievement. Syllabi rated as inadequate allocated less than half of the course time to assessment issues and did not utilize textbooks or supplemental material for practical applications, but may have made mention of data-driven decision making and testing in the syllabus.

RESULTS

Four areas in the syllabi were evaluated to determine the extent to which testing and measurement was covered in each course: objectives, classroom sessions, resources, and activities. Each course component provided insight into how the course allocated time and what resources were utilized towards teaching DDDM.

Objectives

The objectives of each syllabus were examined to determine whether the course offered any form of instruction on testing and measurement. Based on the syllabi from respondents, 50% of the 60 courses surveyed were required courses that pertain to some aspect of testing and measurement. Terms such as analyze data, improve student performance, effective use of data, analysis in making decisions regarding school improvements, and educational testing were used when stating the objectives. Further analysis of each syllabus revealed that 25% of the 30 courses



had objectives directly related to data and decision-making. Additionally, written responses to item one of the questionnaire included students gaining capacity in knowing and using a range of assessments, being introduced to the theoretical and practical foundation in assessment, and understanding the role of state assessment in curriculum design.

Classroom Sessions

In this study, the majority of 30 courses spent between 19 and 30 hours on testing and measurement within a 45-hour semester. Their sessions on testing and measurement were blended throughout the course (see Figure 1).

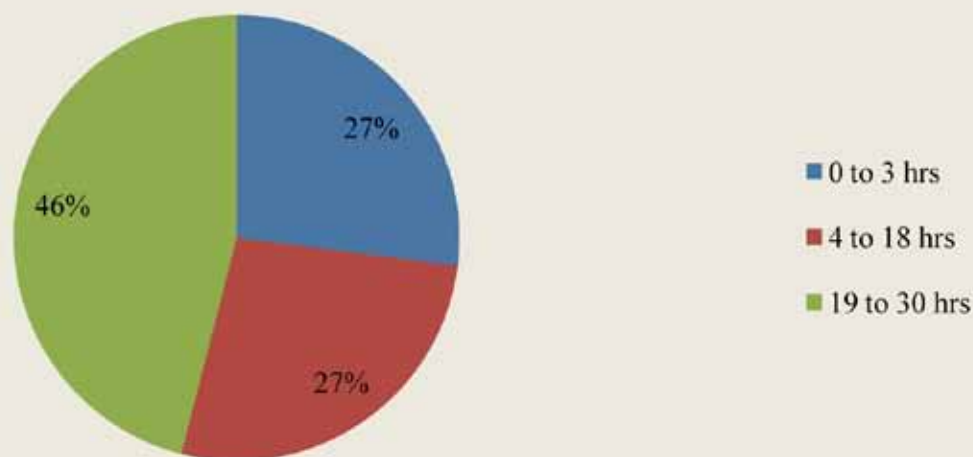


Figure 1. Percentage of Courses and Time Spent on Testing and Measurement (n = 30)

Resources

Respondents in this study selected a variety of textbooks. The most frequently adopted texts are listed in Table 1.

Activities

Respondents in this study used a variety of activities to teach testing and measurement. Activities included data team assignments, school assessment inventory, evaluation of a state adopted standardized test, designing a comprehensive assessment plan, review of Education Week articles on using test data to evaluate teachers, small group discussion/review of performance assessment materials, and in-class standard-setting activities.

IMPLICATIONS

Course Objectives

Instructors develop objectives to clarify and communicate the purpose and intent of instruction for themselves and students (Kizlik, 2010). At first glance, the objectives stated in the syllabi provide candidates with an opportunity to become proficient in analyzing data from multiple assessments toward school improvement. The terminology used in the syllabi gives the appearance that the courses sufficiently incorporated lessons that developed the knowledge base needed to utilize testing and measurement toward school improvement. However, when respondents answered question one of the survey instrument, they were more descriptive in explaining the focus of the course. These

Table 1
Frequently Used Textbooks

Author	Date	Title	Explanation
Bernhardt, V.	2007	Translating data into information to improve teaching and learning.	Provides case studies to help administrators select data tools to support DDDM by creating reports that allow quality analysis. Administrators move from just having data to actually using data for improved teaching and learning.
Bernhardt, V.	2004	Data analysis for continuous school improvement	Provides clear and concrete examples from both elementary and secondary schools of what data to collect and how to use the data for school improvement in teaching and learning.
Boudett, K. P. City, E. A. Mumame, R.J.	2005	Data wise: A step-by-step guide to using assessment results to improve teaching and learning.	Introduces a blueprint administrators can follow when implementing data use on a campus by examining test scores and other classroom data that stimulate schoolwide conversations about teaching, learning, and school improvement.
Boudett, K. P. Steele, J. L.	2007	Data wise in action: Stories of schools using data to improve teaching and learning.	Highlights eight cases of schools using the Data Wise system in order for candidates to learn specific practical applications of each step in the process.
Carroll, S.R. Carroll, D. J.	2002	Statistics made simple for school leaders.	Presents a simple, practical, conceptual, and immediate applicable manner in which administrators can use statistics to manage data that results in an action plan for teaching, learning, and school improvement.
Popham, W. J.	2006	Assessment for educational leaders	Uses real world practical assessment related examples and scenarios for administrators to understand how to use assessment results toward improved teaching, learning, and school improvement

responses were more knowledge- and theoretical-based than practical application of testing and measurement. This leads one to believe that the instructors were actually writing goals that were general and non-specific and labeling these as objectives, which are more specific (Waller, 2011). This leads back to the three issues encountered



as instructors develop course objectives. As a result, if the researchers base their conclusions solely on the objectives reported, it is difficult to determine if the courses indeed provided candidates with the framework of DDDM, as well as the knowledge of how to interpret the data for school improvement. The stated objectives on the syllabi indicate candidates are taught to interpret and analyze data, but the respondents' written responses lean more toward theory-based instruction of testing and measurement. Therefore, a review of the course objectives alone will not provide a clear picture of whether data analysis is actually being taught throughout the course. Examination of the number of classroom sessions, resources, and activities is necessary.

Classroom Sessions

The amount of time spent in class on a concept is directly related to the importance placed on the topic (Johns, Crowley, & Guetzloe, 2008). Allocated time is the amount of time an instructor provides a student with instruction each class session. The longer the instructional time devoted to testing and measurement, the more a student will understand and be able to interpret state assessment data toward school improvement (Johns et al., 2008).

About one-fourth of the courses surveyed spent at least 7% of the semester on any type of testing and measurement. This equates to one class session and indicates that the candidates in these particular courses were not afforded multiple opportunities to learn, comprehend, and apply concepts of testing and measurement for an extended period of time.

About another fourth (i.e., 27%) of the respondents devoted anywhere from 9% to 40% of class time on testing and measurement, which means one-and-a-half to six class sessions included instruction and/or practice pertaining to testing and measurement. This indicates that candidates in these courses were given multiple opportunities to learn testing and measurement concepts with possibilities for comprehension. Full comprehension and application of these concepts possibly occurred in courses that spent upwards of 40% of the time on testing and measurement.

About half of the courses surveyed spent from 42% to 67% of the time on testing and measurement. As a result, 6.5 to 10 sessions dealt with some form of testing and measurement. Based on responses from item two of the questionnaire, testing and measurement was integrated throughout these courses. This indicates that numerous opportunities were provided for candidates to fully learn, comprehend, and apply testing and measurement concepts toward school improvement.

Resources

Resources used in course preparation for candidates to develop skills and knowledge about testing and measurement for school improvement are crucial to learning. Content learned is expected to help students in their understanding and development of the necessary skills to effectively analyze data and determine solutions for school improvement. The common idea presented in each text used in the surveyed courses was a practical step-by-step guide to analyzing and interpreting data that leads administrators toward school improvement and student achievement. Some textbooks focused on detailed action plans, while others identified the variables to consider when collecting data to inform decision-making, and still other textbooks focused on how to create useful reports for teachers. The majority of texts adopted utilized strong application processes toward testing and measurement. This leads the researchers to conclude that the texts used in the courses are sufficient.

Activities

Meaningful activities that will enable students to internalize and develop the skills needed to effectively analyze data from testing are important. Planning various activities to facilitate learning is the key to a candidate gaining better insight into the objective. Activities should be aligned with course objectives and geared toward various learning styles (Stewart, 2004).

The variety of activities listed in the syllabi provides numerous opportunities for candidates to apply concepts of testing and measurement toward school improvement. Each activity must be meaningful, engaging, and thought

provoking. The in-class activities of disaggregating data to conduct analysis of student sub-groups are used to begin conversations in which candidates identify student achievement issues. Field-based activities include candidates gathering additional instructional artifacts through curriculum documents, classroom assessments, interviews, and classroom observations to diagnose potential instructional issues that clarify the achievement issues noted from the initial assessment data.

Study Limitations

Syllabi are only a snapshot of what is occurring in the classroom. To further explore preparation programs, future research could include classroom observations and individual interviews.

The responding schools may represent principal preparation programs seeking to provide data-driven instruction that offers more practical experiences when training candidates in analyzing assessment data; results may not represent the average preparation program.

RECOMMENDATIONS FOR PRINCIPAL PREPARATION PROGRAMS

1. Align professional standards with each course in the program by developing a new curriculum framework and new courses aimed at producing leaders who can collect, interpret, and analyze school data focusing on continuous school improvement (SREB, 2005).
2. Provide more authentic coursework and field experiences in all courses that pertain to data analysis and informed decision making for improved student achievement. For example, in a graduate curriculum course, have students analyze performance data from their campus and make recommendations for improvements. In a graduate statistics course, teach candidates to "improve skills in problem analysis, program and student evaluation, data-base decision-making, and report preparation" (Creighton, 2001, p. 53).
3. Provide leadership academies for students once they become principals. This provides continuous professional development for students in the area of data analysis and informed decision-making.
4. Develop partnerships between universities and local school districts in order for candidates to experience hands-on activities in which investigation of assessment data are used and candidates work to find solutions.

SUMMARY

The results of this study were mixed. Course goals and objectives, when assessed independently, appear promising in terms of what students are expected to know and be able to do. However, the authors believe that the time spent on DDDM is the defining characteristic of an adequate course. If a course has all of the expected goals and objectives, but does not allow its students sufficient time to internalize and gain understanding, then its objectives will not be met. Although time spent on testing and measurement appears to be increasing for half of the courses, the instructors of other courses should re-evaluate their allocated time so more analysis of testing and measurement can be incorporated throughout the course. The data suggest that the texts and activities being used in these courses were sufficient. However, without knowing the process candidates use when completing the activities and reading the text, it is difficult to determine, conclusively, if candidates are truly developing the skills necessary to effectively analyze data and use this information for school improvement.

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APPENDIX

Principal Preparation Program Questionnaire

1. What goals/objectives in your course refer to any aspect of testing and measurement?
2. List the topic(s) covered in your course that identifies with testing and measurement as it relates to classroom assessment and the interpretation of state mandated data.
3. How many classroom sessions are spent on testing and measurement as it relates to classroom assessment and/or the interpretation of state mandated test data?
4. What resources (textbooks, articles, etc.) are used to support testing and measurement in your course?
5. What activities are used in your course to teach the topic(s) on testing and measurement?

Bettye Grigsby (GrigsbyB@uhcl.edu) has a Ph.D. from Texas A&M University. She is currently an Assistant Professor of Educational Leadership at the University of Houston-Clear Lake. Her experience in the field of education has been as a classroom teacher, administrator, and consultant. Grigsby has worked with school districts providing professional development to support them in improving instruction for all students, and she has presented at national conferences on issues related to educational administration and principal preparation programs. Her research interests are multicultural education, administrators as curriculum leaders, and the education of African American Male students. She has published on school community relations and leadership mentoring.

Winona Vesey (burtwm@uhcl.edu) completed her Ph.D. in Educational Psychology, Quantitative Methods at The University of Texas at Austin. She is currently an Assistant Professor of Quantitative Methods in the School of Education at the University of Houston, Clear Lake. She specializes in applied statistics, testing, standard setting, and high school reform. She is currently developing instructional materials in educational measurement and statistics for K-12 teachers and administrators.