Chapter 33
Implementing the Understanding by Design Framework in Higher Education

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ABSTRACT

This chapter describes an organizational initiative to develop and implement the Understanding by Design (UbD) curriculum-planning framework to improve learning outcomes for teacher candidates and their students during clinical experiences and in their future classrooms. This case study explores a pedagogical approach that has met with success in working with teacher candidates. The focus is on a narrow range of knowledge, skills, and dispositions related to effective teaching in science education: the ability to design, plan, and implement curriculum. Curriculum design using the Understanding by Design (UbD) Framework is a high priority when moving from simply covering subject matter to ensuring deep understanding. Using "Backward Design" helped many teacher candidates develop skills to plan effective science curriculum, units, and lessons. The experiences of two teacher education programs in building teacher candidates' skills in planning and implementing science education curriculum using the UbD Framework are presented in this case study.

ORGANIZATION BACKGROUND

Colleges and universities, in responding to political, social, economic, and technological pressures, are becoming more responsive to teacher candidates' needs and are more concerned about how well they are being prepared to assume future roles as teachers. Faculty are feeling the pressure to change their teaching strategies by developing rigorous curriculum, lecturing less, making learning environments more interactive, integrating technology into the classroom, and us-

ing collaborative learning strategies. This chapter describes two institutions of higher education and their experiences in scaffolding teacher candidates regarding the use of UbD as a framework for unit and lesson planning, including assessment.

These urban institutions are identified as University A and University B. University A, a Historically Black College/University (HBCU), is located in the southern part of the United States and has a long tradition of educating students who have been historically underrepresented. The mission of University A is to build a cadre of graduates who are prepared to conduct scholarly inquiry and research, become life-long learners, and are committed to service. Currently, University A offers bachelor's degree programs, master's programs, and awards doctoral degrees in several disciplines. University A is comprised of eight colleges and schools. The program for preparing teachers, at University A, is located within the College of Education. The program prepares teachers for elementary and secondary classrooms in specific content areas including science. Education faculty teach courses in programs, such as: curriculum and instruction, special education, reading, science education, and math education. Content area specialization for majors in secondary area is provided by faculty in different colleges and schools, including: math, science, history, humanities, music, art, and physical education. Students enrolled in the teacher certification programs take traditional courses to prepare them to design curriculum, develop assessments, engage all learners, and become reflective practitioners. In terms of professional development, University A faculty in the education department do not have access to funds to support attendance at conferences or bring well-known educational researchers and experts to the campus.

University B is a four-year, co-educational private liberal arts college. The institution moved to its current location in 1927 to serve young women who would otherwise be unable to obtain a college degree. While University B has evolved to meet the changing needs of its students throughout its 86-year history in the city, the institution has remained committed to the city and to the education of those disadvantaged by gender, race, economic circumstances, or social limitations. The mission of University B is to educate each student to become intellectually and professionally competent; ensure career flexibility through grounding in the liberal arts; and develop active compassion and commitment. Through excellent teaching in its undergraduate, graduate, and continuing education programs, the university provides a personalized learning environment for its students. The Institution, in an open, caring, nurturing, and friendly environment, provides learning experiences and opportunities for students to demonstrate leadership and develop confidence and self-reliance. The individual and collective excellence for which University B stands will continue to be measured by the quality of its graduates and their successes in serving society.

The Education Department of University B offers undergraduate and graduate programs to prepare students for careers as certified teachers at both the elementary and secondary levels. Perhaps no program at University B has focused more directly on the commitment to enabling positive change than the teacher certification program. Like most small, private liberal arts colleges, teacher training has been a curricular centerpiece, graduating students who staffed and led schools in the city, throughout the metropolitan area, and in many other states. Teachers from University B continue the legacy of service and leadership. University B is committed to professional development, with faculty receiving financial support to attend conferences and workshops. In addition, the Education Department hosts an annual conference that brings nationally known researchers and educators to the campus.

This chapter presents the Understanding by Design (UbD) Framework and its use in preparing teacher candidates in science and other curricular areas. In this framework, learning is about the

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