Using Technology to Deliver a Satellite Dental Program That Will Expand Access to Oral Healthcare While Maximizing Existing Resources

Gadbury-Amyot CC, Branson BG, Ahmed A, Pyle MA

2016 ADEA CCI Liaisons Summer Meeting, New Orleans, LA

ABSTRACT

Research supports the fact that professional students are more likely to remain in communities where they have obtained their education and training. Technology presents us with the ability to be innovative and creative in the way that we deliver dental education. The University of Missouri-Kansas City School of Dentistry has conducted a feasibility study around the idea of establishing a Doctor of Dental Surgery *satellite program* that will extend access to care in a region of the state that faces disparities in oral health access. While many dental schools are turning to *satellite clinics* to expand the educational boundaries and experiences of students, this proposal suggests a model whereby an entire existing Doctor of Dental Surgery *program* can be extended to a new location. With shrinking state budgets and calls for change in dental education, simply building new dental schools and continuing to do business the way we always have operated is no longer feasible or efficient. Collaboration with an existing university at the proposed location will allow for a synergy and pooling of resources for ensuring the success of this project. An onsite clinic for the *satellite program* will be located on the campus of the collaborating university and used for conducting the hands-on aspects of training of dental students. Tapping into existing resources at the home institution, such as faculty who are able to deliver coursework remotely via technology will go a long way in eliminating the need for duplication. Additional resources from the home institution such as, student affairs professionals, faculty development and other infrastructure needed to maintain a professional education program would be utilized.

INTRODUCTION

Sixteen years following the release of the first ever Surgeon General's report on oral health, access to oral health care continues to be a challenge for many segments of the U.S. population.[1] A variety of factors contribute to this problem including socio-economic status, ethnicity, age, educational attainment, geographic location, to name a few.[1-3] Compounding this problem are shortages of dentist providers. The Health Resources and Services Administration (HRSA), estimates a national shortage of approximately 15,600 dentists in 2025.[4] Dental education has responded by enacting a variety of changes including the incorporation of community health clinical experiences for students so that they can gain experience interacting and interfacing with these issues first hand.[5] Other solutions advocate for new dental schools in states and regions where the supply of new dentists is currently limited.[6-7] However, the idea of establishing new institutions in an environment of shrinking state budgets and support for higher education, along with the lack of other funding sources, makes the goal of new dental schools unattainable in many areas of the country. It is within this milieu that this project proposes a more innovative, collaborative, and economical approach for addressing access to oral healthcare and workforce shortage issues by extending an existing accredited dental program to a documented area of need within the state. While many dental programs have incorporated satellite clinics[1], this proposal suggests a *full satellite campus of a DDS program* – a concept that is novel in the United States.

METHODS

A collaborating *distance site* institution which consists of a state university geographically located in a rural area of the state approximately 160 miles from the *host site institution* was identified. The host institution and the distant institution have previous experience with academic collaborations using distance technology solutions.

A feasibility study was conducted to determine the viability and potential impacts of the proposed project. The scope of the study included a market analysis, organizational and technical analysis, and financial analysis.

Market Analysis

The following areas were studied and analyzed using Porter's Five Forces Framework:

- Applicant market within a 150 mile radius area of the distance institution site
- Professional organizations representing dentistry in the four state area
- Local practitioners near to the distance institution site
- Local business community
- UMKC faculty
- Other UMKC programs with satellite campuses

Organizational and Technical Analysis

An iterative approach was used to analyze the co-dependency of under-lying factors. These factors included:

- Baseline class size
- Staffing requirements for technology, teaching, clinical and laboratory support
- Space and equipment requirements
- Supplies and materials costs

Financial Analysis

Typical startup cost analysis included:

- Reserve for salaries and benefits
- Facility costs
- Equipment costs
- Lease costs
- Audio-visual transmission costs

Table 1: Dental health professional shortage area designation of the counties in the study area

State	HPSA Code - Dentists (2010)		
	The whole county was designated as a shortage area n (%)	One or more parts of the county were designated as a shortage area n (%)	None of the county was designated as a shortage area n (%)
Arkansas (n=22)	0 (0.0%)	3 (13.6%)	19 (86.4%)
Kansas (n=33)	7 (21.2%)	22 (66.7%)	4 (12.1%)
Missouri (n=44)	7 (15.9%)	28 (63.6%)	9 (20.5%)
Oklahoma (n=27)	2 (7.4%)	24 (88.9%)	1 (3.7%)
TOTAL (N=126)	16 (12.7%)	77 (61.1%)	33 (26.2%)

RESULTS

MARKET ANALYSIS

The market study area of a 150 mile radius area around the distance institution site constitutes 126 counties. The majority of counties (73.8%) were designated as partial or full dental health professional shortage areas (Table 1). The Missouri Department of Health and Senior Services estimates that currently 286 dentists are needed to meet the needs of residents.[10]

Figure 1: Collaborations sought for success

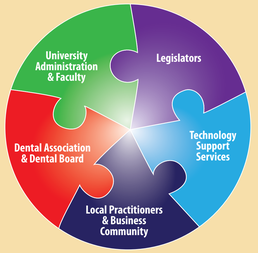
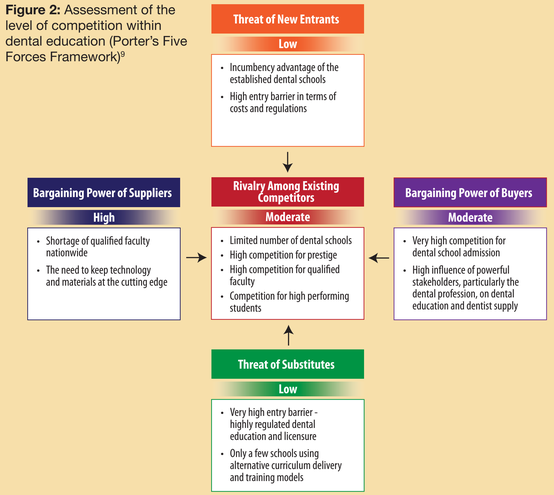


Figure 2: Assessment of the level of competition within dental education (Porter's Five Forces Framework)[9]



RESULTS (continued)

ORGANIZATIONAL AND TECHNICAL ANALYSIS

Capacity and Personnel Requirements/Space and Equipment Requirements

Capacity and personnel requirements were determined using an iterative approach and it was determined that a class size of 15 would be adequate given concerns of stakeholders and structural requirements. A 15-student solution can be accommodated in an available space at the distance institution, thereby negating the need for building a new facility or finding a building in the vicinity that could be leased. Existing SOD workload policies were used to develop staffing requirements. A key consideration was to mirror the curriculum of the host/existing DDS program.

FINANCIAL ANALYSIS

Given the nature of the project (a subsidiary of a state institution) and the high likelihood of using leased physical facilities, the startup costs were estimated using three cost categories: laboratory and clinic equipment, mobile simulator package, and audiovisual equipment. With a class of 15 it was determined there would be an operating surplus in year 4 of operations and would require 18 years to break even when startup costs and operating deficits in the first three years were taken into account.

DISCUSSION AND CONCLUSION

Comprehensive analysis of new, innovative projects requires careful due diligence to discover and analyze potential upside and downside scenarios in the assessment of project potential. Even with the projected cost savings that would result from the proposed satellite model versus building a new dental school, the economics surrounding this venture remain unresolved. While both the *host* and the *distance* institution are confident in their ability to see this vision become a reality, there are many factors that must fall into place in order to bring this to fruition. From the start the UMKC SOD administration and faculty have been adamant about ensuring the integrity of the *host* dental program and making sure that this initiative will not jeopardize the existing program in any manner. Therefore, the UMKC SOD has resolved that the necessary funding to fully support this initiative must be in place prior to advancing with a *satellite* dental program.

Finding creative and innovative ways to address the lack of access to oral healthcare should be a primary initiative of all entities involved in the education of our future dental healthcare workforce. The impact of poor oral health on overall health cannot be overstated. With news reports such as those involving the death of 12-year-old Deamonte Driver, and Kyle Willis a 24-year-old single father who both died from a tooth infections that spread to the brain, dentistry must be part of the solution. While no one solution is going to solve our current dental care delivery system, this study sought to explore one strategy for tapping into existing resources and maximizing efforts for the education of additional dentists.

REFERENCES

1. Field MJ, ed. Dental education at the crossroads: challenges and changes. An Institute of Medicine Report. Washington, DC: National Academies Press, 1995.
2. Dye BA, Tan S, Smith V, Lewis BG, Barker LK, Thornton-Evans G, et al. Trends in oral health status: United States, 1988-1994 and 1999-2004: National Center for Health Statistics. Vital Health Stat 11(248). 2007.
3. Bloom B. Oral health status and access to oral health care for U.S. adults aged 18-64: National Health Interview Survey, 2008. Vital and health statistics. NCHS data brief, no. 10. Hyattsville, MD: National Center for Health Statistics. 2012.
4. U.S. Department of Health and Human Services, Health Resources and Services Administration, National Center for Health Workforce Analysis. National and State-Level Projections of Dentists and Dental Hygienists in the U.S., 2012-2025. Rockville, Maryland, 2015.
5. Formicola AJ, Bailit HL. Community-based dental education: history, current status, and future. J Dent Educ 2012;76(1):98-106.
6. Kansas Board of Regents. Oral Health Task Force: Finding and Recommendations. 2012.
7. Wanchek TN, Rephann TJ. Effects of a proposed rural dental school on regional dental workforce and access to care. Rural and Remote Health 2013;13(2):2366.
8. Storbacka K, Nenonen S. Markets as configurations. Eur J Marketing 2011:45(1-2):241-58.
9. Porter ME. The five competitive forces that shape strategy. Harvard Bus Rev 2008;86(1):78-93.
10. Missouri Department of Health and Senior Services. Office of Primary Care and Rural Health. Missouri's Dentists – 2014. Accessed 4-11-16 at: http://health.mo.gov/living/families/primarycare/pdf/MissouriDentistsWorkforce.pdf.
11. Vujicic M. Where do dental school graduates end up locating? JADA 2015; 146(10):775-777.
12. Sharifian N, Bedos C, Wootton J, et al. Dental students' perspectives on rural dental practice: a qualitative study. J Can Dent Assoc 2015; 81:f23:
13. Ahmed A, Pyle M, Gadbury-Amyot CC. Feasibility study planning for a satellite program of an established school of dentistry. J Dent Educ, 80(4):384-392, 2016.

University of Missouri-Kansas City
School of Dentistry