Milieu in Dental Schools and Practice

Enrichment and Recruitment Programs at Dental Schools: Impact on Enrollment of Underrepresented Minority Students


Abstract: Dental schools have created summer enrichment and recruitment programs to increase enrollment of underrepresented and disadvantaged students. Enrichment programs strengthen students’ academic skills in the areas of basic medical sciences, communications, test taking, and other learning strategies. The purpose of this study was to identify program characteristics of summer enrichment and recruitment programs and to determine which characteristics predicted participant enrollment in dental school. Twenty-three schools received a survey, and seventeen responded for a response rate of 74 percent. The majority of program participants were underrepresented minority (URM) students (program median=99 percent). The leading program goals were to increase minority enrollment (47 percent) and URM competitiveness (35 percent). The median program length was seven weeks and forty hours per week. Programs offered the following components: basic sciences (thirty-two median hours), DAT review/preparation (thirty median hours), introduction to dentistry (sixteen median hours), preclinical laboratory activities (sixteen median hours), and learning strategies (nine median hours). The length of program time in existence was a significant predictor of participant enrollment into dental school (R square=.320; p=.035). The overall median percentage for dental school enrollment in the study was 52.3 percent. The directors of six programs who place more than 60 percent of their students in dental school were interviewed. They reported that mentorship, institutional support, program structure, and admission policies were key factors contributing to success. It is concluded that recruitment and enrichment programs are a viable option to increase URM dental school enrollment.

Dr. Gravely is Assistant Professor, Department of Biologic and Diagnostic Sciences, University of Tennessee College of Dentistry; Ms. McCann is Director of Planning & Assessment and Associate Professor, Baylor College of Dentistry, The Texas A&M University System Health Science Center; Dr. Brooks is Director of Student Development and Associate Professor, Baylor College of Dentistry, The Texas A&M University System Health Science Center; Dr. Harman is Associate Dean for Student and Alumni Services and Associate Professor, Baylor College of Dentistry, The Texas A&M University System Health Science Center; and Dr. Schneiderman is Executive Director of Information Technology Services and Associate Professor, Baylor College of Dentistry, The Texas A&M University System Health Science Center. Direct correspondence and requests for reprints to Dr. Tamara Gravely, University of Tennessee College of Dentistry, 875 Union Ave, Memphis, TN 38163; 901-448-6914 phone; 901-448-2671 fax; tgravely@utmem.edu. This project was funded by the Baylor Oral Health Foundation.

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The enrollment of underrepresented minorities in U.S. dental schools does not reflect the proportion of underrepresented minorities (URM) in the general population. According to the 2000 U.S. Census Bureau data, 25.8 percent of the U.S. population is comprised of underrepresented minorities (African Americans, Hispanics, and Native Americans). In the 1999-2000 school year, URM students made up only 10.5 percent of the U.S. dental school population. For the year 2000 entering class, URM students comprised 10.6 percent of the first-time, first-year enrollees. In an attempt to rectify the disparities in access to health care, the Health Careers Opportunity Program (HCOP) was started in 1971 under the Comprehensive Health Manpower Training Act, Public Law 92-157. HCOP is under the jurisdiction of the Health Resources and Services Administration, Bureau of Health Professions. The purpose of HCOP was to award money to health professions schools for creating programs to increase the number of minority students admitted to and graduated from health professions schools. The areas supported by HCOP are dentistry, medicine, optometry, veterinary, oste-
pathy, pharmacy, and podiatry. The allied health professions, public health, and health care administration also receive support from HCOP.

In response to legislation that challenged the legality of minority-focused recruitment efforts, the Bureau of Health Professions has shifted focus from URM students to students from disadvantaged backgrounds. A disadvantaged background is defined as an environment that has inhibited an individual from obtaining the knowledge, skills, and abilities required to enroll in and graduate from a health professions school or from a family with an annual income below a level based on low-income thresholds.

Dental schools have created special programs, including enrichment, awareness/recruitment, and prematriculation programs to increase enrollment of underrepresented and disadvantaged students. Although the programs share the goal of increasing enrollment of these targeted students, each uses a different method. Enrichment programs strengthen students’ academic skills in the areas of basic medical sciences, communications, test taking, and other learning strategies to successfully compete for acceptance into dental school. Awareness/recruitment programs encourage students to consider dentistry as a career choice. Prematriculation programs are designed to ease the transition into dental school and to increase the retention of students who have been accepted into dental school.

Although enrichment and awareness/recruitment programs have been shown to be effective in increasing URM enrollment in the health professions,8,9 there is little information on the specific success of these programs in increasing dental school URM enrollment. There is also little information about the design of enrichment and recruitment programs in U.S. dental schools. To date, there have not been any published studies that assessed enrichment and recruitment programs, and no papers have proposed recommendations for effective strategies to enhance URM enrollment into dental school. It is not known what factors in enrichment and recruitment programs contribute to the dental school enrollment of participants.

The purpose of this study was to identify the characteristics of dental enrichment and recruitment programs and determine which of these characteristics predict program participant enrollment in dental school. The discovery of such program characteristics could lead to effective strategies for increasing URM enrollment in dental school.

Materials and Methods

Due to the range of programs available, only recruitment/enrichment programs for current college students and college graduates were included in this study. The survey questions, unless otherwise stated, were for the 2001 program year only. The survey, consisting of a four-page booklet, addressed three major areas:

1. Background: program goals, prerequisites, program maturity, program funding, student demographics, program history, and number of participants.
2. Components: length of program, academic courses, Dental Admission Test preparation, testing and grading policies, amount of time spent in courses, identification of faculty, student-personnel ratio, attendance policy, and stipends.
3. Outcomes: tracking methods, participant feedback, number of participants enrolled in dental school, and program reputation.

The first author called the fifty-two U.S. dental schools to determine the presence of enrichment and/or recruitment programs at their institutions and developed a list of program directors (n=23). A pilot of the survey was conducted using three program directors from the list. In the packet for the actual survey, deans of the twenty-three schools received an introductory letter from Dr. James Cole, Dean of Baylor College of Dentistry, and a request to forward the survey to the program director. A second cover letter was included for the program directors. The mailings consisted of cover letters, questionnaire, and a pre-addressed/postage-paid return envelope.

Due to the small sample size, multiple methods were used to ensure the return of surveys from all of the programs contacted. These included two-week reminder notices, three mailings of the survey, and finally telephone calls and email messages to program directors.

Directors of six programs with the greatest success in enrolling participants in dental school (that is, dental school enrollment rates higher than 60 percent) were contacted for phone interviews. To gain further understanding of the programs, the directors were asked to discuss factors that they believed contributed to program participants’ enrolling in dental school.

Data analysis was performed using SPSS software. Descriptive statistics were used to summarize the survey data. Correlations and chi square analy-
ses were used to identify program characteristics associated with the success of enrichment programs, that is, enrollment of students in dental school. Regression analysis was used for estimating the value of the program characteristics for predicting enrollment in dental school. Qualitative data were analyzed for common themes.

Results

Seventeen of the twenty-three enrichment programs returned the survey, with a response rate of 74 percent. Due to the non-normally distributed responses for most questions, the median was chosen for describing central tendency. The numbers of responses to questions varied because not all program directors answered every question.

Program Background

Figure 1 shows the primary program goals chosen by directors. The goal “to increase minority enrollment in their institution” (47.1 percent) was the most common choice. The second most common goal chosen was to increase URM competitiveness for dental school admission (35.3 percent). The two write-in responses, categorized as Other, were “all equally applicable” and “improve performance on BMS (biomedical sciences) courses.”

Figure 2 details program funding sources. Home institutions provided funding to over 75 percent of the programs surveyed, and HCOP provided funding for 47 percent of programs. Funding was provided by more than one source in 64.7 percent of the programs (eleven out of seventeen).

Program maturity is detailed in Figure 3. Established programs (in existence for fifteen or more years) were the largest group of survey respondents (n=7).

Program Participants and Dental School Enrollment

Table 1 lists information on program maturity (years in existence), total program participants, total URM participants, the percentage of URM participants, the number of participants to enroll in dental school, and the percentage of program participants to enroll in dental school. Three programs did not provide complete data on program participants and were not included in the table. It was too early for these three new programs (one to four years) to have participants enrolled in dental school at the time the survey was conducted. In eleven of the fourteen programs, URM students comprised the majority of par-

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Figure 1. Primary program goals

- DAT scores: 6%
- Other: 12%
- URM competitiveness: 35%
- Minority enrollment: 47%
participants. The median number of total participants per program was seventy-eight, and the median of total URM students was sixty-six. The median percentage of URM participants was 99 percent. The overall median percentage of participants to enroll in dental school was 52.3 percent.

Chi square analysis demonstrated a significant association ($p=.041$) between program time in existence and percent of participants enrolled in dental school. This was also confirmed through regression analysis. The R-square value was .320 with one third of the variance in the percentage of participants en-

Figure 2. Program funding sources

Figure 3. Program maturity
rolled in dental school explained by program maturity (p = .035). This finding supported the hypothesis that certain program characteristics are statistically associated with success of recruitment/enrichment program participants’ gaining enrollment in dental school. To further explore this relationship, a percent of total participants enrolled in dental school was calculated for each program.

Figure 4 illustrates this trend of increasing enrollment in dental school with increasing program maturity. The sample is naturally dichotomized between programs with either less than or more than 60 percent enrollment. Using this data, programs with 60 percent or greater participant enrollment in dental school were classified as highly successful programs. Six of the seventeen programs fell into this category. Four of these programs had existed for fifteen years or more, one program had existed for ten to fourteen years, and one was a new program in the one to four year category. These six programs are in bold type in Table 1.

**Program Components**

The seventeen programs varied in length, hours spent per week, and curriculum components offered. The median program length was seven weeks in duration. The median total hours per week were forty hours. Table 2 details the frequency of program components and the number of hours assigned to these components. The following components were included in the curriculum in more than 70 percent of the programs: DAT review/preparation, basic sciences/biomedical sciences, the admissions process, mentoring activities, and classes on learning strategies/organizational skills. Basic sciences (median=32 hours), DAT review (median=30 hours), and preclinical laboratory activities (median=24 hours) received the largest number of total program hours in the programs surveyed. In addition, basic sciences instruction and DAT review courses were offered by 70.6 percent of programs. Two programs did not offer DAT review. The Kaplan® DAT preparation course was the most common DAT preparation/review course offered (see Figure 5).

Concerning program instruction, greater than two-thirds of the academic courses were taught by full-time dental or medical school faculty in 25 percent of the programs (see Figure 6). Only one program out of the seventeen did not employ attendance policies. Participants were tested in 68.8 percent of the programs, and grades were given in 37.5 percent of the programs.

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**Table 1. Program maturity and participants**

<table>
<thead>
<tr>
<th>Program Maturity</th>
<th>Total Participants</th>
<th>Total URM Participants</th>
<th>Percentage URM Participants**</th>
<th>Number Enrolled in Dental School</th>
<th>Percentage Enrolled in Dental School</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 yrs or &gt;</td>
<td>39</td>
<td>39</td>
<td>100 percent</td>
<td>36</td>
<td>92.3 percent</td>
</tr>
<tr>
<td>15 yrs or &gt;</td>
<td>10</td>
<td>10</td>
<td>100 percent</td>
<td>10</td>
<td>100 percent</td>
</tr>
<tr>
<td>15 yrs or &gt;</td>
<td>600</td>
<td>588</td>
<td>98 percent</td>
<td>510</td>
<td>85 percent</td>
</tr>
<tr>
<td>10-14 years</td>
<td>78</td>
<td>78</td>
<td>100 percent</td>
<td>41</td>
<td>52.5 percent</td>
</tr>
<tr>
<td>10-14 years</td>
<td>165</td>
<td>165</td>
<td>100 percent</td>
<td>115</td>
<td>69.6 percent</td>
</tr>
<tr>
<td>10-14 years</td>
<td>200</td>
<td>200</td>
<td>100 percent</td>
<td>168</td>
<td>84 percent</td>
</tr>
<tr>
<td>10-14 years</td>
<td>66</td>
<td>66</td>
<td>100 percent</td>
<td>11</td>
<td>16.6 percent</td>
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<tr>
<td>10-14 years</td>
<td>101</td>
<td>27</td>
<td>26.7 percent</td>
<td>45</td>
<td>44.5 percent</td>
</tr>
<tr>
<td>5-9 years</td>
<td>143</td>
<td>114</td>
<td>79.7 percent</td>
<td>60</td>
<td>41.9 percent</td>
</tr>
<tr>
<td>5-9 years</td>
<td>112</td>
<td>83</td>
<td>74.1 percent</td>
<td>51</td>
<td>45.5 percent</td>
</tr>
<tr>
<td>1-4 years</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1-4 years</td>
<td>6</td>
<td>6</td>
<td>100 percent</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1-4 years</td>
<td>44</td>
<td>3</td>
<td>6.8 percent</td>
<td>44</td>
<td>100 percent</td>
</tr>
<tr>
<td>1-4 years</td>
<td>5</td>
<td>N/A</td>
<td>N/A</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Overall Median</td>
<td>78</td>
<td>66</td>
<td>99 percent</td>
<td>425</td>
<td>52.3 percent</td>
</tr>
</tbody>
</table>

* Enrollment data from three programs were not available and so are not included in calculations.
** Programs in bold: >60 percent enrollment in dental school.
Program Outcomes

The programs used a variety of methods to track program participants (Table 3). The two most common tracking methods used by programs were documenting the number of participants who applied to dental school and the number of former participants who enrolled into dental school. Eighty-seven percent of the programs used these two methods. Seventy-five percent of the programs surveyed also tracked participant enrollment into other professional or graduate programs. Fifty percent of the programs assessed pre- and post-program DAT scores. Only 38 percent of programs assessed participant pre- and post-program overall grade point average (GPA) and science GPA.

A five-point Likert scale was used to determine program directors’ opinions about their programs’ reputation in the academic and local community. The directors were asked to respond by choosing strongly disagree (1), disagree (2), neutral (3), agree (4), or strongly agree (5). As shown in Table 4, the majority of the program directors (53 percent) “strongly agreed” that their home institution had made a major commitment to the program. In addition, 53 percent “strongly agreed” that the program was well known within the home institution. Program directors were not as confident about program reputation within the local community, with 41 percent feeling “neutral” in respect to program reputation.

Table 2. Program components

<table>
<thead>
<tr>
<th>Program Component</th>
<th>Percentage of Programs with Component</th>
<th>Median Total Program Hours (Range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAT Review/Preparation</td>
<td>88.2 percent</td>
<td>30 hours (4-134)</td>
</tr>
<tr>
<td>Dental School Admission Process</td>
<td>88.2 percent</td>
<td>5.5 hours (2-16)</td>
</tr>
<tr>
<td>Basic Sciences/Biomedical Sciences</td>
<td>82.4 percent</td>
<td>32 hours (2-192)</td>
</tr>
<tr>
<td>Mentoring (paired with faculty and/or students)</td>
<td>82.4 percent</td>
<td>12 hours (3-60)</td>
</tr>
<tr>
<td>Learning Strategies, Organizational Skills</td>
<td>76.5 percent</td>
<td>9 hours (3-80)</td>
</tr>
<tr>
<td>Preclinical Laboratory Activities</td>
<td>70.6 percent</td>
<td>24 hours (5-225)</td>
</tr>
<tr>
<td>Introduction to Dentistry Courses</td>
<td>52.9 percent</td>
<td>16 hours (1-32)</td>
</tr>
<tr>
<td>Professional Shadowing (paired with private practice dentist)</td>
<td>52.9 percent</td>
<td>14 hours (4-32)</td>
</tr>
</tbody>
</table>
Phone Interviews

Four of the six directors of highly successful (>60 percent enrollment in dental school) programs participated in the phone interviews. The program directors were asked what factors contributed to the success of their program participants’ enrolling in dental school. Advising and mentoring techniques, admissions criteria and procedures, program structure, and institutional commitment were common themes repeated by the program directors (Figure 7).

Figure 5. How programs provide DAT preparation

Figure 6. Proportion of courses taught by full-time faculty
Regarding advising, the enrichment/recruitment program staff and faculty developed relationships with the participants (developed a personal interest in the participants). Three of the highly successful programs used very direct personal contact in helping students in the program. One program director stated, “I tell them to call me at home if they need to.” The enrichment/recruitment program faculty and staff serve as a resource for information on the application and interviewing process. Two programs maintain contact with the students during the school year following completion of the summer program. Current dental students also aid in the advising process, serving as mentors and guides to the school and surrounding area. Program participants visit local minority dental practices for professional shadowing experiences. One director stated, “Students are able to see it is doable.”

Three program directors stressed the importance of preparing participants for the admissions process. Some factors that helped program participants to gain admission into dental school were mock interviews, strong summer program performance, and exposure to dental school faculty that serve on the admissions committee. Three out of the four program directors interviewed were voting members of their dental school’s admissions committee. At one school, the admissions committee quickly extends an offer for admission to qualified URM students to prevent the students from being recruited by another dental school.

Three out of the four program directors interviewed cited a strong program structure as another factor for success. A rigorous curriculum and financial compensation were placed into this category. Depending on the program’s mission, curricular emphasis was either on DAT preparation/review or basic sciences enrichment. These program directors stated that program participants were provided stipends and room and board so that the students could focus on the program. Two programs also provided travel allowances.

The last theme was institutional commitment: the home institution fully believed in the program’s mission. Two of the four program directors interviewed cited this as a success factor. One director stated, “The school believes in it. Once the students see that, this is where they want to be.”

**Discussion**

The purpose of this study was to identify program characteristics of enrichment and recruitment programs and to determine which characteristics predicted participant enrollment in dental school. Program maturity was the variable that was identified
as significantly associated with participant enrollment in dental school. Ten of the seventeen programs in this study had been in existence for ten or more years.

The enrichment and recruitment programs in this study had a good track record of participant matriculation into dental school, with an overall mean of 52 percent dental school enrollment. This value is similar to the findings of a fifteen-year follow-up of the Medical/Dental Education Preparatory program at Southern Illinois University School of Medicine.8 In the Jackson study, of the 404 students that completed that summer program, 55 percent or 223 had been accepted into health professions schools. Six of the seventeen enrichment and recruitment programs were classified as highly successful because more than 60 percent of their participants enrolled in dental school. All but one of these programs were very mature, that is, in existence for ten or more years. These highly successful programs had the following characteristics in common: supportive mentor and advisor relationships with participants, proactive admission policies and procedures, rigorous program structure, and substantial institutional support in the form of finances and/or other resources. These characteristics have been cited in previous studies as critical for the success of enrichment and recruitment programs.8-11

It has been established that URM dental professionals play an important role in providing treatment to minority and poor populations.12,13 It has also been reported that these groups are more likely to have unmet dental needs.14 These disparities in the utilization of services exist in all branches of health services. The government had a special interest in closing the gaps that exist in health care utilization and created initiatives such as the Health Careers Opportunity Program. These statements are made to emphasize the need for continued recruitment of URM students into dental school. At the current time, dental school administrators are grappling with how to increase URM enrollment using nondiscriminatory tactics. As this study demonstrated, summer enrichment and recruitment programs are a viable option to maintaining a diverse dental school student enrollment. The median percentage of URM participants in these programs was 99 percent, and the overall dental school enrollment of participants was 52 percent. These results give additional evidence that enrichment and recruitment programs have been effective in increasing URM enrollment into graduate health professional schools.8,9,11,15,16

Based on the information gathered from this study, the following recommendations are made for the design and administration of dental recruitment/enrichment programs. The program should simulate
the dental school curriculum in content and format with emphasis placed on the basic sciences and DAT preparation. The program should offer the following courses: basic sciences, DAT review/preparation, introduction to dentistry including laboratory activities, and learning strategies. Additional experiences that should be included are workshops on the admission process and financial aid. While total program hours for components varied from program to program, seven weeks was the median program length and for this reason is the recommended minimum program length.

Tracking is a major component of program outcomes assessment and is necessary to determine the effectiveness of the program. Although participant tracking is mandated for HCOP-funded programs to retain program funding, programs without HCOP funding may have no requirement for tracking student success within enrichment programs and later into health professions programs. Program administrators need to track former program participants to determine subsequent graduation from college, application and matriculation to graduate school or entry into the workforce, and completion of graduate training. Support staff can be used in tracking efforts, and the employment of various methods such as email and late afternoon and early evening phone calls can yield favorable results.

Standardized outcomes assessment as utilized in most other areas of higher education is needed for recruitment and enrichment programs. Standardized outcomes assessment would allow for cross-program comparisons. It is possible to use enrichment/recruitment program participant enrollment into dental school or participant pre- and post-program DAT scores as outcome standards for enrichment/recruitment programs. Standardized outcomes assessment can help in determining components and tactics that lead to success.

In this study, program directors of the successful programs cited institutional support as a key factor for the success of the enrichment and recruitment program. Institutionalization has been cited by several authors as a major part of the framework for implementing an effective enrichment/recruitment program. Enrichment and recruitment programs require support in the form of funding to finance program operations and facilities to conduct program classes and activities. A program administrator needs staff to assist with program operations, program publicity efforts, and participant tracking. The initiative has to be seen as valuable by the school’s senior administration, or the program will fail. The program administrator should also recruit colleagues to serve as mentors to participants. Mentoring has been cited as important to successful programs in this study.

An area for future research would be to assess the graduation rates of enrichment and recruitment program participants from dental school. Another avenue for research would be to survey current URM dental students to determine the proportion that had participated in enrichment/recruitment programs. A comparison of URM enrollment between schools with and without enrichment and recruitment programs might further support the efficacy of these programs.

This study provides information on the components, participant demographics, and outcomes of dental enrichment and recruitment programs. It has also identified a possible strategy for increasing the enrollment of URM students in dental school. Dental schools are competing with other disciplines for the same academically gifted URM students. Dental schools can use enrichment and recruitment programs to introduce URM students to the possibility of dentistry as a career and to develop a larger pool of competitive URM students. In view of the current legislative climate that limits the recruitment of URM students into dental school, enrichment and recruitment programs are a suitable option to increase diversity in dental school enrollment.

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