A Survey of Information Technology Management at U.S. Dental Schools


Abstract: The purpose of this project is to assess how information technology (IT) is being implemented and managed in U.S. dental schools. Recent advances in IT have restructured many of the administrative, curricular, and clinical functions in dental schools. Purchasing hardware and software and hiring personnel to maintain IT present significant financial and administrative commitments for these schools. A nine-question survey was sent to all U.S. dental schools via email with a follow-up postal mailing. Forty-six surveys were returned (83.6 percent response rate). The analysis indicates that dental schools are managing IT in vastly different ways. For example, 71 percent of the schools report a centralized structure, and 61 percent have a line item in the budget to manage IT. On average there are 4.4 full-time equivalents hired to manage IT, with the majority of these people being trained in IT (eight schools reported dually trained IT/dental personnel). The majority of schools report using software to manage their admissions process (70 percent), curriculum analysis (72 percent), and delivery of curriculum content (72 percent), as well as to manage their student clinics (91 percent, business aspect; 87 percent, patients; 65 percent, grading on clinic floor; 76 percent, managing clinical evaluations) and faculty practices (85 percent, business aspect; 65 percent, patients). The use of multimedia (50 percent) and simulation (52 percent) in the preclinical area is mixed. The purchase of laptops (24 percent) and PCs (11 percent) is required in almost a third of all schools participating in this survey. Dental schools in the United States are managing IT in a variety of different ways, using various internally and commercially available tools. The cost to institutions can be large and is usually handled in centralized structures in the school with fixed budgets. The results of this survey can be used to assist schools in the planning and implementation of IT at their institutions.

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Key words: information technology, dental education

Submitted for publication 5/27/03; accepted 8/21/03

The information technology (IT) boom of the 1990s has forever changed the way dental schools manage their admissions process, their clinics, and their curriculum. Ten years ago, innovations using digital images and interactive software to create a digital curriculum to enhance student problem-solving and decision-making were considered visionary. In the late 1980s when the potential of the computer in education was evident, the American Association of Dental Schools (AADS; now the American Dental Education Association, ADEA) became involved in coordinating the initiatives to apply computer technology among its membership. The result was a 1987 AADS report that defined the term “dental informatics” as “the application of information technology to dental education, research, administration, and patient care.” The report also recommended the creation of a committee to become the coordinating body for AADS efforts to implement dental informatics. In 1988 the Special Committee on Information Technology was created and started work on a strategic plan. In 1989 the committee formed five consortia to address aspects of dental informatics in patient simulation, decision support, clinical systems, preclinical videodisk teaching systems, and electronic courseware and curriculum development.

Information technology has secured a central role in daily school activities. Institutions began progressively incorporating IT into their daily functions as it became available over the years. A key factor in the increase of IT application has been the advancement in computer processing power in the last decade. The rapid development of computer literacy and adaptation of IT have revolutionized the way universities approach administrative as well as educational duties in medical and dental schools internationally.

Although there are reports describing the advancements of IT and successful implementation of
various IT functions at individual institutions across the world, little literature is available assessing the state of IT at dental schools nationwide. To effectively measure progress in IT implementation and help institutions apply limited resources most appropriately to maximize efficiency of IT incorporation into a school’s educational and clinical functions, it is necessary to comparatively assess how institutions are dealing with the challenges of managing various aspects of IT. The goal of this paper is to help faculty understand the current IT landscape by characterizing the spectrum of information technology application across U.S. dental schools.

Methods and Data Collection

A nine-point survey designed to assess the management of IT at U.S. dental schools was sent to all fifty-five U.S. dental schools by email via the ADEA Council of Faculties, followed by a postal mailing to schools that had not replied by email.

The survey focused on the application of IT across a broad spectrum of functions. The main questions addressed included IT management, admissions management, curriculum delivery, management of student and faculty practices, and IT use in grading and evaluation. The survey also analyzed the types of software packages used for those purposes, website development and maintenance, and preclinical multimedia and simulation use. The survey appears in Appendix 1. Appendix 2 contains website contact information for companies authoring the software schools reported. An open-ended question was incorporated at the end of the survey for respondents to add comments, thoughts, or clarifying points. Descriptive statistics were calculated and analysis of compiled data was performed using Microsoft Excel 2002.

Results

Of the fifty-five U.S. dental schools to which questionnaires were mailed, forty-six schools responded, a response rate of 83.6 percent. In the case where not all schools responded to a particular inquiry, the actual number responding was used in the tabulation of the results for each question.

General IT Department Characterization

Schools’ management of decisions to implement IT. The first four survey questions dealt with the structure and logistic organization of the IT departments at the schools. Respondents were asked to indicate how management decisions related to IT implementation were made. Of the forty-six schools that responded, thirty-three (71.7 percent) said that these decisions are handled in a centralized structure in the form of an Information Technology Committee. Three schools (6.5 percent) reported decision implementation in a decentralized process defined by the survey as “department level, clinical affairs, etc.” Nine schools (19.6 percent) reported the use of both processes in IT implementation decisions. The results discussed below are summarized in Figure 1.

Inclusion of IT in yearly budget. Of the forty-six schools that responded to the survey, twenty-eight (60.9 percent) said that they include IT as an individual line item in their yearly budget. Seventeen (37 percent) of the schools reported they do not include IT as a line item. One of the responding schools did not answer this question (see Figure 1).

Characterization of staff devoted to implementation and maintenance of IT. Forty (87 percent) schools said that they have a full-time staff devoted to implementation and maintenance of IT, while six (13 percent) did not. Of the schools with full-time staff, eight (17.4 percent) had at least one dentist on the committee. The mean number of full-time staff varied from one person to as many as ten, with an average of 4.4 (std dev 2.65).

Utilization of university-wide resources for IT management. Forty-one schools (89 percent) responded affirmatively that they use university-wide resources, while five (11 percent) said they do not. Of the responding schools, only a few specified the type of resources shared on the university level, ranging from Health Center Resources, to campus-wide IT council, to only shared networking (Figure 1).

Application of IT in Admissions

Thirty-two schools (69.6 percent) reported the use of software programs in management of applications and admissions. Ten (21.7 percent) schools responded negatively, and four (8.7 percent) did not answer the question (Figure 2). Thirty schools specified software used in the process, so percentages are
calculated based on those thirty. Two schools said they use software but did not indicate the package, while some schools reported use of multiple software packages. One school (included in analysis) indicated future use of software. The breakdown of popular software used by the schools appears in Table 1.

**Application of IT in Curriculum Development and Delivery**

As shown in Figure 2, thirty-three schools (71.7 percent) reported the use of software for curriculum analysis, nine (19.6 percent) said they don’t use software in the curriculum for analysis, and four (8.7 percent) did not answer. Thirty-three schools (71.7 percent)
Table 1. Software used for management of admissions

<table>
<thead>
<tr>
<th>Software Package</th>
<th>Schools</th>
<th>% of yes response</th>
</tr>
</thead>
<tbody>
<tr>
<td>AADSAS, Aclient (TASCA), ADEA, ADMIT</td>
<td>16</td>
<td>50.00%</td>
</tr>
<tr>
<td>Specially Developed</td>
<td>9</td>
<td>28.13%</td>
</tr>
<tr>
<td>Peoplesoft</td>
<td>2</td>
<td>6.25%</td>
</tr>
<tr>
<td>Microsoft</td>
<td>1</td>
<td>3.13%</td>
</tr>
<tr>
<td>GSD Quick Recovery</td>
<td>1</td>
<td>3.13%</td>
</tr>
</tbody>
</table>

Table 2. Software used for curriculum analysis

<table>
<thead>
<tr>
<th>Software Package</th>
<th>Schools</th>
<th>% of yes response</th>
</tr>
</thead>
<tbody>
<tr>
<td>CATS, ADEA</td>
<td>15</td>
<td>45.45%</td>
</tr>
<tr>
<td>Internally Developed</td>
<td>6</td>
<td>18.18%</td>
</tr>
<tr>
<td>Blackboard</td>
<td>2</td>
<td>6.06%</td>
</tr>
<tr>
<td>Health Sciences Database</td>
<td>1</td>
<td>3.03%</td>
</tr>
<tr>
<td>CourseWorks</td>
<td>1</td>
<td>3.03%</td>
</tr>
</tbody>
</table>

percent) reported the use of software for curriculum delivery, twelve (26.1 percent) said they don’t use IT in delivery of curriculum, and one (2.2 percent) did not respond. Almost half the responders used the Curriculum Analysis Tool (CATS), the ADEA software for curriculum analysis. Others used internally developed systems as well as other packages. As indicated in Table 2, the software titles varied.

In cases where schools reported use of software products for purposes of curriculum delivery, respondents were asked to indicate whether IT was used in delivery of the entire curriculum or on a course-specific basis and which technologies were used. Figure 3 provides a summary of IT use in curriculum delivery. Sixteen schools (48.5 percent of the thirty-three affirmative responses) reported use of software programs for the entire curriculum, and seventeen schools (51.5 percent of the thirty-three affirmative responses) used software on a course-specific level.

The most popular technology used was the DVD curriculum (school course materials and current textbooks in digital format distributed on DVD) at seven schools (21.2 percent) and the Blackboard
Internet-based course software at nine schools (27.3 percent). Other technology used included internally developed web pages on the Internet (the Internet-based course management software such as WebCT or Blackboard), Personal Digital Assistants (PDAs), and CD-ROMs.

**Application of IT for Clinic and Student Management**

Survey respondents were requested to characterize the schools’ use of IT in both the student and faculty clinic for business management of the practice (appointments and billing), patient management (charting and treatment planning), grading and evaluation of students in the clinic, and management of student grades and completed procedures. The results are summarized in Figure 4. Forty-two schools (91.3 percent) reported the use of software in management of student clinics, while four (8.7 percent) did not; thirty-nine (84.8 percent) used software in management of faculty practice, while four (8.7 percent) did not; and three (6.5 percent) answered “not applicable.” For patient management, forty schools (87 percent) reported use of software in student clinics, while six (13 percent) did not; thirty schools (65.2 percent) indicated software use in faculty practice, while twelve (26.1 percent) did not; one (2.2 percent) did not respond; and three (6.5 percent) without a faculty practice answered “not applicable.” For grading and evaluation of students in the clinic, thirty schools (65.2 percent) reported that they use software, fifteen (32.6 percent) said they do not, and one (2.2 percent) did not respond. For management of student grades and keeping track of procedures completed by students, thirty-five (76.1 percent) said they use software, ten (21.7 percent) did not, and one (2.2 percent) did not respond.

As indicated in Table 3, the software packages used in the various management aspects varied greatly among the schools. These software were used for appointment scheduling, billing, and patient management in the student clinic including charting and treatment planning. The most commonly used software packages were General Systems Design/Quick Recovery (26.2 percent), internally developed software (21.4 percent), Quality Systems Inc. (QSI) (16.7 percent), and Axium (11.9 percent), but various other packages were reported. The software packages used in the schools’ faculty clinics (for appointments and billing vs. charting and treatment planning) showed much greater variety and are summarized in Table 4.

**Development of the Schools’ Websites**

The survey also assessed how the schools developed and maintained their official institutional websites. Six schools (13 percent) reported that the website was developed by the university, thirty-nine (84.8 percent) reported development by the dental school itself, and one (2.2 percent) by the related
medical school. At thirty-one schools (67.4 percent), a designated person was in charge of site maintenance, while at eleven schools (23.9 percent) the administrative staff is responsible, at three schools (6.5 percent) the IT staff, and at one school (2.2 percent) the public affairs office. The results of website maintenance management are summarized in Figure 5.

Schools’ Use of Technology in Education

Respondents were asked to describe the various technologies used in clinical education and to identify the requirements of specific technology purchased by students. When asked if the school has a

Table 3. Software packages used in Student Clinic

<table>
<thead>
<tr>
<th>Software Package</th>
<th>Percentage of yes responses</th>
</tr>
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<tbody>
<tr>
<td>General Systems Design/Quick Recovery</td>
<td>26.19%</td>
</tr>
<tr>
<td>Internally Developed</td>
<td>21.43%</td>
</tr>
<tr>
<td>QSI</td>
<td>16.67%</td>
</tr>
<tr>
<td>Axium</td>
<td>11.90%</td>
</tr>
<tr>
<td>Windent</td>
<td>4.76%</td>
</tr>
<tr>
<td>Dentech</td>
<td>4.76%</td>
</tr>
<tr>
<td>Dentrix</td>
<td>4.76%</td>
</tr>
<tr>
<td>Prodata</td>
<td>2.38%</td>
</tr>
<tr>
<td>Medical Manager</td>
<td>2.38%</td>
</tr>
<tr>
<td>Unspecified</td>
<td>9.52%</td>
</tr>
</tbody>
</table>

Table 4. Software package used in Faculty Practice

<table>
<thead>
<tr>
<th>Software Package</th>
<th>Percentage of yes responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dentech/SoftDent</td>
<td>20.52%</td>
</tr>
<tr>
<td>Internally Developed</td>
<td>15.38%</td>
</tr>
<tr>
<td>QSI</td>
<td>10.26%</td>
</tr>
<tr>
<td>Dentrex</td>
<td>10.26%</td>
</tr>
<tr>
<td>General Systems Design/Quick Recovery</td>
<td>7.69%</td>
</tr>
<tr>
<td>Practiceworks</td>
<td>7.69%</td>
</tr>
<tr>
<td>Axium</td>
<td>7.69%</td>
</tr>
<tr>
<td>Windent</td>
<td>5.13%</td>
</tr>
<tr>
<td>Daisy</td>
<td>2.56%</td>
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<tr>
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</tr>
<tr>
<td>Medical Manager</td>
<td>2.56%</td>
</tr>
<tr>
<td>IDX</td>
<td>2.56%</td>
</tr>
<tr>
<td>Unspecified</td>
<td>12.82%</td>
</tr>
</tbody>
</table>

Note: Some schools indicated use of multiple packages.

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<td>Unspecified</td>
<td>12.82%</td>
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</table>

Note: Two schools indicated use of multiple packages.
“multimedia preclinical space” (computer and visual resources for preclinical years), twenty-three schools (50 percent) said yes, twenty-one (45.7 percent) said no, and two (4.4 percent) did not respond (Figure 6).

According to our findings, simulation is used in preclinical courses in twenty-four schools (52.2 percent), while twenty (43.5 percent) schools do not use simulation, and two (4.4 percent) did not answer (Figure 6). The number of simulators used varied greatly among schools, ranging from none and two simulators to as many as 115. Vendors also varied widely, ranging from Stagefront, ADEC, MORITA, KAVO, and DentSim to internally developed simulators.

At certain schools, students were required to purchase specific equipment as part of the curriculum. Eleven schools (23.9 percent) required laptop computer purchase, five (10.9 percent) required a PC purchase, eighteen (39.1 percent) did not require any hardware purchase, and ten (21.7 percent) did not answer. At the time of the survey, no schools reported the requirement of a PDA purchase. Figure 7 summarizes the breakdown of required IT purchase.

**Discussion**

In general the results indicate wide application of IT in most aspects of dental education at all responding institutions, with much variability in the minor details across the schools’ management of IT.

**General IT Department Characterization**

The survey indicated that the great majority of schools (72 percent) manage decisions to implement IT in a centralized committee structure. Many schools (61 percent) have IT as a separate budget item, and most (87 percent) have several full-time, IT-trained
personnel; these percentages suggest that IT has become an important and permanent component of administrative decision-making. While most schools appear to have an IT committee, it is interesting that only five (9 percent) had a categorized “Information Technology” heading and contact information in the 2001-02 ADEA Directory. This trend appears to be a point of interest for the future since many institutions may still be modifying the format or structure of their IT committees.

A majority of schools (61 percent) indicated that their IT department has an individual budget as part of the school’s yearly budget, suggesting that the department has been well established and may have more central control over IT decisions. Of the forty schools (87 percent) that have a full-time IT staff, eight had at least one dentist on the committee. The mean number of full-time staff varied from one person to as many as ten people, with an average of 4.4 personnel. The size of the IT committee did not adhere to any particular pattern in terms of school size or location. Dedication of full-time staff and schools’ commitment of increasing resources to IT implementation suggest IT has been recognized as an important part of the schools’ functioning. The involvement of clinicians in the committee undoubtedly will have a significant impact on decisions regarding clinic management and education issues, such as choice of management software and method of curriculum development. It is logical that familiarity with clinical practice may in fact be a determining factor in many IT decisions.

For management of IT, most schools (89 percent) indicated use of university-wide resources, while five (11 percent) did not. Of the responding schools only a few specified the type of resources shared on the university level, which ranged from Health Center Resources, to campus-wide IT council, to only shared networking. While it was not possible to determine the exact nature of shared resources due to lack of detail in responses, one can speculate that, strategically, university-wide networks or IT support resources are likely to be shared by various colleges and institutions at the university level. From a budgetary standpoint, the use of university-wide resources may help decrease dental school costs, especially at smaller institutions.

**Application of IT in Administration and Admissions**

The implementation of IT in the administrative and admissions process appears extensive, based on 70 percent of schools indicating use of IT in management of applications and admissions. Undoubtedly, a main impact on the increasing use of IT in admissions was the decision to offer the AADSAS centralized application for admission electronically. Over the last few years, schools have upgraded their electronic admissions/application systems and made them easier to use and more efficient. An electronic application process clearly offers benefits both to schools and students, making application data more manageable, reducing errors, and reducing the time required to apply. Schools indicated future plans to increase the use of software in admissions.

**Application of IT in Curriculum Development and Delivery**

Perhaps one of the most influential effects of IT is within the school’s curriculum. Schools provided information regarding use of IT and specific software packages implemented in management of curriculum analysis as well as delivery of curriculum content. Thirty-three schools (71.7 percent) indicated the use of software for both purposes, while various software packages were used. Almost half the responders used the CATS ADEA software for curriculum analysis. Others used internally developed systems as well as other packages.

The survey indicated that sixteen schools used software packages throughout the entire curriculum, and seventeen schools used software on a course-specific level. The most popular technology used included the DVD curriculum at seven schools (21.2
percent) and the Blackboard web-based software at nine schools (27.3 percent). Other technology used included internally developed web pages on the Internet, WebCT, PDAs, and CD-ROMs. The DVD and Internet seem to be particularly useful in academic information distribution. Software such as Blackboard and WebCT allows interactive student participation in course content as well as providing a way to easily deliver specific course content and test knowledge. The software also facilitates student-instructor communication outside the classroom. The rapid development of the Internet in the last decade has truly revolutionized education, allowing for the delivery of tremendous amounts of interactive information. This is also true of dental education, giving students instant access to large databases of clinical information ranging from radiographic to pathological databases across the country at various medical institutions as well as making an enormous body of research available digitally. Given its tremendous potential, we believe that IT implementation in the dental curriculum will likely increase.

Application of IT for Clinic and Student Management

The survey attempted to characterize the use of IT in both the student and faculty clinic for business management of the practice, patient management, grading and evaluation of students in the clinic, and management of student grades and completed procedures. The business aspects of a large practice including appointments and billing greatly benefit from a centralized system. Access to patient data and treatment planning also become more efficient as information becomes instantaneously accessible.

The great majority of schools used software packages in management of both student and faculty clinics (90 percent and 85 percent respectively) as well as patient management (87 percent and 65.2 percent respectively). Over 65 percent of schools indicated use of software for clinical evaluation of students, and over 76 percent reported IT management of student grades and keeping track of procedures completed by students. The number of simulators used varied greatly among schools, ranging from none to as many as 115 with greatly varying vendors. As schools develop the technology content of their curricula, the rise in simulator use appears likely.

At certain schools, students were required to purchase specific equipment as part of the curriculum. At the time of the survey, sixteen schools (35 percent) required students to purchase a laptop or PC while 39 percent did not require any hardware purchase. The requirement for computer purchase is invariably tied to the use of the DVD curriculum, but more schools are requiring computers than use the DVD curriculum. The development of the DVD curriculum or placement of educational course materials and replacement of printed textbooks with digital ones appear to be important trends to watch as schools increase the multimedia content of their curricula. So far seven schools have implemented a DVD-based curriculum. When implementing IT into

Development of Schools’ Websites

Assessment of school website development indicated that the majority of schools (85 percent) developed their own websites while a few schools had sites developed by the university or related medical school. At most schools (67.4 percent) a designated person was in charge of site maintenance indicating that extensive efforts are being extended to maintain website content. The individual or team responsible varied from the administrative staff at many schools to the IT staff and the public affairs office.

The school’s website has truly become the face of the school for many students. It is often the first impression applicants get when considering which dental schools to apply to and usually is the best source of initial information about a particular school. A school intranet is often a useful communication tool within the school itself, serving both faculty and students.

Schools’ Use of Technology in Education

The survey inquired about the use of various technologies in clinical education. Twenty-three schools (50 percent) indicate having a “multimedia preclinical space,” and twenty-four schools (52.2 percent) reported use of simulation in preclinical courses. The number of simulators used varied greatly among schools, ranging from none to as many as 115 with greatly varying vendors. As schools develop the technology content of their curricula, the rise in simulator use appears likely.

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the curriculum, adequate access to computer resources becomes an important issue, but in today’s university environment, student access to computers does not appear to be a problem.

Another important technology that has been progressively making its way into medical clinics and wards is the personal digital assistant (PDA) allowing for recording of patient data and serving as an immediate medical reference. The devices are optional in many places, but have become increasingly popular among physicians and dentists. At the time of the survey, dental schools were not requiring students to purchase PDAs. However, with the development of more software and more powerful PDAs, their use at dental schools is a trend to watch.

Conclusion

The purpose of this study was to survey the management and application of information technology at U.S. dental schools. This survey can be used to assist schools in the planning and implementation of IT at their institution. It can serve as a snapshot of the current status of IT (as of summer 2002) and as a baseline for potential follow-up studies to assess the shifting trends in IT utilization. Given the rapid progress of information technology and its potential for improved patient care, its use at U.S. dental schools is sure to rise. The only uncertainty is how rapidly it will make its way into all aspects of school activity.

Acknowledgments

The authors would like to thank Diane Spinell for assistance with admissions software information and individuals at the following schools for participating in this survey: University of Alabama, University of California, Los Angeles, Loma Linda University, University of the Pacific, University of Colorado, University of Connecticut, Howard University, University of Florida, Nova Southeastern University, Medical College of Georgia, Indiana University, University of Iowa, University of Kentucky, University of Louisville, Louisiana State University, Harvard University, Tufts University, University of Mississippi, University of Missouri-Kansas City, Creighton University, University of Nebraska, University of Nevada, Las Vegas, University of Medicine and Dentistry of New Jersey, Columbia University, New York University, State University of New York at Buffalo, State University of New York at Stony Brook, University of North Carolina, Chapel Hill, Case Western Reserve University, Ohio State University, University of Oklahoma, Oregon Health & Science University, University of Pennsylvania, University of Pittsburgh, University of Puerto Rico, Meharry Medical College, University of Tennessee, University of Texas at Houston, Virginia Commonwealth University, University of Washington, West Virginia University, and Marquette University.

REFERENCES

Appendix 1. The survey

Management of Information Technology Questionnaire

Name of Person Filling out Questionnaire:

School:

Position:

1. School’s management of decisions to implement Information Technology (IT) in a Centralized Structure (e.g., information technology committee) YES NO
   Decentralized Structure (e.g., dept. level, clinical affairs, etc.) YES NO
   Other:

2. Is IT given a line item in yearly budget? YES NO

3. Does your DENTAL school have any full-time staff devoted to implementation and maintenance of Information Technology? YES NO
   IF YES, how many people?
   IF YES, how many are Dentists? ________ Trained in IT? ________ Other (describe)

4. Do you use University wide resources to manage Information Technology? YES NO
   Describe services (e.g., Medical school resources, health campus resources): 

5. Does school use software programs/products in the following areas (please name vendors):
   Management of applications/admissions decisions? YES NO
   IF YES, NAME OF VENDORS (or developed internally?)
   Management of curriculum for analysis (e.g., CATs)? YES NO
   IF YES, NAME OF VENDORS (or developed internally?)
   Delivery of curriculum content?
   IS THIS DONE FOR THE WHOLE CURRICULUM? YES NO
   IS THIS DONE ON A COURSE SPECIFIC LEVEL? YES NO
   IF YES, NAME OF VENDORS (or developed internally?)
   WHAT TECHNOLOGY IS USED? DVD CD-ROM WEB Live-TV PDAs OTHER:
   Management of Student clinics (appointing/billing)? YES NO
   IF YES, NAME OF VENDORS (or developed internally?)
   Management of Faculty practice (appointing/billing)? YES NO
   IF YES, NAME OF VENDORS (or developed internally?)
   Management of patients in Student clinic (charting/tx plans etc.)? YES NO
   IF YES, NAME OF VENDORS (or developed internally?)
   Management of patients in Faculty clinic (charting/tx plans etc.)? YES NO
   IF YES, NAME OF VENDORS (or developed internally?)
   Grading/Evaluation of students on the clinic floor? YES NO
   IF YES, NAME OF VENDORS (or developed internally?)
   Management of student grades/procedures completed? YES NO
   IF YES, NAME OF VENDORS (or developed internally?)

6. Was your school website development by:
   The Dental School ___ The Medical School ___
   Campus/University ___ External Vendor (Name): __________

7. Does the school have a “multimedia preclinical space”? YES NO
   IF YES, NAME OF VENDORS (or developed internally?)

8. Does the school use simulation in preclinical courses? YES NO
   IF YES, NAME OF VENDORS (or developed internally?)
   IF YES, please state number of units: ___

9. Are your students required to purchase a: LAPTOP PC PDA OTHER

Any other comments/notes:
Appendix 2. Vendor contact information

The following list provides the interested reader with addresses to websites with information regarding the key vendors mentioned in the article.

Information regarding DVD Curriculum:
Vital Source Technologies, Inc. is the current vendor for many schools that have implemented a DVD curriculum, placing course educational resources and textbooks on a DVD. www.vitalbook.com/

Information for vendor contact for software used for management of admissions:
AADSAS and Aclient information access: www.adea.org/AADSAS/default.htm
GSD Quick Recovery: www.quickrecovery.com/index.html
PeopleSoft: www.peoplesoft.com

Information regarding Internet-based curriculum delivery development:
WebCT: www.webct.com/
Blackboard: courseworks.columbia.edu/cms/cu_about/index.html
CourseWorks: courseworks.columbia.edu/cms/cu_about/features.html

Information regarding clinic management software vendors mentioned in the survey:
GSD Quick Recovery: www.quickrecovery.com/index.html
QSI: www.qsii.com/productinfo/dentalsystem.html
Dentech (SoftDent): www.dentech.com
Axium: www.exanacademic.com/
Windent: www.windentsql.com/
Dentrix: www.dentrix.com/
Prodata: www.prodata.com/
Practiceworks: www.practiceworks.com/
Daisy: www.daisydental.com/
Medical Manager: www.medicalmanager.com/products/index.htm
IDX: www.idx.com/