Dental School Applicants’ Use of Website Information During the Application Process

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Abstract: The University of Pittsburgh’s School of Dental Medicine (SDM) is a medium-sized, private, state-related dental school. As other schools have done recently, the SDM made a substantial effort to upgrade its website in 2003. Internal satisfaction and anecdotal data notwithstanding, there is no measure of the website’s usefulness in attracting applicants. We designed an anonymous survey of twenty-one questions in an effort to better understand what kinds of information sources our applicants used to make their application decisions; which information they perceived as useful during each phase of the overall application process; how they ranked our website compared to those of other dental schools that they considered; and what they thought could make our website better. Our study supports the notion that applicants rely in part on dental school websites during the application process. Data from this study point to the areas that are of most interest to applicants when they visit a dental school website. This information could help dental school administrators determine the effort they should spend on their school’s website as an advertising and recruitment tool. We recommend that dental schools make the most important application-related information and criteria easy to find.

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Internal satisfaction and anecdotal data notwithstanding, there is no measure of the website’s usefulness in attracting applicants. This is due in part to the centrally managed application process; all students apply through ADEA’s AADSAS. Though data may be potentially collected on each applicant’s reason for seeking dentistry as a field of study, there is no mechanism for determining how they arrived at their decision to apply to certain schools. Only a few studies have looked at the perceived utility of websites for medical career choices, so that at this point we can only speculate about which promotional tools provide the most useful information in making school-specific application decisions.

We designed this study in an effort to better understand what kinds of information sources our applicants used to make their application decisions; which information they perceived as useful during the various phases of the application process; how they ranked our website compared to those of other dental schools that they considered; and what they thought could make our website better. We also attempted to measure our applicants’ rate of computer use and level of computer literacy to determine if they were able to utilize sophisticated online information resources.

Materials and Methods

We designed an anonymous survey of twenty-one questions (fourteen forced-answer and seven open-ended) subdivided further into the following categories: demographic (two); frequency of visits to dental school websites (two); the SDM website specifically (two); other dental school websites (five); computer literacy (three); and other comments (one). The complete instrument can be seen as PDF at http://di.dental.pitt.edu/applicant-survey/ or see Appendix 1.

The instrument (survey questionnaire) was reviewed by an expert group comprised of three students in the dental informatics master’s program, one dental informatics faculty, and two associate deans for admissions from different schools. Minor corrections were made based on their feedback.

To gauge the applicants’ computer knowledge, we used a validated instrument adapted from Schleyer et al. that presented paired computer terms and asked respondents to what degree they could define the distinction between them on a three-point Likert scale. The scale for each item ranged from 1, representing the applicant’s inability to distinguish between the two computer terms, to 3, representing the applicant’s ability to precisely distinguish between the terms. We retained this question construct, as well as twelve of the sixteen items, from the original survey. Generic, currently applicable items, such as “hardware vs. software” and “electronic mail vs. discussion list,” were kept, while outdated (“data in memory vs. data on disk”) items were replaced. New items included “WiFi connection vs. Firewire connection” and “LCD screen vs. CRT monitor.” Each item was classified as easy, intermediate, or difficult by a three-member expert group (comprised of two dental informatics fellows and one instructional designer). Asking participants to rate their ability to answer questions rather than having them actually answer the questions is, admittedly, an unconventional way of assessing knowledge. We included this design in our voluntary survey because, to some degree, this approach removes the negative emotional associations that students may have with a test situation and it should, therefore, yield more authentic responses and increase the overall response rate.

The instrument was pilot-tested with four current and previous dental school applicants who were not part of the sample. This group suggested no further revisions to the questionnaire and their responses were discarded.

The survey was distributed to 239 of the SDM’s invited applicants during their interview sessions. These sessions were held from November to February 2004 for the 2005-06 academic year. The surveys were included in the applicant packets given to all interviewing applicants during the interview sessions. They were asked to fill out the survey when they had the time, then return them at the end of the day.

We chose only invited applicants rather than all of the 2005-06 applicants to limit our scope to just those students whose application was at least minimally successful at the point of inquiry and to avoid retaliatory or gratuitous responses.

The surveys were collected by staff members not associated with the admission decision, and a research assistant entered the responses into an MS-Excel spreadsheet for evaluation by the investigators. Two investigators coded the answers to the open-ended questions and assigned each to a category (qualitative analysis). In the one case in which they did not agree, a third reviewer was asked to resolve the discrepancy of the choice of category assignment.

Factor analysis was used to extract factors from the test item set. Factor analysis is a multivariate statistical approach that is commonly used to reduce
and summarize sets of related items (e.g., questionnaire items). Factor analysis uses the correlation structure of the set of items to identify the underlying factor structure of those items. Once the factor structure is determined, the factor loading, or correlation of each item with the resulting factor, is determined. The factor loading provides a measure of the relationship between that item and the factor. Thus, items that do not yield a high factor loading are not correlated with the resulting factor. Generally, items loading 0.4 or greater are considered to be the major items comprising the factor. We retained items loading at greater than 0.4 in our final factor solution. We used Cronbach’s alpha as a measure of internal consistency (reliability) of the final factor solution.

The research protocol received exempt status from the University of Pittsburgh’s Institutional Review Board on November 17, 2004 (IRB Number: 0410194).

### Results

The population of 239 invited applicants included 135 male (56.5 percent) and 104 female (43.5 percent). Seven (2.9 percent) belonged to underrepresented minorities (six African Americans and one Native American). Eighty-seven applicants returned a completed survey for a response rate of 39 percent.

On average the responding applicants visited thirteen different dental school websites (standard deviation=6.6). In order to evaluate the utility of these visits with regard to timing of their application, we asked them at what point in the application process they found the websites to be most useful. Fifty-one (59 percent) answered that they perceived the websites to be most useful in the early phase of the application process, twenty-five (29 percent) after the initial selection of schools, ten (11 percent) in preparation of the interview, and one (1 percent) in making the final decision.

All but one of the applicants were aware of the SDM website, and seventy-nine (93 percent) had visited the SDM website before visiting the school for their interview. Five candidates had not visited the website (6 percent), and two candidates did not respond. When asked about the most useful SDM website features, respondents reported that they perceived information on application requirements and details about academic life to be the most useful (Tables 1 and 2).

Fifty-nine respondents (75 percent) stated that their first contact with the SDM was through the website, and twenty (25 percent) mentioned that they had their first contact through other means (a total of seventy-nine candidates responded to this question). Forty-one (52 percent) stated that they contacted someone inside the SDM via email during the application process (thirty-eight [48 percent] did not). Of the candidates who used email to contact the school, thirty-one (79 percent) stated that they had fewer questions because of the information gathered during the website visit. The majority of the applicants (fifty-one [64 percent]) responded that they have visited the SDM website between two and five times, while twenty-four (30 percent) have done so more than five times. The applicants’ reasons for return visits to the SDM website are listed in Table 3.

Fifty-nine applicants (78 percent) perceived the information offered on the SDM website as useful in preparing for the personal interview (a total of seventy-six respondents to this question). When asked what kind of information helped them the most, “general information about the school” was mentioned most often (twelve times) followed by “driving directions and maps” (ten times) and “information about postgraduate programs” (eight times). None of the other information categories were mentioned more than three times.

<table>
<thead>
<tr>
<th>Table 1. Most useful feature on the SDM website</th>
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<tbody>
<tr>
<td><strong>Most Useful Feature</strong></td>
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<tr>
<td>Requirements/application</td>
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<tr>
<td>General information</td>
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<tr>
<td>Prospective student information</td>
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<tr>
<td>Statistics</td>
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</tbody>
</table>

*Total number of responses: 58; list includes only items mentioned more than four times.

<table>
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<tr>
<th>Table 2. Suggested additions to the SDM website</th>
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<tr>
<td><strong>Suggested Additions</strong></td>
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<tr>
<td>Academic life (curriculum details per year, clinic details)</td>
</tr>
<tr>
<td>Statistics about acceptance</td>
</tr>
<tr>
<td>Facility information (pictures, multimedia)</td>
</tr>
<tr>
<td>Statistics on board pass/fail/scores</td>
</tr>
</tbody>
</table>

*Total number of responses: 58; list includes only items mentioned more than three times.
Applicants were asked which websites other than the SDM’s satisfied their information needs best—a question that then led to the next question that asked them to list the kind of information they used to compare different schools. Information on tuition, entering class statistics (DAT/GPA), general admissions requirements and acceptance rate, and diversity were cited most frequently. It is important to note that the proportion of applicants citing diversity as a key factor (11/67) differs significantly from the proportion of URM interviewees (7/239) ($c^2=17.20, p<.0001$).

We asked the applicants to recall an instance when the information on another dental school’s website led them to apply to that particular school. Only twenty-two respondents could identify such a decisive moment. “Acceptance rate” (four times) and “postgraduate programs” (three times) were the only answers mentioned more than twice.

Finally, we wanted to know the relative worth of web-based information versus other sources of information in making application decisions. We asked the applicants to choose the statement below that best described their situation. Responses and rates are included in parentheses.

- I mainly used other information sources and only briefly looked up information on the schools’ websites: 21 (27 percent).
- I based my decision on approximately equal amounts of information from dental schools’ websites and from other sources: 31 (40 percent).
- My decision was based predominantly on comparing information offered on dental schools’ websites. Only at the end did I use other information resources: 17 (22 percent).
- I based my decision almost entirely on the information that I found on the dental schools’ websites. School visits and interviews are experiences that only complement my web-based research: 9 (12 percent).

To assess computer knowledge, we asked admissions candidates to rate their ability to define the distinction between sixteen paired computer terms. Answer choices ranged from “I don’t understand the distinction at all” (=1) to “I can define the distinction precisely” (=3). Descriptive statistics for each item are presented in Table 4 where higher numbers in the “Mean” column reflect greater knowledge confidence than lower numbers. Responses from seventy-nine candidates were included in the analysis. Factor analysis supported a one-factor solution, with two items loading less than 0.4 for the single factor (Table 4). Those items were dropped from the final factor solution. The factor explained 9.52 percent of the total variance. The reliability (Cronbach alpha) of the scale was 0.89.

The average of hours of computer use during the last year of the respondents’ college education for school-related purposes per week was 12.6 hours. The majority of respondents (80 percent) answered that they used the web for school-related purposes during the last year of their predental college education more than five times in a typical week. Only one person indicated that “typically, I didn’t use the web.”

### Discussion

Applicants rely on dental school websites to gather and receive information during the application process. Our analysis of computer knowledge and computer usage showed that our applicants have the appropriate sophistication to use a complex web-based information resource. Because 75 percent of the applicants made their first contact through the school’s website, concentrating recruitment resources on web-based information would likely maximize applicant attention. Since the SDM and other dental schools can only make one first impression, it should represent the school’s best effort.

Approximately half of the applicants had email contacts with persons in the school at some point during the application process. We recommend providing easy access to the email addresses of the SDM’s admissions officers, as well as other faculty and administrators, even if this means increasing exposure of these email addresses to spam along with authentic inquiries. Providing personal contacts should encourage more correspondence and foster the development of personal relationships throughout the admissions process.
Not surprisingly, our applicants ranked tuition as the primary criterion for comparing dental schools. This is similar to findings from previous studies of factors that most influence matriculation.\textsuperscript{11} We recognize that school administrators cannot change their university-determined tuition rates, but other items used by applicants to compare schools are important to note. Statistics on the GPA and DAT of the last incoming class seem to be the second most interesting criteria to our applicants, followed by admission requirements and diversity of student body, respectively. In order to serve applicants’ information needs well, dental schools should provide easy access to the admissions-related data that is most desired by candidates.

A number of candidates indicated that diversity was a key factor that they considered when comparing schools. Studies have shown that URM applicants (especially African American) feel more welcome if the student population includes other minority students.\textsuperscript{2} If we assume that diversity means the presence of URM students, and considering the few URM applicants in our sample population for this study, it seems that non-URM students also seek diversity. This suggests that increasing student diversity in dental education, an expressed goal of the ADA and ADEA, may help to increase overall dental school applicants.

Data from this study point to the areas of most interest to SDM applicants when they visit a dental school website, such as tuition and the statistics on the entering class. The findings from this study could help dental school administrators determine the effort they should spend on their school’s website as an advertising and recruitment tool. While these data are not generalizable and are based on responses from only 39 percent of our total potential sample, we recommend that other dental schools look at what was useful to our applicants in light of their own websites.

### Limitations

The relatively low response rate leaves opportunity for response bias; however, we think that it is mainly due to the hectic schedule on the interview day that did not allow the interviewees enough time to spend on the survey.

We acknowledge that this study measures only the applicants’ perceived value of the SDM website as a recruitment tool and may bear no relationship to application rates. Applicants were also asked to recall thoughts and behaviors during what may have been a stressful situation (personal interviews) with possible negative effects on the accuracy of recall. Lastly, though we made a point to tell them other-

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**Table 4. Computer knowledge based on the ability to distinguish paired terms (items sorted by factor loading)**

<table>
<thead>
<tr>
<th>Difficult*</th>
<th>Mean**</th>
<th>SD</th>
<th>Factor Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client vs. server</td>
<td>I</td>
<td>2.18</td>
<td>0.76</td>
</tr>
<tr>
<td>Voice-input vs. digital recording</td>
<td>E</td>
<td>1.68</td>
<td>0.75</td>
</tr>
<tr>
<td>Palm PDA vs. Pocket PC</td>
<td>I</td>
<td>1.98</td>
<td>0.82</td>
</tr>
<tr>
<td>Digital vs. analog</td>
<td>I</td>
<td>2.24</td>
<td>0.75</td>
</tr>
<tr>
<td>Operating system vs. application program</td>
<td>I</td>
<td>2.12</td>
<td>0.78</td>
</tr>
<tr>
<td>Images vs. graphics</td>
<td>I</td>
<td>2.15</td>
<td>0.68</td>
</tr>
<tr>
<td>Electronic mail vs. discussion list</td>
<td>I</td>
<td>2.25</td>
<td>0.76</td>
</tr>
<tr>
<td>Modem vs. network connection</td>
<td>I</td>
<td>2.58</td>
<td>0.52</td>
</tr>
<tr>
<td>Wifi connection vs. FireWire connection</td>
<td>D</td>
<td>1.56</td>
<td>0.74</td>
</tr>
<tr>
<td>Data on a CD vs. data on DVD</td>
<td>E</td>
<td>2.32</td>
<td>0.7</td>
</tr>
<tr>
<td>Internet vs. WWW</td>
<td>I</td>
<td>2.15</td>
<td>0.78</td>
</tr>
<tr>
<td>LCD screen vs. CRT monitor</td>
<td>D</td>
<td>1.87</td>
<td>0.8</td>
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<tr>
<td>Full-text database vs. bibliographic database</td>
<td>D</td>
<td>2.01</td>
<td>0.79</td>
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<tr>
<td>Hardware vs. software</td>
<td>E</td>
<td>2.67</td>
<td>0.52</td>
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<tr>
<td>Digital radiography vs. radiograph digitalization</td>
<td>I</td>
<td>1.64</td>
<td>0.75</td>
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<tr>
<td>MEDLINE vs. Internet search engine</td>
<td>I</td>
<td>2.24</td>
<td>0.77</td>
</tr>
</tbody>
</table>

*Difficulty: E=easy; I=intermediate; D=difficult
**Answer choices: I don't understand the distinction at all=1; I have a general appreciation of the distinction but couldn't define it=2; I can define the distinction precisely=3
wise, the applicants may have thought that their responses would influence their chances of acceptance. This could have biased their responses.

Surveying all prospective dental students, those who applied and those who decided not to apply to the SDM, would be the optimal target population of this study. We decided to survey the SDM’s invited applicants only, due to the inaccessibility of the nonapplicant group. Further, our study looks at only one of the website’s target audiences: applicants to the predoctoral program. Other audiences include postdoctoral students, patients, alumni, and dental professionals in general.

Answers to questions about other schools must be evaluated with caution since applicants to the University of Pittsburgh might apply only to certain other schools (based on shared demographics, institutional ranking, and certainly cost) and not to all possible dental schools with the same probability. In this case, when respondents compare the SDM website to other schools or rank other schools’ websites, they are most likely not evaluating all inclusive.

We only assume that the call for diversity by our applicants means the presence of URM students, but “diverse” could also refer to the inclusion of women or international students. Finally, because we elected to use an anonymous response approach, we cannot determine if responders differ from nonresponders in characteristics like gender and race.

Acknowledgments

The authors would like to thank the applicants to the University of Pittsburgh, School of Dental Medicine for their contribution to our study. Further gratitude goes to the experts who reviewed the survey instrument, to Terri Leofsky from the Center for Dental Informatics for data entry, and to Andrea Hyde from the School of Education for writing consultation and editing on this manuscript. Titus Schleyer, the director of the Center for Dental Informatics at the School of Dental Medicine, University of Pittsburgh, provided many helpful comments to the draft of the manuscript. Finally, we would like to thank Dr. Peter Embi, with whom we had an inspiring discussion during the 2003 Annual Symposium of the American Medical Informatics Association, which led in part to this study. Furthermore, we would like to express our gratitude to the tremendous help we received from the anonymous reviewers.

REFERENCES

APPENDIX 1

QUESTIONNAIRE

Please complete the following questions.

1. In the past 12 months, I have visited _____ dental school websites.

   If you answered “0”, please stop here and return the survey.

2. At what point in the application process did you find dental schools’ websites most useful?

   Check only one:

   [ ] early phase
   [ ] after my initial selection of schools
   [ ] in preparation of the interview
   [ ] in making the final decision

A: University of Pittsburgh, School of Dental Medicine’s Website

3. Are you aware that the School of Dental Medicine (SDM) has a website?

   [ ] yes  [ ] no

   If yes, have you visited the website during the application process before you came to this interview?

   [ ] yes  [ ] no

   If you answered “no,” please continue with question 11.

4. What is the most useful feature/information on our website?

   Name only one: _______________________________

   (☐ Check here if none was useful.)

5. What is the least useful feature/information on our website?

   Name only one: _______________________________

6. What kind of features/information would you like to see added to our website?

   ____________________________________________________________________
   ____________________________________________________________________
   ____________________________________________________________________
   ____________________________________________________________________

7. Did you check out our website before requesting any other information by mail, phone, email, etc.?

   [ ] Yes, my first contact was via website.  [ ] No, my first contact was via other means.

8. Did you contact anybody at the SDM via email during the application process?

   [ ] yes  [ ] no

   If yes, do you feel that you had fewer questions because you had visited the SDM website already?

   [ ] yes  [ ] no

9. In the past twelve months, how often did you visit the SDM website?

   [ ] one time only  [ ] between 2 and 5 times  [ ] more than 5 times

   If more than once, what was the main reason to come back?

   Name only one: _______________________________

10. Did you find any useful information on our website while preparing for your visit today?

     [ ] yes  [ ] no

     If yes, which information was the most useful: _______________________________
B: OTHER Dental Schools’ Websites

In the following section, please refer to any dental school’s website, OTHER THAN the SDM website.

11. Which school’s website satisfied your information needs best?
   Name only one school: _______________________________

12. In comparing different schools, what kind of information from their websites did you use?
   (tuition, level of diversity, student-teacher ratio, etc.)
   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________

13. In addition to application details, what kind of information do you expect to find on a dental school’s website?
   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________

14. Please try to recall if there was an instance where you found important information on a dental school’s website that
    led you to decide to apply to that particular school.
   ___________________________________________________________________

15. In regard to your decision to apply to a particular dental school(s), which statement would describe your situation best?
    Select only one:
    □ I mainly used other information sources and only briefly looked up information on the schools’ websites.
    □ I based my decision on approximately equal amounts of information from dental schools’ websites and from
      other sources.
    □ My decision was based predominantly on comparing information offered on dental schools’ websites.
      Only at the end did I use other information resources.
    □ I based my decision almost entirely on the information that I found on the dental schools’ websites.
      School visits and interviews are the experiences that only complement my web-based research.

C: Your Computer Literacy

16. During the last year of your college education how many hours, in a typical week, did you use a computer for
    school-related purposes?
    ________ hours/week

17. In a typical week, on how many occasions did you use the web for school-related purposes during the last year
    of your predental college education?
    □ 14 times or more/week
    □ 9-13/week
    □ 5-8/week
    □ 1-4/week
    □ Typically, I didn’t use the web.
18. Below is a set of paired terms that relate to computers. Please score your knowledge of the distinction between the terms in each pair, using the following scale:

1. I don't understand the distinction at all
2. I have a general appreciation of the distinction but couldn't define it.
3. I can define the distinction precisely.

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<td>3</td>
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<tr>
<td>LCD screen vs. CRT monitor</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

19. I am [ ] Male  [ ] Female.

20. My age is ____ years.

21. Please use the space below (and the back of this page if necessary) to list any other comments you may have related to this questionnaire:

___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________

Thank you for completing this questionnaire!