Perceptions of Computer Literacy Among Occupational Therapy Students

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Key Words: education • technology

Objective. Educational programs for the occupational therapist and the occupational therapy assistant are mandated to include content on technologies in their curricula. Given the increasing use of technology skills among occupational therapists, especially computer technology skills, it seemed judicious to ascertain the current and desired levels of skill of occupational therapy students as well as their opinions about computer technology.

Method. Program directors from five baccalaureate-level curricula distributed the Computer Opinion Survey and the Computer Knowledge Survey to 109 junior and senior occupational therapy students. The students were instructed to complete and return questionnaires to their program directors who, in turn, forwarded the questionnaires to the principal investigators.

Results. Respondents were generally positive about computer technology, and the level of knowledge they desired about computer technology applications in occupational therapy was much greater than their current level of knowledge. Although respondents' positive attitudes were significantly correlated with their current levels of computer knowledge, no significant relationship was established among positive attitudes, current levels of computer knowledge, and number of computer courses completed before entering an occupational therapy curriculum.

Conclusions. Even though the respondents were computer literate (i.e., they had a general working knowledge of the uses, limitations, and impact of computers), no relationship was established between their previous computer course work and their current knowledge of the use of computer technology in occupational therapy. The linkage between generic computer literacy and knowledge of its relationship to the use of computer technology in occupational therapy was not evident to this sample of junior and senior students.

In its 1991 Essentials and Guidelines for an Accredited Educational Program for the occupational therapist and the occupational therapy assistant, the American Occupational Therapy Association (AOTA) mandated that content on technologies be included in occupational therapist and occupational therapy assistant curricula (AOTA, 1991a, 1991b). An AOTA position paper on occupational therapy and assistive technology defines some of the technologies used by occupational therapists in terms of the federal definition of assistive technology devices (ATDs) and describes them as "any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities" (Technology-Related Assistance for Individuals With Disabilities Act of 1988 [Public Law
Anson, 1994; Bates, Spencer, Young, Smith, 1993; Powell, 1994; Smith, 1993). Technology aids; vehicle modifications; and wheeled mobility. Given the increased use of technology in current occupational therapy practice (Angelo, 1992; Angelo & Smith, 1993; Anson, 1994; Bates, Spencer, Young, & Rintala, 1993; Bay, 1991; Buning & Hanzlik, 1993; Holm & Rogers, 1991; Lau & O'Leary, 1993; Pedretti et al., 1992; Post, 1993; Rogers & Holm, 1991; Shuster, 1993; Smith, 1993; Swinth, Anson, & Deitz, 1993), it is not surprising that 88% of the survey respondents indicated that introductory-level technology skills should be included in entry-level occupational therapy curricula.

Although 11 areas were specified, computer technology content constituted 25.5% of required content in technology and 41.9% of elective content in technology in the 59 programs that responded to the survey, the largest percentages of both required and elective technology content in occupational therapist curricula (Kanny et al., 1991). In current practice, computer technology can be used for patient evaluation and intervention as well as to gain easy access to patient databases, develop computerized patient care and discharge plans, access product databases and rehabilitation technology suppliers, participate in distance learning, and communicate with other professionals via the Internet (Anson, 1994; Hammel & Smith, 1993; Powell, 1994; Smith, 1993). Technology competencies for preservice training (e.g., occupational therapy educational curricula) and continuing education, including computer technology competencies, have been developed by the AOTA Technology Special Interest Section (Hammel & Smith, 1993).

We reasoned, however, that to provide students with the ATD learning experiences needed to become competent users of computer technology, occupational therapy educators must first evaluate the computer literacy skills of their students and faculty members. Computer literacy, which is defined as the extent to which a person has a general working knowledge of the uses, limitations, and impact of computers, could soon be considered a prerequisite skill that occupational therapy students must have to compete and survive in occupational therapy curricula as well as in a society that increasingly depends on computer technology (Montag, 1984; Hammel & Smith, 1993).

The purpose of this study was to (a) describe entry-level occupational therapy students’ opinions about computer technology, (b) compare students’ perceptions of their current and desired knowledge of computer applications in occupational therapy, and (c) examine the relationship among opinions about computer technology, current and desired knowledge of computer applications, and the number of semesters of computer technology courses completed (i.e., level of computer literacy).

Method

This study is part of a larger study on computer literacy among allied health students. A random sample of nine baccalaureate entry-level occupational therapy programs (seven state universities and two private liberal arts colleges) was selected from a directory of accredited schools offering these programs (Peterson Guide Publishing Company, 1993). Data were collected with two survey instruments, which were mailed to entry-level program directors who were requested to administer the questionnaires to their students and return the completed surveys to the second author. Part I of the survey contained questions regarding general attitudes about computers; Part II contained questions about current and desired levels of knowledge about computer applications in the field of occupational therapy. Data were also collected about respondents’ enrollment status (junior or senior), age, gender, race, number of required computer courses taken, access to computers at school or home, and types of software regularly used. A cover letter was attached to the surveys explaining the objective of the study and soliciting voluntary participation. The program directors of five occupational therapy programs administered the questionnaires to their students and returned the completed questionnaires to the second author, representing a 56% return rate.

Respondents

The sample included 109 occupational therapy students; 27 (24.77%) were juniors and 82 (75.23%) seniors. The mean age of the respondents was 24 years; 15 (13.76%) were men and 94 (86.24%) were women. Ninety-eight respondents (90.00%) were European-American, 8 (7.34%) African-American, 1 (.92%) Hispanic, 1 (.92%) Asian-American, and 1 (.92%) Native American.

Eighty-four (77.06%) respondents had taken a computer literacy course, with 33 (39.29%) of those respondents indicating that the course was required. In response to the question on the number of computer courses taken, 14 (12.84%) respondents reported having taken less than one course over a semester, 49 (44.95%) had
one course, 18 (16.51%) had two courses, 3 (2.75%) had three courses, and 2 (1.83%) had more than three courses. Eighty-one (74.31%) respondents reported having access to a computer and 97 (88.99%) reported a working knowledge of commonly used word processing and spreadsheet applications.

**Instrument**

Two instruments were used for data collection. The Computer Opinion Survey (COS) (Mauser & Simonson, 1984) was used to assess general opinions toward computer technology. The COS is a 26-item tool designed to assess the extent to which respondents agree with statements such as “I feel very negative about computers in general” and “If I use a computer, I could get a better picture of the facts and figures.” Each statement is rated with a 6-point scale that ranges from 1 (very low) to 6 (very high). The reliability and validity of the instrument has been demonstrated in previous studies (Mauser & Simonson, 1984; Montag, Simonson, & Mauser, 1984; Thomas, 1985). In this study, the 26 items loaded on a single factor, and the instrument achieved an acceptable Cronbach’s index of internal consistency of 0.94.

The second instrument used in this study was a modified version of the Computer Knowledge Survey (CKS) (Parks, Damrosch, Heller, & Romano, 1986). The CKS is a 20-item tool designed to have respondents self-assess their current and desired levels of computer knowledge in three general areas: how computers function, issues of privacy and confidentiality, and computer applications in their chosen field of study. Respondents rate their current and desired knowledge for each item on a 5-point scale that ranges from 1 (very low) to 5 (very high). Cronbach’s index of internal consistency of the scale was 0.95.

**Results**

**Opinions About Computer Technology**

Descriptive statistics of respondents’ opinions about computer technology (COS) are presented in Table 1. Fourteen items (5, 7, 9, 11, 12, 14, 18, and 19–25) were stated in the negative and were therefore recoded so that for reporting purposes, lower means would reflect positive opinions and higher means would indicate negative opinions. Item means ranged from 1.44 to 3.42, with an overall mean of 2.22, indicating that respondents’ opinions were generally positive about computer technology.

Table 1

<table>
<thead>
<tr>
<th>Item</th>
<th>Statement</th>
<th>Range</th>
<th>M</th>
<th>SD</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Having a computer available to me would improve my productivity.</td>
<td>1–6</td>
<td>1.66</td>
<td>0.98</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>If I have to use a computer for some reason, it would probably save me some time and work.</td>
<td>1–6</td>
<td>1.73</td>
<td>0.88</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>If I use a computer, I could get a better picture of the facts and figures.</td>
<td>1–6</td>
<td>2.47</td>
<td>1.05</td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td>Having a computer available to me would improve my general satisfaction.</td>
<td>1–6</td>
<td>2.28</td>
<td>1.11</td>
<td>16</td>
</tr>
<tr>
<td>5</td>
<td>Having to use a computer could make my life less enjoyable.</td>
<td>1–6</td>
<td>2.06</td>
<td>1.08</td>
<td>12</td>
</tr>
<tr>
<td>6</td>
<td>Having a computer available to me could make things easier for me.</td>
<td>1–6</td>
<td>1.88</td>
<td>0.90</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>I feel very negative about computers in general.</td>
<td>1–6</td>
<td>1.95</td>
<td>1.17</td>
<td>8</td>
</tr>
<tr>
<td>8</td>
<td>Having a computer available to me could make things more fun for me.</td>
<td>1–6</td>
<td>2.61</td>
<td>1.25</td>
<td>23</td>
</tr>
<tr>
<td>9</td>
<td>If I had a computer at my disposal, I would try to get rid of it.</td>
<td>1–6</td>
<td>1.44</td>
<td>0.79</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>I look forward to a time when computers are more widely used.</td>
<td>1–6</td>
<td>2.51</td>
<td>1.19</td>
<td>22</td>
</tr>
<tr>
<td>11</td>
<td>I doubt if I would ever use computers very much.</td>
<td>1–6</td>
<td>1.90</td>
<td>1.04</td>
<td>6</td>
</tr>
<tr>
<td>12</td>
<td>I avoid using computers whenever I can.</td>
<td>1–6</td>
<td>2.12</td>
<td>1.27</td>
<td>13</td>
</tr>
<tr>
<td>13</td>
<td>I enjoy using computers.</td>
<td>1–6</td>
<td>2.31</td>
<td>1.15</td>
<td>17</td>
</tr>
<tr>
<td>14</td>
<td>I feel that there are too many computers around now.</td>
<td>1–6</td>
<td>2.05</td>
<td>1.15</td>
<td>11</td>
</tr>
<tr>
<td>15</td>
<td>Computers are probably going to be an important part of my life.</td>
<td>1–6</td>
<td>1.99</td>
<td>0.92</td>
<td>9</td>
</tr>
<tr>
<td>16</td>
<td>A computer could make learning fun.</td>
<td>1–6</td>
<td>2.04</td>
<td>0.92</td>
<td>10</td>
</tr>
<tr>
<td>17</td>
<td>If I were to use a computer, I could get a lot of satisfaction from it.</td>
<td>1–6</td>
<td>2.31</td>
<td>1.00</td>
<td>17</td>
</tr>
<tr>
<td>18</td>
<td>If I had to use a computer, it would probably be more trouble than it was worth.</td>
<td>1–6</td>
<td>2.16</td>
<td>1.05</td>
<td>14</td>
</tr>
<tr>
<td>19</td>
<td>I am usually uncomfortable when I have to use computers.</td>
<td>1–6</td>
<td>2.99</td>
<td>1.48</td>
<td>24</td>
</tr>
<tr>
<td>20</td>
<td>I sometimes get nervous just thinking about computers.</td>
<td>1–6</td>
<td>2.39</td>
<td>1.26</td>
<td>19</td>
</tr>
<tr>
<td>21</td>
<td>I will probably never learn to use a computer.</td>
<td>1–6</td>
<td>1.60</td>
<td>0.83</td>
<td>2</td>
</tr>
<tr>
<td>22</td>
<td>Computers are too complicated to be of much use to me.</td>
<td>1–6</td>
<td>1.94</td>
<td>1.04</td>
<td>7</td>
</tr>
<tr>
<td>23</td>
<td>If I had to use a computer all the time, I would probably be very unhappy.</td>
<td>1–6</td>
<td>2.47</td>
<td>1.37</td>
<td>20</td>
</tr>
<tr>
<td>24</td>
<td>I sometimes feel intimidated when I have to use a computer.</td>
<td>1–6</td>
<td>3.14</td>
<td>1.51</td>
<td>25</td>
</tr>
<tr>
<td>25</td>
<td>I sometimes feel that computers are smarter than I am.</td>
<td>1–6</td>
<td>3.42</td>
<td>1.45</td>
<td>26</td>
</tr>
<tr>
<td>26</td>
<td>I can think of many ways that I could use a computer.</td>
<td>1–6</td>
<td>2.20</td>
<td>1.13</td>
<td>15</td>
</tr>
</tbody>
</table>

*Negative statements were recoded to match the scoring scheme of positive statements; therefore, lower means indicate more positive opinions (respondents strongly disagreed with the statement), and higher scores indicate more negative opinions.

*Rank indicates the most positive response (1) to the most negative response (26).
The total possible score on the COS was 156, and after recoding, respondents' scores ranged from 28 to 122, with a mean of 57.60. The 10 items with the lowest means (strongest agreement with the statements) indicated that respondents agreed that computers are valued, easy to learn, could improve productivity, and could probably save time and work.

**Computer Knowledge: Current and Desired Levels of Knowledge**

Results of the comparison between current and desired levels of computer knowledge (CKS) are presented in Table 2. Because of multiple t-test comparisons, a Bonferroni correction was used (Shott, 1990). Therefore, an unadjusted p value of .0025 was required for an alpha level of p < .05 (i.e., .05/20 comparisons = .0025). Significant differences were established between respondents' perceived current knowledge and their desired knowledge of computers for all 20 items of the CKS. In each instance, respondents' desired levels of computer knowledge were significantly higher than their current level of computer knowledge. Out of a possible total of 100 points, the respondents' mean total score was 50.70 for perceived current knowledge and 83.32 for desired level of knowledge.

**Discussion**

This study investigated occupational therapy students' attitudes toward computers and their evaluation of potential gaps between their current and desired levels of computer knowledge. Relationships among computer lit-
eral, perceived current levels of computer knowledge, and attitudes toward computers were also investigated. The results suggest that the occupational therapy students surveyed were generally enthusiastic about computer technology and were aware of the positive impact computers can have on their professional lives. Considering the average age of the students surveyed, this result is not surprising because students graduating from high school within the past 10 years have had more exposure to computers in high school and even grade school.

Consistent with the findings obtained in studies of nursing students (Delaney, 1989; Feeg, 1984; Felton & Brown, 1985; Litwack, Linc, & Bower, 1985; Parks et al., 1986; Thomas, 1985), these occupational therapy students perceived themselves as having low levels of knowledge of computer applications in their field. They also expressed a strong desire to increase their computer knowledge. According to our findings, gaps between current and desired knowledge of computer applications in occupational therapy for which computer literacy instruction would be most appropriate include (a) computer applications in patient care, (b) impact of computer technology on health care costs and treatment outcomes, (c) potentials and limitations of computer technology, (d) uses of computers, and (e) basic components of a computer. These results are consistent with technology content identified in the foundation computer technology preservice (education program) competencies developed by the AOTA Technology Special Interest Section (Hammel & Smith, 1993).

The results of this study, however, suggest that taking computer courses before entering an occupational therapy curriculum is not significantly related to increased computer knowledge relevant to occupational therapy. What is unknown, however, is the type of content included in the computer courses the respondents had taken. Another limitation of the study is the ability to generalize to the type of institutions the respondents were enrolled in, or the total number of students who received the surveys versus those who completed them (actual response rate). After removing the surveys from the envelopes and entering the data (which were not coded by institution to protect the anonymity of the respondents), the research assistant destroyed the envelopes, precluding specific identification of the five responding curricula. Hence, we are unable to make any statements about the type of institutions the respondents attended, which limits generalizability of the results. For the 109 respondents to the COS and CKS, however, there was a moderately strong and significant relationship between their current level of computer knowledge and the positive nature of their attitudes toward computer technology. Even though the respondents were literate in commonly used word processing and spreadsheet applications, they did not acknowledge a significant relationship between their previous computer course work and their current knowledge of the use of computer technology in the occupational therapy profession. Somehow, the linkage between generic computer literacy and the use of computer technology in occupational therapy was not apparent to this sample of junior and senior students.

Measures that may facilitate the linkage between generic computer literacy and knowledge of the use of computer technology in occupational therapy include the adoption of common computer literacy competencies as prerequisites for admission to occupational therapy educational programs. For example, if literacy in word processing, data management, and graphics programs were prerequisites for admission, basic concepts would not have to be taught before occupational therapy applications of computer technology are introduced. Students' perceived knowledge of computer applications in occupational therapy (see Table 2, CKS item 4) might be greater with increased availability of computer technology: presentation of computer applications throughout the professional curriculum, use of computer technology during clinical rotations, and increased faculty member proficiency in computer technology applications necessary for the current practice of occupational therapy (Hammel & Smith, 1993; Kanny et al., 1991).

Summary

Occupational therapy students from five baccalaureate programs were surveyed about their opinions toward computer technology and their perceptions of current and desired levels of knowledge about computer technology applications in the field of occupational therapy. The respondents were generally positive about computer technology, and the level of knowledge they desired about computer technology applications in occupational therapy was significantly greater than their current level of knowledge. Although respondents' positive attitudes toward computer technology were significantly correlated with their current levels of computer knowledge, no significant relationships were established between positive attitudes toward computer technology and number of computer courses completed before entering an occupational therapy curriculum or between current levels of computer knowledge and number of courses taken.

References

American Occupational Therapy Association. (1991a). Essen-


