Workplace culture and accessibility of the Internet for professional learning

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Abstract: The World Wide Web is an important information source for professionals providing immediate access to the most current information and recent research. This study examined accessibility to the Internet within healthcare workplaces by utilising two measures, namely computers with Internet access within the workplace, and practitioners’ reported ease of access to the Internet within their workplace. This study showed there is widespread variation in both computers with Internet access within workplaces and also practitioners’ perception of their ease of access to the Internet within the workplace. This study also identified that limiting Internet access to computers in offices reduced ease of access to the Internet for the majority of practitioners, and in particular the recent graduate. Issues reducing accessibility of the Internet within workplaces must be addressed so that health practitioners can avail themselves of Internet-based resources that support them in updating their professional knowledge.

Introduction

The Internet is now ubiquitous throughout society, and its use as a source of continually updated professional knowledge is a key factor in professional learning and development in most professional workplaces. However, access to this important resource is still quite variable, and even if Internet-connected computers exist in workplaces, they are often not easily accessible by professionals. Issues related to perception of time off-task, professional mores, and workplace culture can militate against appropriate and critical access to professional knowledge when it is most needed. In this paper, we examine both the physical and cultural access to the Internet in the professional workplaces of medical imaging workers – a growing field with a dynamic and fast expanding knowledge base.

As for many professions, the health care system is in a state of constant and rapid change as a result of the increase in scientific knowledge and rapid technological advances. Health practitioners must continue to learn throughout their working life so they can keep abreast of technological advances and provide the best possible healthcare (Maslin-Prothero, 1997). The requirement for health practitioners to remain up-to-date with the changing knowledge base of their profession is now being formally recognised by health professions with the introduction of mandatory Continuing Professional Development (CPD) requirements for practitioners (Madewell, 2004; Maslin-Prothero, 1997; Rouse, 2004; Weindling, 2001; White, 2004). To update professional knowledge health practitioners must have access to the information sources that contain the knowledge base of their profession. The Internet is an important information source for health practitioners offering immediate access to the most current health and medical information. Web sites of professional, government, education and commercial organisations provide access to online journals,
health and medical databases, practice guidelines as well as information on professional development activities (Bennett, Casebeer, Kristofco, & Strasser, 2004; Masters, 2008; Gilmore, Scott & Huntington, 2008; Nail-Chiwetalu & Ratner, 2006; Shanahan, Herrington, & Herrington, 2008). Internet based communication tools of e-mail, listservs and discussion forums are used by health practitioners to consult with colleagues nationally and internationally (Bennett et al., 2004; Herrington & Herrington, 2006; Masters, 2008; Shanahan et al., 2008).

While the Internet offers many resources to health practitioners that support and update their professional practice, factors limiting access to the Internet have been identified. Recent studies demonstrate that access to the Internet in the workplace is not universal amongst Australian health practitioners. Herrington and Herrington (2006) investigated the use of the Internet to meet the professional learning needs of rural and remote health and education practitioners in Australia (n =1267). In this study access to the Internet was shown to vary both across and within health professions. Factors identified in this study that limit access to the Internet included low numbers of computers with Internet access, imposed access restrictions such as no or limited access to external websites and lack of time during work hours to search for information. A recent study of health professionals in Western Australia showed that Internet access varied across geographic boundaries and also across professions (Shaw, Lundy, & Larsen, 2006). In this study, whilst rural nurse practitioners reported higher levels of Internet access in their department (85%) than their colleagues in metropolitan locations (67%), this was not the case for medical practitioners, with all medical practitioners in metropolitan locations reporting departmental Internet access compared to 91% of their rural colleagues. Differential access to the Internet across geographic boundaries was also identified in a study of Australian occupational therapists by Taylor and Lee (2005). In this study rural occupational therapists were shown to have lower levels of access to the Internet within their department (90%) than their metropolitan colleagues (96%). Klotz and Reis (2005) explored access to and use of computer technologies by Remote Area Nurses (n=43). Whilst all respondent nurses reported they had physical access to computers and the Internet either at work or at home, 68% of respondents indicated they were required to seek management approval before accessing a computer at work.

A review of the literature indicates that Australian health practitioners experience physical access restrictions within their department (e.g., the number of computers with Internet access), organisationally imposed Internet-access restrictions (e.g. permission) and lack of time to access the Internet. These findings of restricted access to the Internet in Australian departments are in accord with other international studies that have identified lack of physical access to the Internet within departments (Estabrooks, O'Leary, Ricker, & Humphrey, 2003); lack of access to external websites (Gilmore et al., 2008) and lack of time to search and read information (Gilmore et al., 2008; Masters, 2008; Nail-Chiwetalu & Ratner, 2006) as limiting health practitioners access to and use of health information available through the Internet.

Accessibility to information sources is a complex phenomenon. Common indicators of accessibility include physical proximity to the information source and ease of access to the information source (Fidel & Green, 2004). A review of the literature did not identify any study that examined both physical access to the Internet within workplaces and health practitioners’ ease of access to the Internet. The literature review suggests that practitioners’ ease of access to the Internet will be negatively impacted if workplace culture imposes additional Internet access restrictions such as withholding permission to the use the Internet, despite computers with Internet access being present within the workplace. This study examines accessibility to the Internet within healthcare workplaces by utilising both common indicators of accessibility, namely computers with Internet access within the workplace and practitioners’ reported ease of access to the Internet within their workplace.
The Study

The profession
The health profession studied was Medical Imaging Workers (MIWs), which includes Radiographers, Radiation Therapists, Nuclear Medicine Technologists and Sonographers (AIHW, 2003). There were over 8000 Medical Imaging Workers in Australia in 2001 (latest available national data) and this occupation had experienced a 25% increase in workforce numbers between 1996 and 2001 (AIHW, 2003). Similar to other health professions, Medical Imaging is experiencing technological and professional change (AIR, 2004; SOR, 2007) and the need for MIWs to stay up-to-date with the changing knowledge base of their profession has been recognised (ANZSNMT, 2001) or mandated (MRPBV, nd; MRTBNZ, 2007; MRTBQ, 2003; AIR, 2004; Pickersgill, 2007) by professional societies and registration bodies in Australia and internationally. This study is timely not only for the profession in view of the current focus on mandatory continuing professional development for MIWs worldwide, but for the human service professions generally.

Aim of the study
The content of this paper forms part of a larger study investigating the information sources used by Australian MIWs to update their professional knowledge and practitioners’ accessibility to and use of these information sources. This paper reports on workplace accessibility of the Internet.

Methodology
Survey methodology was used to collect data for this study. In 2007, a questionnaire was mailed to a sample of 1067 Australian MIWs. The sample included 537 practitioners holding registration with the Victorian Medical Radiation Technologists Board (MRTB) using a 20% random sample and 530 practitioners holding registration with the Queensland MRTB (50% random sample of registrants with their addresses publicly available on the Queensland MRTB register). The questions of relevance to this paper explored the availability of computers in the workplace that have Internet access, and how readily accessible these computers were, both physically and culturally within the workplace environment.

The survey data were entered into SPSS 15.0® and descriptive and inferential statistics were used for analysis. Percentages were used to describe survey findings. The collected data allowed for cross tabulations to be performed on computers with Internet access and ease of access to the Internet across workplaces to determine if associations existed. Differences between groups were examined using chi-square analysis using Fisher’s exact test.

Results
Of the initial 1067 questionnaires mailed, 39 were excluded due to incorrect addresses. A total of 320 completed questionnaires were returned with a response rate of 31.1%. This response rate is greater than other recent surveys of Australian MIWs (14.5 – 27.6%) (Cowell & Parkinson, 2006; Sim, 2003). Demographic data analysis showed that the respondent population was similar to the Australian population of MIWs for area of specialisation and gender (AIHW, 2003). Practitioners were split fairly evenly between the public (53.1%) and private (46.9%) sector with over half (55.4%) employed in teaching hospitals. The majority of respondents (56.6%) were employed in metropolitan locations with 14.9% in rural and remote locations.

Computers with Internet access within the workplace
The vast majority of respondents (96.2%) reported some level of computers with Internet access within their workplace (Figure 1). Over half of respondents reported Internet access was available on all or most workplace computers whilst nearly one-quarter reported Internet access was restricted to computers within offices only.
Ease of access to the Internet within workplaces

Figure 2 shows MIWs rating for ease of access to the Internet within their workplace. Forty-six percent of MIWs rated their ease of access to the Internet in their workplace as very easy. Ten percent of MIWs rated their ease of access as not easy and a further 11% (thirty-five MIWs) reported they had no access to the Internet within their workplace. The majority of MIWs who reported no access to the Internet within their workplace were from the private health sector (57%); non-metropolitan (54%) locations (regional 34% and rural and remote 20%); non-teaching work environments (79%) and their area of specialisation was Radiography (66%). Eighty-two percent of MIWs who reported no access to the Internet within their workplace did have one or more computers with Internet access available.

The written comments on questionnaires identify that heavy work pressures and workplace culture were contributing to the individual MIW experiencing no access to the Internet within their workplace despite computers with Internet access being available. Lack of time due to heavy workloads was identified by
many MIWs as preventing them accessing the Internet in their workplace. Comments included ‘The access exists, the time to access is very limited (work – load dependent)’, ‘[my workplace] doesn’t encourage it [Internet access]. My work is I feel about examining as many patients as possible. Numbers are important– productivity’, ‘very little time available during work hours – too busy’ and ‘time at work is limited – always busy; in the workplace some dedicated time for computer access [is needed]’. High workloads prevent practitioners from accessing information they need to provide the highest quality care. As one practitioner pointed out when dealing with non-routine cases:

Would be nice to have more time to access references to know what is going on when things don’t go according to plan

MIWs identified that whilst computers with Internet access were available within the workplace, use of the Internet was denied or restricted within the workplace. Some MIWs were denied access to the Internet at all times in their workplace, whilst others could use the Internet after they had completed their work shift. Comments included ‘all staff denied Internet access’, ‘not allowed to use Internet’ and ‘able to use Internet access after hours’. Other MIWs identified that Internet access was restricted to selected websites, for example ‘no access to Internet other than approved sites even these sites are limited’ and ‘only if recognised site – do not have access to web only govt site’. Access to the Internet was also restricted to selected staff within the workplace. Comments included ‘personally no issues but rest … need someone to sign in for them to access net’, ‘Internet access only given to Senior Practitioners’, ‘majority of staff have to gain access to Internet via managers’ and ‘all computers have Internet access but 2/100 staff have access’. Access to professionally relevant information in the workplace, as one MIW responded:

Depends on the support of the management in the workplace. If they support Internet access / database of journal then I can access the Internet & journals online and can get relevant information most conveniently

Relationship between Computers with Internet access and MIWs’ ease of access to the Internet

Table 1 shows the relationship between computers with Internet access within the workplace and MIWs ease of access to the Internet. It can be seen from Table 1 that in workplaces where all computers have Internet access, the vast majority of MIWs (77%) describe their access to the Internet within their workplace as very easy. In contrast, where computers with Internet access are restricted to offices only, over half of MIWs described their access to the Internet as either not easy (20%) or as having no access (35%). In the MIW workplace, offices are typically restricted to Managers and some senior staff. Non-senior MIWs typically work in an assigned modality area, which may or may not have computers with Internet access. Difference in ease of access to the Internet was statistically significant for role of MIW (Fisher’s exact test = 29.797, p ≤ 0.01) with 29% of non-senior MIWs (n=149) describing their ease of access to the Internet as not easy (12.8%) or no access (16.1%) compared to 17% of Senior MIWs (n=83) and 13% of Managers (n=56). One manager indicated that:

[electronic information] resources are used mainly by people who are looking up areas that they’re unfamiliar with so it could be a new technique or some new name– or it could be an old name of say a view within the X-ray – or what they should be seeing as a result, where that experience and expertise is not available

Unfamiliarity and lack of experience and expertise is more likely to exist in recent graduate practitioners. Ninety-one percent of MIWs with less than 5 years clinical experience were employed in a non-senior role. In workplaces where all computers have Internet access 65% of non-senior practitioners rated their ease of access as very easy. In contrast, in workplaces where Internet access was restricted to offices only, 43% of non-senior practitioners reported they had no access and a further 19% described their access as not easy, the lowest scale on the 5-point likert scale. Restricting Internet access to offices only, particularly
disadvantages the recent graduate practitioner, a group that should be actively supported in developing their knowledge, skills and expertise.

Table 1: Medical Imaging Workers’ rating of ease of access to the Internet against computers with Internet access within their workplace (n=309)

<table>
<thead>
<tr>
<th>Ease of access to Internet</th>
<th>very easy (1)</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>not easy (5)</th>
<th>no access</th>
</tr>
</thead>
<tbody>
<tr>
<td>All computers (n=124)</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Most computers (n=48)</td>
<td>77</td>
<td>6</td>
<td>12</td>
<td>3</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Some computers (n=58)</td>
<td>52</td>
<td>13</td>
<td>23</td>
<td>9</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Only computers in offices</td>
<td>19</td>
<td>19</td>
<td>31</td>
<td>13</td>
<td>19</td>
<td>3</td>
</tr>
<tr>
<td>(n=68)</td>
<td>13</td>
<td>4</td>
<td>13</td>
<td>0</td>
<td>20</td>
<td>35</td>
</tr>
<tr>
<td>No computers (n=11)</td>
<td>9</td>
<td>9</td>
<td>27</td>
<td>0</td>
<td>0</td>
<td>55</td>
</tr>
</tbody>
</table>

Influence of access to the Internet and use of Internet tools and resources

Cross tabulations were performed to determine if computers with Internet access in a workplace was associated with frequency of use of email, Internet search engines and web sites by MIWs. The results are shown in Table 2. It can be seen that a higher percentage of MIWs use Internet-based tools and resources on a daily or weekly basis when all computers within the department have Internet access.

Table 2: Influence of Computers with Internet access within a workplace against frequency of use of Internet-based tools and resources by MIWs

<table>
<thead>
<tr>
<th>Use of email (n=314)</th>
<th>Fisher’s exact test</th>
<th>P value</th>
<th>Difference in experience of MIWs</th>
</tr>
</thead>
<tbody>
<tr>
<td>56.251</td>
<td>p ≤ 0.001</td>
<td>58% of MIWs use email daily when all computers within the workplace have Internet access compared to 17% of MIWs when Internet access restricted to Offices only.</td>
<td></td>
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</table>

| Undertake Internet searches (n=308) | Fisher’s exact test | P value | 57% of MIWs undertake Internet searches daily when all computers within the workplace have Internet access compared to 12% of MIWs when Internet access restricted to Offices only. |

| Use of web sites (n=309) | Fisher’s exact test | P value | 52% of MIWs use web sites several times per week when all computers within the workplace have Internet access compared to 15% of MIWs when Internet access restricted to Offices only. |

Cross tabulations were performed to determine if ease of access to the Internet in a workplace was associated with frequency of use of email, Internet search engines and web sites by MIWs. The results are shown in Table 3. It can be seen that a higher percentage of MIWs use Internet-based tools and resources on a daily or weekly basis when they describe their access to the Internet within their workplace as very easy.
Table 3: Influence of ease of access to the Internet within a workplace against frequency of use of Internet-based tools and resources by MIWs

<table>
<thead>
<tr>
<th></th>
<th>Fisher’s exact test</th>
<th>P value</th>
<th>Difference in experience of MIWs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of email (n=313)</td>
<td>72.644</td>
<td>p ≤ 0.001</td>
<td>61% of MIWs who rated their access to the Internet within their workplace as very easy were daily users of email compared to 10% of MIWs who rated their access to the Internet within their workplace as not easy</td>
</tr>
<tr>
<td>Undertake Internet searches (n=307)</td>
<td>100.789</td>
<td>p ≤ 0.001</td>
<td>46% of MIWs who rated their access to the Internet within their workplace as very easy undertook Internet searches daily compared to 13% of MIWs who rated their access to the Internet within their workplace as not easy</td>
</tr>
<tr>
<td>Use of web sites (n=308)</td>
<td>52.844</td>
<td>p ≤ 0.001</td>
<td>33% of MIWs who rated their access to the Internet within their workplace as very easy use web sites several times per week compared to 7% of MIWs who rated their access to the Internet within their workplace as not easy</td>
</tr>
</tbody>
</table>

Discussion

This study has explored health practitioners’ accessibility to the Internet within their workplace by using two indicators, namely computers with Internet access and practitioners’ rating of ease of access to the Internet within their workplace. In this study it has been shown that there is widespread variation in computers with Internet access within Medical Imaging workplaces. The vast majority of MIWs (96%) had some level of Internet access with over half of respondents reporting Internet access on all or most computers within their workplace.

Perception of ease of access to the Internet was overall quite positive amongst MIWs with almost half of respondents reporting they have very easy access to the Internet within their workplace. The vast majority (77%) of MIWs with Internet access on all workplace computers rated their ease of access to the Internet as very easy demonstrating a strong connection between the universal inclusion of Internet access onto workplace computers and MIWs ease of access to the Internet.

This research has also shown that frequency of use of internet-based resources and tools to meet professional learning needs was positively associated with increased ease of access to the Internet and increased numbers of computers with Internet access within the workplace. This finding indicates that workplaces can proactively support practitioner engagement in professional learning by increasing the accessibility of the Internet to practitioners within their workplace. This is best achieved through the universal inclusion of Internet access onto all workplace computers.

Whilst this study has not examined specific information sources, the finding that frequency of use of Internet-based resources was positively associated with increased ease of access to the Internet and increased numbers of computers with Internet access within the workplace may be of interest to the many health professions where practitioners are being urged to increase their use of evidence-based information sources available through the Internet (McClusky, 2003; Metcalfe et al., 2001; Nail-Chiwetalu & Ratner, 2006; Newman, Papadopoulos & Sigsworth, 1998; Veness, 2001).

It was also apparent from this study that not all MIWs are afforded with easy access to the Internet within their workplace. Eleven percent of MIWs indicated they have no access to the Internet within their workplace and a further 10% rated their ease of access, as not easy, the lowest point on the 5-point likert
scale. This demonstrates that for many MIWs the Internet is not readily accessible in their workplace, despite 96% of MIWs reporting their workplace did have one or more computers with Internet access. The implication is that a large proportion of MIW’s (21%) will not be able to harness the benefits of the Internet to access current health and medical information to support their professional practice and provide the best possible healthcare.

Workplace culture and heavy work pressures contribute significantly to lack of access to the Internet for professional purposes. For example, in Herrington and Herrington’s (2006) survey of professional use of the Internet, teachers nominated access problems such as a lack of time to go online (e.g., ‘having the time to sift the good information from the rubbish’, ‘access and time are the factors – it’s another add on to another crammed and busy daily schedule’). In spite of the fact that nearly all schools have Internet access, limited accessibility was still a problem (e.g., ‘we have one computer for seven teachers in our staffroom - it has to be rebooted twice a day’, ‘server fails regularly’, ‘the network is always broken at our school’).

One teacher pointed out:

Time on the Internet is extremely limited while at work, as there are other professionals needing to use the same computer; I usually end up not researching my topic, therefore producing a standard of work below my own expectations. (p.75)

In the same study, some professionals were limited by their employers to sites only available on an intranet, with no access to outside websites. Others were denied access to the Internet at all times at their workplace, and any professional development on the Internet was done in their own time at home. For example, many nurses have restricted access to the Internet at work. As one nurse responded:

Internet usage at work for our nursing staff is restricted to senior staff, so most nurses cannot access it. There is only one computer for the nurses in the staff development department for them to use the Internet. It would be great, and make the job of staff development easier, if everyone (doctors and nurses) were treated equally - with respect, and these nurses given access too. It may seem there is the belief they might just ‘sit in front of the computer’ and not do their work. The opposite in fact is so – they barely have time to have a tea break. (p. 34)

Practical difficulties of accessibility also limited professionals’ use of the Internet, such as the need to share computers or obtain special permissions. For example, in Herrington and Herrington’s (2006) study, one occupational therapist pointed out:

I would probably use the Internet a lot more at work if I had access to all sites. My line manager must put a password in the computer for me if I want to use sites like OT seeker, or a search engine. She is usually hard to get hold of so I often don’t use the Internet for this reason. (p. 41)

Similar to other professions, MIW’s operate under heavy work pressures and this research shows that for many MIW’s workplace culture contributes to their lack of access to the Internet for professional purposes. Multiple factors were identified which contributed to this lack of access and these included lack of computers with Internet access, the use of passwords to deny or restrict access to the Internet, and some workplaces limited access to an intranet with no access to external websites. These forms of restriction on access to the Internet are similar to those identified by Herrington and Herrington (2006) and are in accord with other recent studies of access to the Internet by health practitioners in Australia (Klotz and Reis, 2005; Shaw et al., 2006).

Almost one-quarter of MIWs reported that in their workplace Internet access was restricted to computers in offices only. This research has identified that when this practice of restricting Internet access to offices only occurs, the greatest negative impact is on the non-senior practitioner with 62% describing their access
to the Internet as not easy (19%) or no access (43%). It was also shown that the vast majority (91%) of recent graduates (less than 5 years clinical experience) were in these non-senior roles and so restricting Internet access to offices only, particularly disadvantages this group at a time when they are intensively developing their knowledge, skills and expertise. This finding that restricting internet access to offices only, disadvantages recent graduates in particular is likely to be of interest to other professions such as nursing and physical therapy, where similar to MIWs, the majority of non-senior practitioners work within assigned treatment or patient care areas and so do not have their own or a shared office.

MIW’s identified that they wanted and needed greater workplace support for accessing information to meet their professional learning needs. Their comments included ‘more Internet access at work and time to use it’, ‘I need more time at work to access info – not just scanning patients’ and ‘I think workplaces should provide [Internet] access even if used in personal time for professional development’. Practitioners who do not perceive that their workplace supports their professional learning may, as this MIW wrote, ultimately leave the profession.

“My employer has previously not been particularly supportive of continuing education, thus my interest moving to areas of work that have a more supportive and progressive attitude to their staff. There has recently been a takeover in management and this is improving, however I have since moved in other directions [into a different profession]. Too little, too late!”

Conclusion

This research provides a dataset of health practitioners’ accessibility to the Internet using two common indicators, namely computers with Internet access within the workplace and practitioners’ ease of access to the Internet within the workplace. This study has shown that frequency of use of internet –based resources and tools to meet professional learning needs was positively associated with increased ease of access to the Internet and increased numbers of computers with Internet access within the workplace. This study has shown that there is a strong connection between the universal inclusion of Internet access onto workplace computers and MIWs ease of access to the Internet. It was also evident that practitioners’ ease of access to the Internet is negatively impacted by heavy workloads and a workplace culture that imposes additional Internet access restrictions such as restricting Internet access to computers in offices only or using passwords to limit access to selected practitioner roles within the workplace. This research has identified that such practices have the greatest negative impact on non-senior practitioners, the majority of whom are recent graduates. The design of modern workplaces needs to account for location and the access to computers but more importantly the mindset of employers needs to change to recognize that all professionals need web access to information and communication tools in order to benefit their own professional learning and the clientele they serve.

References


