

General Practitioners and Online Continuing Professional Education: Projected Understandings

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ABSTRACT

Continuing professional education seems to be particularly suited to the online environment with opportunities to communicate anywhere anytime. This appears to be convenient and time efficient for the busy working professional. The views of practising professionals were sought and form the basis of this paper. Primary care physicians at two locations, who actively pursue continuing education, discuss the role of information technology in their daily professional practice and give their views about online education. This professional group is a good example of how a particular interaction style is significant to the collective cultural mores of a group. The paper concludes that these group preferences need to be taken into account when designing continuing education and some suggestions are made for design.

Keywords

Online education, Continuing professional education, Continuing medical education, Web-based education, General practitioners, Primary care medicine

Introduction

The use of information and communication technologies in learning has grown rapidly (Conole, Hall and Smith, 2002). Online or web-based education has been used in a variety of contexts and across the different stages of education, including professional development (Brink, Munro and Osborne, 2002; DeLacey and Leonard, 2002; Lockwood, 2001; Mason, 1998). Web-based education offers flexible access and communication where the potential to form personal and professional networks electronically is significant. Networked continuing professional education (CPE) is argued to have many advantages (Bernath and Rubin, 2001; Kirkpatrick and McLaughlan, 2000), including those of access and flexibility, which would appear to be especially useful to busy, working professionals (Conole et al., 2002). With CPE available anytime, and almost anywhere, web-based learning for professional development has much to offer continuing self-directed professional education. However, web-based CPE is a comparatively recent development (Anderson and Kanuka, 1997; Brosnan and Burgess, 2003; Friedman et al., 2002; Peterson, 1999) and can be described as an innovative product (Lally, 2002). This paper will consider the views of potential users of a particular type of web-based CPE, physicians in general practice in Australia.

Web-Based Education as Innovation and Continuing Medical Education

The underlying principle that informs this paper is that taking the culture of the target group into account will go a long way towards overcoming any potential reluctance to adopt technology, as well as encouraging engagement with technology. Innovative products must be “positioned in the marketplace in ways that match the understandings and expectations of customers” (Lally, 2002: 119). These customer understandings are based on what consumers already know, and novel products rely on consumers being able to speculate and project ideas about the nature of the new experience. In line with this, online education evaluators have established that participant perceptions in CPE are an important part of adoption (Anderson and Kanuka, 1997). The uptake of technology is a complex matter and human responses often appear paradoxical (Mick and Fournier, 1998). It has been proposed that to “ignore, refuse and delay adoption of technology are arguably quite judicious choices” (Mick and Fournier, 1998: 141) and that this can protect the unwary consumer from expensive and time-consuming mistakes. Therefore, while attitudes towards technology can change over time (Lee et al., 2002), the issues surrounding the human interface with IT need to be given close consideration if novel advances are to be widely adopted. In particular, it makes good sense to take into account the specific needs of the targeted users and to investigate related understandings and expectations.

Part of the context for the targeted users in this instance includes a specific type of work organisation. IT in any workplace is complex but in the context of general medical practice arguably some of the paradoxes of technology are more visible. Firstly there is the issue of the reliability of novel technology, particularly in primary care practices where the kinds of support given in larger organisations is expensive and not available as easily, nor as quickly. Then there is the time-consuming nature of learning new software, which can be a serious deterrent to a self-employed professional. While Internet and IT compliment rather than displace other activities, they are also malleable and changing fast (DiMaggio et al., 2001). These rapid changes place demands on small enterprises and therefore this is an area that requires ongoing and context specific research.

A further aspect of understanding that needs to be included here is the professional’s need to learn in, and for, a specific context (Eraut, 1994) and the different learning needs that arise as their expertise develops (Daley, 1999). Conceptualisations of professional competence recognise the significance of continuing education, or lifelong learning, as an integral part of the complexity of professional knowledge (Eraut, 1994). Indeed maintaining a zest for learning was argued to be one of the defining features of professional work (Houle, 1980), with continual learning that goes beyond simple up-dating a crucial element in professional competence (Cervero, 1988). Continuing medical education (CME) has a long history (600 years) but it is a relatively recent development to have this available on the Internet (Peterson, 1999). A recent assessment of CME online found 205 host computers, 80 of which were American medical schools and 55 of which were commercial sites (Peterson, 1999: 243). These figures suggest that the Internet is becoming a significant, and recent source of CME.

If web-based CME is taken to be an innovation, then Lally's (2002) suggestion is that investigating potential users’ experience of related activities and asking them to speculate about the novel product could enhance understandings about potential participants’ expectations. Moreover, although the positive position for online education is well supported in the literature from several different standpoints, these tend to be written from the perspective of the developer, the teaching institution or the evaluator. It is also important to take the user's perspective into account. So, what is the view of practising professionals, who make regular and consistent use of continuing education? How do they perceive web-based education? A good understanding of the target group supports a user-centred approach to design (Lee et al., 2002; Spector and Wang, 2002) where varying views of users can be informative (Clulow and Brace-Govan, 2003). It was suggested that targeting online education to the needs and attitudes of specific user groups enhances, at least initially, the likelihood of uptake and encourages a positive perspective. The overarching suggestion here is, that it is beneficial to actively work with particular groups to create the continuing education that they need for their context (Daley, 2000:40), not only in terms of content, but also in terms of engagement and interaction preferences.

With regards to the question raised, general medical practitioners, or primary care physicians (GPs), are in quite a particular and interesting position. As a professional group they have a history of using professional development and in Australia (like Canada) they receive accreditation points for continuing medical education (Cervero, 2000). At the same time, they are required to deal with the rapid changes in medical knowledge and implement these in a practical, face to face context with their patients. In a review article that defines and assesses what professional competence might mean to the medical profession, Epstein and Hundert include the self-directed acquisition of new knowledge, being able to recognise gaps in their own knowledge and using appropriate resources as important factors in the continuing professional education of competent doctors

(2002:227). Professional work has been noted as undergoing change in recent times (Wilson, 2000). Some argue that GPs have maintained more autonomy than might be indicated by suggestions of either de-professionalisation or proletarianisation of the professions (Lewis, Marjoribanks and Pirotta, 2003). Others suggest that managerial and professional work are converging in an elite strata of neo-entrepreneurialism (Leicht and Fennel, 2001). What these discussions underscore is the widely recognised need for professionals, including GPs, to undertake continuing education to maintain currency, competency and competitiveness (Curry and Wergin, 1993; Harris, 1993; Leicht and Fennel, 2001; Lewis et al., 2003; Mott and Daley, 2000). But, would online delivery of CME for GPs address their needs effectively and efficiently? A first step would be to find out how GPs perceive information technology (IT) and its place in their professional practice. This may draw attention to any issues that might need to be considered when introducing online CME.

There are quite divergent views on the usefulness of information technology to general practice. Some claim that there is "little evidence that computers are of any value for healthcare in general, especially general practice" (Bolton et al., 1999: 962) while others suggest that information technologies play an "enabling role" and describe doctors as knowledge workers (Wickranasinghe and Lamb, 2002). A review of studies of computers in primary care locations found that overall general practitioners were positive about information technology but had five reservations (Mitchell and Sullivan, 2001). GPs expressed concerns about the cost of computerisation, the time it took to master the processes, the lack of adequate training, the impact that engaging with a computer might have on their interactions with patients and, the potential loss of confidentiality in record keeping (Mitchell and Sullivan, 2001:281).

Reports commissioned to investigate general practice and IT in Australia suggest that IT has much to offer GPs in terms of streamlining data management and supporting patient management (GPCG, 2001; Richards et al., 1999). Although IT uptake amongst Australian GPs has been described as slow (GPCG, 2001:6; Richards et al., 1999:4), or "in its relative infancy" (Health Online, 2001:6), nonetheless others argue that government incentives to make use of IT in the day to day management of patients and practices have had an impact (Western et al., 2001: 4). A recent national representative survey reported computerisation of general practice at around 90%, and therefore widespread. It also noted that practices with over three doctors were, not only considered to be large, but they were also more likely to be computerised (Western et al., 2001:43). GPs did not report feeling anxious about computer use or learning computer skills, including doctors who were older (Western et al., 2001: 101). However, GPs found learning new software time-consuming (Western et al., 2001: 102; Mitchell and Sullivan, 2001:281) and, remained wary about the amount interference that computers introduce to their relationship with the patient (Western et al., 2001:101; Mitchell and Sullivan, 2001) seeing writing as less invasive than typing (ACNeilson, 1998:34).

This paper reports on an exploration of how IT was used and perceived by GPs with a view to understanding how IT could be used in CME. Two medical practices with access to IT and an active approach to CME were invited to explore some issues with the author. These investigations at the local general medical practice level show that continuing professional education, construed by the GPs as CME, and online delivery are not quite as straight forward as the literature suggests.

Method

While there is some work on GPs attitudes to IT, this particular area of IT involvement with CME is under-researched, so an exploratory, qualitative approach was adopted (Patton, 1990; Strauss and Corbin, 1998). Two metropolitan general medical practices met the research criteria, were approached and agreed to take part in the study.

<i>Research Criterion</i>	<i>Justification for Criterion</i>
1. Practice with more than three doctors	Larger practices more likely to be computerised
2. Metropolitan practices	Improves access to wider range of CME
3. Access to IT at work	Good IT connections enhances usability
4. Similar location and patient access	Focus comparison on research issues

The first research criterion was that the practice should have more than three doctors because larger practices were noted as more likely to be computerised. Secondly, using metropolitan practices meant that the doctors all had reasonable access to CME of various kinds, which is not always the case for rural practitioners. At the time of the interviews, general practitioners were required to gather a certain number of CME points every three years, or triennium, in order to practice. CME points could be gathered from a wide variety of CME activities

but a focus on city-based doctors enhanced the likelihood of personal preferences being available as an option. A third element the research required was that the practices had good access to IT. This was the case here and both practices provided each GP with a computer and had cable network installed. Fourthly, the practices also needed some other structural similarities in terms of geographic location and patient access to narrow the focus of the comparisons. They were both located in suburban Melbourne, in well kept, converted residential properties, conveniently located on major roads with access to parking in nearby side streets or public transport. They were both open five and a half days a week and later field observations noted that both practices were busy. With more than three GPs in each practice, these practices were above average size for Australia (Richards et al., 1999). Most Australian general practices (60%) have only one or two doctors, 26% have three to five doctors and only 14% have six or more GPs (Western et al., 2001:29). However, 43% of practices in capital cities would have three to eight doctors (Western et al., 2001:31). In addition, 96% of practices with three or more doctors use computers (Western et al., 2001:31). Therefore, these two practices would be considered large by Australian standards, but not unusual for a city location and typical in that they are computerised. It was assumed that the number of doctors also gave rise to a need to communicate with each other about practice management and patient care. One significant point of difference between the two practices was maintained. Some general practices bill the government directly through a national health scheme and the patients are charged nothing directly. Other practices charge fees and the patient must seek a partial rebate through the health insurance scheme. Practice A charged fees for consultations and GPs usually saw around four patients an hour. This practice also had more GPs who worked part-time. Practice B relied mostly on bulk billing through the national health insurance scheme (Medicare) and GPs took around six consultations an hour.

The principle data gathering instrument was the semi-structured interview schedule, which allowed the GP participants to explore the concepts of CME and IT both separately and together from within the context of their own medical practice. As well as the discussions with the GPs in the practice, observations about the practice were noted in a field diary and documents used to communicate with patients were also entered as data. These sources were used to corroborate information given by the interviewees. Furthermore, one participant from each practice was interviewed about the practical aspects of IT such as available hardware, installed software, Internet connections and IT support. In one practice this was a GP and in the other practice this was the Practice Manager. In all, 10 participants were interviewed: nine GPs (five from practice A and four from practice B) and one practice manager. A doctor that was a director of the practice, as well as a doctor that was a partner in the practice, were interviewed in both locations. The remaining five doctors were employed by their respective practices. There were two GPs in each practice who did not consent to be interviewed. The participants were ages 30 and older, with half of them in their 30s. Two participants were men, and eight were women. Three doctors worked full time and six doctors worked part time. In this paper individuals will be quoted using a number system for reasons of confidentiality.

One further source of information was utilised by the study. The Australian Government's Department of Health and Aged Care through the General Practice Computing Group had developed resources to support general practitioners on issues surrounding IT and general practice. A web site of case studies was available on the Internet (IM in GP Lead Practices, 2002). In all, six case studies described the experiences of exemplar, lead practices and acted as "peer education models" (IM in GP Lead Practices, 2002: 1). The lead practices used included a mix of metropolitan and rural practices and varying numbers of doctors with four cases have more than three doctors. The one constant factor across the cases was a computer on every doctor's desk with access to email and Internet. This kind of benchmarked, or exemplary performance is used to good effect in medical education (Mazamanian and Davis, 2002: 1058). In this instance, the descriptions present a positive perspective on the adoption and utilisation of IT. However, with this bias in mind, comparisons between the research interview data from this exploratory study and the descriptions from the lead practice web site were useful for further verification and context. It is noteworthy that the experiences described cover patient and practice management but do not include web-based CME.

The research question was divided into three separate sections. Firstly, the doctors were asked to describe the CME activities that they had attended in the previous twelve months. Secondly they described the extent to which they incorporated IT into their daily work practices and how they felt about IT. Finally the participants were asked to address the main question, how do you think you would feel about taking a web-based CME activity and what issues would you consider relevant to that speculation? The paper will build a description following the same progression. The GPs' engagement with CME and use of IT will be described, followed by an analysis of the GPs' perception of using IT to access CME. The paper will close with the implications the analysis has for the implementation of CME online.

CME Activities

These GPs were busy professionals with full appointment books who were concerned to maintain the currency of their own professional knowledge in order to best serve their patients and ensured that they conveyed relevant professional knowledge to the others in their practice. There was a range of CME available to them and all the doctors were actively engaged in some kind of continuing education on a regular basis, as can be seen from table 1.

CME Activities Attended in 12 months	No. GPs*
Lecture Series at Local Hospital	5
Conference at Hospital	2
Short Course	1
Alternative Medicine Course	1
Formal Journal Reading Group	5
Regular Discussion Group	4
Drug Co. Sponsored Lectures	1

* Some doctors attended more than one type of CME

Table 1. CME Activities Attended by GPs in Previous 12 months

The most popular option regularly attended by five GPs was a series of weekly lectures arranged by the local hospital on varying topics. The presentations were usually made by specialists from within the hospital. A further two GPs reported recent attendance at a conference at the central Children's Hospital on paediatrics and one other doctor was taking a short course on counseling skills. All of these activities counted as CME points for their ongoing accreditation as general practitioners, although they also all explained that they were well past the minimum points for a triennium. The remaining GP was attending a course on an alternative medicine and could not gather CME points through this educational activity. However, this doctor gathered the points needed for accreditation through journal reading and attending a journal club, or discussion group, which met regularly at the practice. Although both practices held regular meetings to exchange information about patients and administration, one practice had a more formalised approach. In this journal club the GPs made presentations to pass on knowledge from their other CME activities, or invited a speaker to present to them on a specific topic. Another option for education which accumulated CME points were lectures sponsored by the drug companies which the GPs were prepared to attend but they were more wary of the information presented here than the other options they used regularly.

In short, all these GPs were actively, and regularly, engaged in CME and, although this is a requirement for their accreditation, their engagement with this was more a question of being a good quality professional practitioner. As this GP said:

I'd like to maintain a certain level of practice and I think you've got to continue with education too.
[doctor 3: p13]

A view given in more detail by this GP:

From my point of view, I've been doing it a long time, and it's nice to just get your thoughts re-ordered, get them into perspective, Next time you see that problem you deal with it much quicker, and more confidently because you know what you are going to do next.
[doctor 7: p7]

In addition, although the format varied between the two practices, there was some sharing of information about patients, practice management and the content of continuing education. Overall the GPs were active in their pursuit of their own self-directed learning and made clear links between CME and professional competence. The next step was to ascertain how they perceived IT in their day to day practice and to make some assessment of this. It was noted earlier that the Lead Practice web site described achievements of six case study practices. These descriptions will be taken to be benchmarks, as the site suggests. A comparison between the practices in this study and the exemplars on the Lead Practice web site gives an indication of the extent to which IT is used and the extent to which it could be used.

IT Use and Attitudes

All the GPs used IT in the course of their everyday practice, although some used IT with more enthusiasm than others. A policy decision had been taken in both practices that IT would be made available to all the GPs, but neither practice would do more than encourage GPs to make use of the system. In each practice one person was described as being the in situ 'expert'. In one practice it was the Practice Manager and in the other it was the Practice Director. Both were particularly positive about the usefulness of IT in managing the practice in terms of appointments, staff rosters, billing and banking and both practices used IT for practice management and patient management. The use of IT in patient consultations and patient histories was a matter for individual GPs. All the GPs used IT for prescriptions, pathology requests and reports, and letters to specialists. The software that both practices used also automatically indicated when drugs were incompatible and gave patient summaries.

This had some resonance with the Lead Practice Case Studies provided on the Australian Division of General Practice web site (IM in GP Lead Practices, 2002). At this site six cases are presented as exemplars in the use of IT in general practices. Comparing the Lead Practice Cases with the practices from this study, IT was reported as being used for similar purposes: pathology, patient databases, rosters, billing, appointments and other practice management tasks. Generally the GPs in this study recognised the functionality of IT echoing many of the comments at the Lead Practice web site. For example printed scripts increased readability for pharmacists (doctors' writing being widely perceived to be illegible). IT was also useful in the case of multiple medications or allergies by giving automated warnings. In the practice that relied on Medicare bulk billing, the electronic summaries were noted by all these GPs as quicker and easier to "flick through" than written patient histories. However, neither practice was prepared to go to paperless, or rely entirely on electronic record keeping and this was an important point of difference with the web site examples. In the Lead Practice Cases there was positive reporting about using electronic patient records. In the practices in this project, the GPs were reluctant and resistant to the idea of only having electronic records. There were three issues here: reliability, accuracy and confidentiality.

In the first instance it was the reliability, of the technology, or rather the lack of it. A GP described the effect:

We've had a couple of instances when the computer's gone down here and it's just thrown the whole surgery, the whole practice, into chaos.
[doctor 5: p3]

And at the other practice a GP said:

I just don't trust IT enough to go to a full paperless office.
[doctor 7: p2]

Apart from the impact that was felt when the system was not operational, not only was it difficult to work when the computer system was not functioning, but there was also a potential to lose important patient information. This then raised the issue of accuracy in record keeping, not only for appropriate patient care, but also for professional responsibilities to other agencies that might require, or rely on, accurate patient histories, for example in insurance claims. The accuracy here related to maintaining full and complete records of patient visits. The concept of accuracy was further extended by one GP to include their need to use drawings in their notes in order to fully record details of a case [doctor 8: p4], which was not possible in the medical software available. In addition there were also deep concerns for the confidentiality of records. They worried about the implications for patient privacy in electronic record keeping. These concerns ranged across what would be on screen and visible to the patient, the impact of concentrating on typing rather than on the patient, and who would have access to the patient's information. Concerns that were also noted by Mitchell and Sullivan (2001). The reluctance to maintain electronic patient records had the further effect of viewing IT as a source of "doubling up" on record keeping. The GPs' perception was that to overcome the lack of system reliability, to maintain accuracy and to address the need for patient confidentiality, they would have to maintain two sets of records, one paper based and one electronic. This contrasts with the efficiencies of IT promised on the Lead Practice web site.

Although all the GPs used IT for managing information about the practice and their patients, only one GP from each practice could be described as fully in favour of IT (see table 2).

GPs' attitudes towards IT use in General Practice	No. GPs
Very positive	2
Neither positive nor negative	4
Somewhat negative	2
Very negative	1
Total	9

Table 2. Summary of GPs' Attitudes Towards IT Use in General Practice

The remaining seven GPs had varied reactions: two GPs in each practice were equivocal about IT (it was OK but it had limitations); one GP in each practice was not particularly happy about using IT; leaving one GP who described themselves as "a bit anti-computer" and thought that generally the community would be happier without computers [doctor 6: p5].

Individual attitudes to the computer were further revealed through the GPs' use of the Internet to obtain supporting information for their professional practice. Although attitudes varied about the potential usefulness of the Internet, only two of the GPs would actually use the Internet to find information for themselves on a regular basis [doctor 7, doctor 9] and another GP noted the helpfulness of visual material from the Internet in understanding some medical conditions [doctor 2: p11]. The remaining six doctors would direct patients to useful and reliable sites if they knew of one giving the kind of information they would support. Overall though, the GPs were troubled by the inaccuracies of medical information on the Internet and were concerned about the effect that this could have on patients, potentially causing unnecessary anxiety. This more ambivalent attitude towards IT was an important point of difference to the reported cases on the Lead Practice where such doubts were not expressed. In this study, even those GPs who were kindly disposed towards IT were concerned about the patients' ability to assess medical information. Furthermore, in their discussions about the Internet and patients two key, linked issues emerged. Firstly the GPs expressed the need for reliability of medical information but a sense of unreliability with Internet sourced information. Secondly though, reliability is often established through the reputation of the information provider. The link between the reliability of information and the reputation of the provider of information becomes even more important in the provision of CME.

Perceptions of web-based CME

Considering the GPs attitude towards IT in their general practice (see table 2), it is unsurprising that these doctors were not especially in favour of using IT for their CME. However, the position was not simply a negative perspective on computers. GPs used their continuing education for more than ensuring good quality professional practice and their complex motivations had a bearing on their perspective on using IT for CME. It has been recognised for some time now that lectures organised by local hospitals for general practitioners not only offer advice and information, but that they are also a useful mechanism to encourage GPs to refer their patients to the hospital's specialists (Cervero, 2000; Daley, 2000). However this works both ways, because for the GPs these lectures offered them the opportunity to evaluate the specialist doctors available and assess for themselves the quality and depth of the specialists' expertise, as well as their suitability for the GPs' patients. Several of the GPs [doctors 2, 4, 5, 8, and 9] specifically stated that their choice of lectures depended on the reputation of the speaker. This professional network relied on trust and face to face interaction with implications for the GPs own patients. The referral process was an important reflection of the GPs themselves, as this GP explained:

I think you can judge a lot from when you meet somebody, what sort of person they are and how you think the patients might interact with them, because I think the patients, from the referral point of view, the patients – it reflects on me, how a patient finds the particular doctor they end up seeing.
[doctor 3: p15]

The judgement described by this GP was a significant area of professional skill for general practitioners. One GP [doctor 10: p5] used the term "artistry" to convey the extent to which practical medical knowledge was used interpretively when consulting with a patient. Through their professional practice and the ongoing experience of being a GP, doctors were immersed in the day to day experience of knowing, of creating understandings for themselves and others through the face to face interaction that was the bedrock of their general practice. Eraut (1994) asserts that professional knowledge needs to be characterised through the context in which it is used. In the context of general practice, GPs' skills relied on the extensive use of face to face interactions. It was the mode of communication that characterised their professional activity, as compared to a radiologist or a surgeon

for example. Therefore, for GPs to feel the need to establish someone's professional reputation through face to face interaction and to maintain their professional network in this manner was to be expected. This interaction process gave them the opportunity to assess specialists for referrals in a manner in which the GPs felt accomplished. It also meant that additional related topics could be touched on and in this way diversity with relevance was accessed in a succinct and time effective manner. One of the GPs who was in favour of IT, and used IT quite extensively for information gathering, said this:

Online you are probably going to look up a specific product – not a product, maybe a specific problem. Whereas you might look up a kidney problem but with the last talk at {the local hospital} we probably covered 30 kidney problems. {there's} question and answer, and you can interrupt them during the talk [doctor 7: p8]

Asked about conducting this kind of educational or information and networking activity online, the response was that this would be too much reading, and too time-consuming. The GPs described a strong perception that computers were only for reading and not especially different to journals. Furthermore the process of typing responses, as compared to talking, was also described as time-consuming. Face to face interaction with other people was seen not only as time efficient, but it was the additional ingredient offered by lectures and perceived (however erroneously) to be missing from IT facilitated interactions. The GPs expressed a need for interaction in the education process:

But for education it's really important to actually have interaction. So, it [online education] is really just another reading mechanism. [doctor 5: p5]

It [online education] would be akin to reading the dictionary to me. [doctor 4: p15]

I read journal articles every night and I go to sleep. if you're just reading it and it's not being presented in an interesting way, it's all the same. [doctor 2: p4]

Another GP [doctor 9: p6] who was also active in gathering information from online resources also preferred to go to presentations but the reasoning here focussed not only on accurately grasping information but also, importantly, the reputation of the source. The reputation, the trustworthiness and accuracy of the information, and the need to understand the perspective of the source was a concern for the doctors. The doctors preferred method of establishing reliability and reputation was through face-to-face interaction and talking.

One last issue connected with reputation that needs consideration is the link between software and advertising by drug companies. Unsolicited advertising was an integral part of the patient management software that the practices used. For one GP this advertising further undermined the computer as a reputable source of information. The link here relied on views about drug companies. The lectures that the companies provided (usually with lunch or dinner) which earned GPs CME accreditation points, were widely seen as presenting information that was potentially useful but usually slanted in the drug companies' favour. It was information that needed to be dealt with circumspectly because the information provider could not be seen to be fully impartial and objective. When this GP was asked about online education the association between software and unsolicited drug advertising was made immediately. It was this GP's perception that medical practice software was simply an easy avenue through which drug companies could sell their products. This perception distorted the GP's view of online education and, although an extreme view, it does express the reservations that many GPs feel about drug companies and biased information. A similar point was raised by Peterson (1999) around the quality of commercial provision of CME on the Internet. Peterson questions the impact of any underlying market interests and the potential for imbalance in provision due to specific sponsor needs (1999:247). The doctor's comment in this study about advertising in software reinforces the point that GPs put a high value on the interpersonal, professional network on which they relied for quality information. The question that arises now is what do these collected attitudes imply for online CME?

Discussion

Although selected purposefully to explore the issues of CME and IT with GPs who had good access to both, the limitations of this study due to the small sample size are acknowledged. Therefore, it is not possible to generalise from the results and further research is required. However, the motivations and perceptions of learners are crucial (Brink et al., 2002; Clulow and Brace-Govan, 2003), particularly in regard to their views on technology (Lee et al., 2002), so some implications can be derived from this research. The literature showed a wide range of views on IT in general practice (Bolton et al., 1999; Wickranasinghe and Lamb, 2002) and the GPs in this study

also expressed such diversity. Principally the concerns identified by Mitchell and Sullivan (2001) regarding costs, time management, lack of training, impact on patient relationship and potential loss of confidentiality for patient records were also expressed here. IT was perceived by the GPs in this study as a functional, useful tool for practice and patient management but they were reluctant to rely solely on IT and to surrender their paper records. In addition, as suggested by Epstein and Hundert (2002), the GPs in this study actively and critically pursued self-directed learning. However, the GPs perceived online, or web-based, CME as lacking interaction and no different to their journal reading. Furthermore, reading was seen as more time-consuming and less informative than attending presentations given by experts. It was suggested that face to face interaction was a key skill for their profession and integral to the process of establishing the credence of other professionals. It was a network of trust, a community of practice that was built using the face to face evaluation of people through the use of the GPs' well-tuned skills of gauging individuals on the basis of their self-presentation and interaction. In short, CME was a time efficient means to gather not only needed information but also a means to extend and verify a professional network, but computers were tools like books and journals not for interactive communication.

This begs the question, how then can GPs be persuaded to view online CME positively? What kinds of issues need to be considered when designing web-based continuing education for this particular professional group? Perhaps the questions raised by Cervero (2000) on CPE in general need to be paraphrased for online CME and addressed first. Why is CME going online? Who will benefit from this? Who will provide the online content? Drug companies, Universities, professional associations or collaborations? These issues need to be addressed and communicated to the wider GP community. Currently, much of the advice about online delivery of education relies on self-directed learning being part of a large organisation's strategy for staff development and there is little research focusing on small enterprises (Brink et al., 2002). Most general practices would be classified as very small enterprises with below twenty staff. Furthermore, GPs, like many other professionals in small professional service firms, take responsibility for their continuing education individually (Mazmanian and Davis, 2002). Therefore, as a first step the advantages of asynchronous flexibility needs to be more widely promoted to individual GPs, along with the benefits of developing an electronic professional network to extend the boundaries of trustworthy and informative colleagues.

It was also clear from the results reported here that the reputation and relevance of any online presenter is important. So a second step would include establishing the presenter's credentials. In the instance of the GPs, perhaps this is the time to clarify any role or input from drug companies. In addition, there was an expressed need to interact with that expert presenter (Mazmanian and Davis, 2002). One potentially useful model would be the Virtual Seminar in Distance Education where professional development was team taught to specific geographic locations (Bernath and Rubin, 2000). A key element of this model was the inclusion of a highly regarded expert for each of the four areas of theory covered. The expert was available as a source of information and motivation. As a third step, topics need to be focused on the specific needs of identifiable general practitioners and dealt with in a succinct and informative manner. An option here would be the negotiated group learning described by McConnell (2000) where participants took an active role in deciding the direction of their co-operative small group work. A further option would be to combine both these suggestions taking care to keep time-consuming reading and typing to a minimum. Another design approach that integrated online and face to face classes was used successfully at Harvard (DeLacey and Leonard, 2002). Here expert presenters took face to face classes and then learners worked on a joint project online. This kind of interaction has been shown to be valuable in medical education (Mazmanian and Davis, 2002: 1058). In addition, a crucial element of success in the Harvard project was the care taken to fully inform and prepare these learners for the online environment. A point that has been made for courses delivered entirely online with no co-presence at all (Brace-Govan et al., 2001; Clulow and Brace-Govan, 2003). However, co-present communication has been noted as essential for other professional groups in project work and management (Bjorkegren and Rapp, 1999; DeLacey and Leonard, 2002) and it was clearly important for the professional group studied here. The preferences groups have for particular kinds of interaction can be usefully incorporated into the overall management of CME online.

Conclusion

The study relied on the assumption that consumer perceptions of innovative products derives in part from related activities. A further assumption was that understanding these perceptions can usefully inform ways to tailor innovative products so that they are more appealing in the first instance. The relevant related activities were the GPs' recent CME and the ways in which they used IT in their medical practice. From this point the GPs were invited to speculate on how they perceived web-based CME and, in general, their perceptions were quite

negative. It was suggested that this could be overcome by suitable tailoring of web-based education which would need to take into account the GPs' need for reliability of information and their desire for face to face networking.

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