

Computer Based Training: An initial study to discover why doctors trained as Disability Analysts have been reluctant to fully embrace this mode of training

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Contextualisation

This paper reports a study looking at computer-based training in the field of post-graduate medical education. The paper examines the apparent reluctance of a group of medical practitioners to fully engage with post-graduate medical training produced on a CD-ROM; the study seeks the reasons for this lack of engagement. The, perhaps, rather unexpected reasons for this will be of interest to many general educationalists both inside and outside the field of medical education.

Abstract: *Medical practitioners working as Disability Analysts were offered computer based training (CBT) as part of their ongoing Continuing Professional Development (CPD). The majority of the Disability Analysts approached in this study showed some reluctance to embrace this learning approach. This reluctance was characterised as 'surprising' by the developers. Consequently, it was felt important to determine the nature of this reluctance, so that appropriate CPD could be developed, and the effort involved in devising such training, better channelled. This paper describes these doctors and their work, the need for CPD and the type of CPD used. It also discusses the introduction of CBT, doctors' responses to it and the ways in which educationalists and developers responded to doctors' comments. This initial study used a semi-structured interview technique to gather the response data. The study also identifies important political and ethical issues underlying the research. It emerged that doctors choosing paper-based training had positive reasons for doing so. Indeed, some doctors choosing the computer-based training were not entirely positive about that mode of delivery.*

This study arose in the context of the author's professional work as a medical training developer. This involved providing training for 200 medical practitioners, as full-time employees, and another 2000 doctors who worked on a part-time basis. These doctors were specialists in Disability Analysis; they carried out wide ranging assessments of people with various medical conditions looking at the functional aspects of those conditions and the resulting capability of the person concerned. Part of the work involved the development and production of Distance Learning and Trainer-Led materials for these medical practitioners.

In addition to specific initial training, all doctors working as Disability Analysts are required to undertake Continuing Medical Education (CME) as part of their Continuing Professional Development (CPD). The CPD offered to these doctors was a mixture of distance learning (paper-based) material and trainer-led classroom sessions. Doctors working as Disability Analysts need to undertake on-going training as part of the process that revalidates their continuing profession registration. There is therefore a clear need for CPD.

There is no single correct, or best way, of carrying out continuing professional development; the methods that would be chosen by particular doctors will depend on their personal preference and its perceived appropriateness. Indeed, the educational theory of learning styles (Honey and Mumford, 1992) predicts that matching a learning style with a particular learning preference will enhance learning. Certainly, the use of educational material should embody the use of teaching styles that match participants learning styles, rather than any

preferred style of the teacher (Lesmes-Anel, Robinson and Moody, 2001), and thus the materials provided.

With the educational theory about learning styles in mind, it was felt that Computer Based Training would be welcomed by doctors as part of this diversity. The company for which the author worked was also of the opinion that CBT would be desirable; it would be easier to handle, cleaner, modern, more interactive than paper-based material, allow indexing, help cross-referencing, and there would be helpful links to other parts of the material. The CBT was initially offered in the hope that it would ultimately replace the paper-based training to some extent, its interactive abilities offering greater flexibility.

The company started to use CBT with a series of evidence based medicine (EBM) protocols, about musculoskeletal disorders, which had been extensively researched and were all evidence based. The protocols themselves were extremely detailed. It was felt that paper versions of these would be dull, textbook like, and would not be popular. In response, the company produced a video of the evidence based clinical musculoskeletal examination, but did not want to distribute the video alone, without instruction and covering material; the whole package would have been somewhat unwieldy. It was therefore produced as a CD-ROM (working with CBT developers). The CD-ROM included illustrations, a video, and Multiple Choice Questions (MCQs), which were added to the protocols. However, interaction was limited to watching the video, as an M-PEG, on the computer screen, and completing the MCQ tests, with feedback given to the formative questions. The presentation of all the protocols as pages of text on screen, led to a product that has been described as being similar to reading a textbook on the screen. This experience, advice from others, and feedback from other CBT producers all suggested that CBT was best suited to interactively presenting the key learning points from the protocols. Moreover, the protocol content could be made available on the CD-ROM, as reference material, and links within the CBT would give easy access to appropriate parts of the protocols.

It had been anticipated that the use of interactive material would be welcomed by users of the materials, because of the diversity of learning styles it supported, its opportunities for interaction, and the somewhat overwhelming volume of paper-based material. There is some evidence that interactive educational methods in continuing medical education are more effective in changing doctors' performance (Smits, Verbeek and de Buissonje, 2002). It is also apparent that different learning methods tend to suit different doctors and different, identified, learning needs (Grant, 2002).

As a result, further EBM protocols in different fields have been developed. This has involved learning to present interactive pages on CD-ROM, with protocols available as linked reference material. A paper-based equivalent of this material has also been developed, for those who requested this format.

The Research Question

These localised observations and problems were considered, alongside more general and professional discourses and debates, and formed the initial stage towards a research question (Brown and Dowling, 1998). The specific question emerging for this study was:

'Why are doctors, trained as Disability Analysts, reluctant to embrace Computer Based Training?'

The aim of the study was to investigate the choices, and the underlying reasons for those choices, made by Disability Analysts when deciding about their own CPD. The objectives were to identify the choices, identify the doctors making these choices, collect the data, and use this data to answer the specific question.

I chose to answer this question using a qualitative approach and decided that the methodology would involve articulating reasons, reflections, and reports; the method would initially be by interview.

Rationale for research

When the initial CBT was ready to be issued, the company thought that their doctors would want CBT, so we asked for responses only if the doctors actually wanted paper versions. Those doctors that did not reply, ie, 'Nil replies', were all sent CBT. However as discussed above, we require MCQs to be returned as proof that the material has been received, studied, and assimilated. We noted that we had received very few completed MCQs back and so made enquiries; as a result, the company decided to send paper versions to all those who had not returned an MCQ.

Of the total doctor workforce of about 2200 only about 400 requested paper-based-resources. Therefore 1800 doctors were sent CBT. However, only 400 from this group completed MCQs. So 1400 (1800 minus 400) doctors were then sent a paper version in addition to the previously distributed CBT. The end result was that only about 400 doctors out of 2200 used CBT sufficiently to complete the MCQ. The company was concerned that this figure was so low. There were also important business costs involved; we had developed expensive interactive CBT, but then had to issue a bulky expensive paper version in addition.

Design, Research Methods, and Analytical Methods

From this previous work, we realised that doctors might not want CBT, so this year we asked for responses indicating if doctors wanted CBT or paper versions. On this occasion, the 'Nil replies' were all contacted to see which mode they required.

I had hoped to consider the population requesting CBT, or paper, at initial response separately from those making the requests after a reminder was received. However, unfortunately, separate figures were not kept, and so only the total figures of those requesting paper or CBT were available. In this year, about 800 doctors chose CBT, with about 1400 doctors choosing paper; even with those choosing CBT, about 200 doctors then asked for a paper version to use either instead of, or in addition to, the CBT.

In order to investigate further, why some doctors were choosing paper-based material in favour of CBT, I needed to find out from that group of doctors the reasons behind their choice of paper-based training. I was also interested to know why the group choosing CBT had made that choice; I wanted to know what led them to that decision. This study required interviews, because I did not know the range of possible answers. The interview had to be somewhat unstructured allowing the doctors to give their true feelings and reasons for the particular choice. I had no clear ideas at this stage why doctors were reluctant to choose CBT.

The interviews were semi-structured. I made sure that certain topics, themes and questions were covered by the inclusion of these questions (Burgess, 1984) in the interview sheets (Appendices 1 and 2). This approach allowed people's views and feelings to emerge but allowed the interviewer some control of the interview direction (a focused interview). The interview concentrated on subjective experience. Interviewer skill was required, in particular, with the use of probing questions (Robson, 2002, p 276); this was required especially with a question such as 'what do you like and dislike about the preferred paper, and what do you like and dislike about the CBT version?'. This crucial question had to be answered in full, and each strand of the question had to be given a considered response. The interviewer could not allow a non-committal shrug of the shoulders or a 'I don't know' response. The interviewer needed skill to make effective use of the probing question technique.

This was a qualitative study, focusing on individuals. In this initial study, we interviewed small numbers and explored the reluctance to embrace CBT in these interviews. The interviews with participants were kept broad, letting participants tell their stories (Morse, 1998); the answers given were the important 'detail' and not the quantification of the answers.

The interviewer recorded information as fully and unambiguously as possible. Most notes were recorded during the event, but these notes were reviewed soon after the interview to fill in necessary details and to make sure that they were understandable. It was not appropriate to type directly onto a laptop during the interview as this would have been distracting for both parties (Robson, 2002, p 290). It had been planned to record the interviews, but the tape recorder was felt to be intrusive and threatening by the first three participants, and so was not used. The possible reasons for the avoidance of tape-recording are mentioned below.

Before the interviews, I needed to consider how to recruit the participants and where to carry out the interviews. It was felt best to look for neutral territory, and certainly to avoid the interviewer's office. Because of the time constraints and small numbers in this initial pilot, people were actually interviewed in their own office setting, when the interviewer was at that particular site.

Given the care taken with the choice of territory and office, it was of particular concern that some participants wanted to avoid tape-recording of the interview. Following the study, informal discussions with some of the participants revealed that some doctors had expected to be criticised for not using CBT, which they saw as the company's preferred option. They had not wanted any criticism to be tape-recorded; some doctors had discussed this before the interviews, and these doctors had decided, as a group, that they would not be tape-recorded at interview. Having conducted the interviews, the responses to the interviews were analysed, and these responses were listed.

Ethical and political issues

Ethical issues were considered from the very beginning of this study. The actual subject of CBT could have been considered unethical if an adverse situation was going to be exacerbated by carrying out the research: for example, insisting that doctors use CBT in future if there were no good reason found for choosing paper. Problems could have continued in the study with the choice of venue for interviews. A neutral venue was sought and the need to be away from the exclusive domain of the interviewer was recognised. However, time constraints meant that participants' offices were actually used.

Consideration was given to the right of all individuals not to take part. There might be thought to be penalties for non-participation, such as not being invited to participate in computer based projects in the future. Other perceived penalties might have been less overt, perhaps involving the future attitudes of senior staff towards them (covert penalties). Also, asking people in advance about participation in the study, and discussing its content might alter the behaviour of interest and make the findings biased (Robson, 2002, p 67).

However, in reality, there appears to be little that can be done about these issues; in this study it was thought that the refusal to be tape-recorded involved discussion by the participant as a group before the interviews. Involving people without consent, coercing them into participation, withholding information about the true nature of the study are all unethical, or at least of questionable practice, and were not even considered. Similarly, invasion of privacy, exposure to stress, and not treating the participants with respect are questionable practices (Robson, 2002, p 69), and were avoided as far as possible. It was accepted that there would have to be some invasion of privacy and possible, increased, stress. Interviews are intrusive and can be distressing for participants if they are asked to confront aspects of their work, or their lives, that they find uncomfortable (Bush, 2002). The lines between

coercion and collaboration, imposition and negotiation, are often blurred by the pursuit of just and fair practices (Clay, 2001). Practitioners needed to know what exactly was happening, and to be protected from any adverse comments made by them or by the reporting in general.

There were, in addition, political issues that related to the role of CBT in the company. Considerable time and resources had been invested in this CBT work, which was seen by the company as appropriate, and the way forward. If the study was to find that CBT would not be entertained by an overwhelming majority of Disability Analysts, then the study findings might not be welcomed by the company. The doctors might therefore be unwilling to admit to certain attitudes or behaviour (Foddy, 1993).

For the practitioner conducting this research, the insider / outsider relationship posed a significant ethical dilemma. Participants might see themselves as part of the company or see themselves as totally independent practitioners. The interviewer might well be seen as a spy for the company, might be considered to be responsible for getting things done properly, and indeed might be thought to be seeking perceived 'correct' answers in this study.

Results

In the study 10 doctors were interviewed: five choosing CBT and five choosing the paper version. The first three interviewees declined to have their interviews audio-taped; there was a definite air of suspicion and mistrust. Therefore, none of the interviews were audio-taped and written records were kept for all instead.

The 5 doctors *choosing paper* were labelled as respondents A, B, C, D, and E. They participated in semi-structured interviews with key questions asked during the interview (see Appendix 1). A number of important points emerged. All people requesting the paper-based version offered clear reasons for doing so. Respondent A said that it was easy to refer to, and easier to look up the MCQ answers in the text of a book. Respondent B said that she could read it anywhere – for example on the train to work, or at work. Respondent B also said that she remembered parts by remembering the page layout. Respondent C said he wanted to be able to highlight parts for reference. Respondent D said that he preferred paper-based learning; it was what he had always done. D also said that he liked to flick back and forward through the topics. Respondent E said that she had not seen the CBT and was not sure what it would be like, so she had requested paper; she had subsequently seen the CBT and liked the look of it. None of these respondents mentioned dislike of the paper-based version, even with prompting.

Most people requesting the paper-based version, had views about the CBT version. Respondent A said that she could not reliably get on a computer, and that previous CBT had not worked on her computer. Similarly respondent B said that she did not use the computer at home. Respondent D said that he did not really like computers. E said that she had been reluctant to change, but now liked the look of it. There were no other comments about liking the CBT, even with prompting.

Similarly, the five doctors *choosing CBT* were labelled respondents 1, 2, 3, 4, and 5. They also had a semi-structured interview with key questions asked during the interview (see Appendix 2). Again certain points emerged. When asked what they liked about the preferred CBT version, Respondents 1 and 3 both said it was exciting; other comments were that it was interactive, easy to use, state of the art, and up-to-date. The interactive quizzes were an appeal to two of the respondents. However, dislikes were also mentioned. Respondent 2 said that reading off a screen was tiring for his eyes; Respondent 3 said that much of the reading material was for reference and that it might be useful to have this on paper. However Respondent 3 then added that the interaction on the CBT could not be replicated adequately on paper. This group gave dislikes for the paper version as being like a textbook, and being dull.

Each of the respondents was asked certain questions. All were asked for their general views on CBT. Perhaps, as could have been predicted, the respondents choosing paper-based training were not enthusiastic about CBT, but those choosing CBT were very positive. Similarly, they were asked what would make them select the alternative version. Each participant had negative views about having to choose the alternative version.

The doctors were asked whether they had access to a computer at the office; this group of 10 doctors replied that each member had very limited or no access to a computer at work. Similarly, the doctors were asked whether they had a computer at home; this group replied that each had a home computer.

Of the five doctors choosing paper-based training (summarised in Table 1 below), four were aged 50-59 and one was 40-49. Similarly, of the five doctors choosing CBT, again four were aged 50-59 and one was 40-49. In the group of doctors choosing paper-based training, three had qualified in the UK and two had qualified in Asia. Two of the five doctors choosing CBT qualified in the UK, and three qualified in Asia. Of the five doctors choosing paper-based training, two were male and three were female; the five choosing CBT were three male and two female doctors.

Table 1. Biographical data from all participating doctors

Participants choice	Sex		Age group (years)		Place of qualification	
	Female	Male	40-49	50-59	UK	Asia
Paper-based	3	2	1	4	3	2
CBT	2	3	1	4	2	3

Discussion

People choosing the paper-based training, appeared to have more positive reasons for doing so. Ease of reference (especially for the completion of the final compulsory MCQ), ability to read anywhere, and visualisation of the material on paper as a memory aid, were all important considerations. The interactivity of the CBT was its main positive point. However, even those choosing CBT expressed concerns about finding screen reading tiring to the eyes, and felt that paper material might be better for reference.

In this very small study, there were no clear sex preferences regarding the choice of CBT or paper-based training. Similarly there were no clear age preferences, and the area of qualification was not clearly related to choice of training material.

However, there are important lessons to be learnt from this small study. CBT is clearly not just going to be eagerly accepted, when there is an alternative, and there are positive reasons for continuing to provide paper-based training. It certainly appears that there are reasons not to stop the production of paper-based training. Educationally, this fits with a variety of learning styles and the need for a variety of teaching methods.

Although this small study was carried out in a medical context, the reasons and preferences are arguably generalizable to other contexts and fields of research. Similar findings might be expected in studies in other fields.

Dissemination and possible uses

It might be thought to be inappropriate to disseminate the results of a small initial pilot, but there are important findings about the participants' reluctance to fully embrace CBT making it appropriate to disseminate the findings to a wider audience. CBT is a growing industry in the whole of medicine and in education generally, so the problems, and the findings, are likely to have some generalised usefulness.

Conclusion

It has been demonstrated, albeit with a small sample, that doctors working as Disability Analysts appear to be reluctant to embrace CBT, despite their need for CPD. A specific research question of 'Why are doctors working as Disability Analysts reluctant to embrace Computer Based Training?' was developed, and an initial study was carried out. The question was answered in a qualitative way using a semi-structured interview technique to explore attitudes towards CPD and CBT and also reasons for the poor uptake of CBT usage.

All people requesting the paper-based version had clear reasons for doing so. The reasons given included: that it was easier to refer to, and that it could be easily read anywhere. Other positive reasons were to do with learning styles such as remembering the page layout and highlighting parts for reference. However, there were also elements of inertia, commenting that paper-based training was preferred because that was what the doctors were used to it. Some of these doctors requesting the paper-based version had negative views about computers, saying they did not like computers or did not use computers at home.

The doctors choosing CBT were positive about their choice, saying it was exciting; interactive, easy to use, state of the art, and up-to-date. However these doctors also made negative comments about the CBT; it was mentioned that reading off a screen was tiring for his eyes, and that the reference material might be useful on paper.

From this limited study, paper-based training is certainly seen as having advantages by some doctors, though others value the added benefit of CBT. Although this study was carried out in a medical field, the reasons and preferences appear to be generalizable elsewhere. Similar findings would be expected in studies in other fields. It is hoped that the findings will be of interest to a wider medical audience. In addition, the findings are also likely to have importance in several broader educational fields.

References

Brown, A. and Dowling, P. (1998) *Doing Research / Reading Research*. London: Falmer Press.

Burgess, R. G. (1984) *In the Field: An Introduction to Field Research*. London: Routledge.

Busher, H. (2002) Ethics of Research in Education, in M. Coleman and A. R. J. Briggs (eds) *Research Methods in Educational Leadership and Management*. London: Paul Chapman Publishing.

Clay, W. C. (2001) Coming to know my Place, in J. Zeni (ed) *Ethical Issues in Practitioner Research*. Columbia: Columbia University, Teachers College.

Foddy, W. (1993) *Constructing Questions for Interviews and Questionnaires*. Cambridge: Cambridge University Press.

Grant, J. (2002) Learning needs assessment: assessing the need. *British Medical Journal*, 324, 156-159.

Honey, P. and Mumford, A. (1992) *The manual of learning styles*. Maidenhead, Berkshire: Peter Honey.

Lesmes-Anel, J., Robinson, G., and Moody, S. (2001) Learning preferences and learning styles: a study of Wessex General Practice Registrars. *British Journal of General Practice*, 51, 559-564.

Morse, J. M. (1998) Designing Funded Qualitative Research, in N. K. Denzin and Y. S. Lincoln (eds) *Strategies of Qualitative Inquiry*. London: Sage.

Robson, C. (2002) *Real World Research*. Oxford: Blackwell.

Smits, P. B. A., Verbeek, J. H. A. M. and de Buissonje, C. (2002) Problem based learning in continuing medical education: a review of controlled evaluation studies. *British Medical Journal*, 324, 153-156.

Appendix 1

Form for semi-structured interview for doctors requesting CBT

Unique reference:

First confirm if they asked for CBT

Ask doctors

What do you like and dislike about the preferred CBT, and what do you like and dislike about the paper version?

Ask

What are your general views on CBT?

Ask

Do you have a computer at your office?

Ask

Do you have a computer at home?

Ask

What would make you select the paper version?

Ask

Which age band are you in?

- <30
- 30 – 39
- 40 – 49
- 50 – 59
- 60 – 69
- 70+

Ask

Where did you originally qualify in medicine?

- UK
- Europe
- Africa
- Asia
- Australasia
- North America
- South America

Mark sex

- male
- female

Appendix 2

Form for semi-structured interview for doctors requesting paper version

Unique reference:

First confirm if they asked for paper

Ask doctors

What do you like and dislike about the preferred paper, and what do you like and dislike about the CBT version?

Ask

What are your general views on CBT?

Ask

Do you have a computer at your office?

Ask

Do you have a computer at home?

Ask

What would make you select the CBT version?

Ask

Which age band are you in?

- <30
- 30 – 39
- 40 – 49
- 50 – 59
- 60 – 69
- 70+

Ask

Where did you originally qualify in medicine?

- UK
- Europe
- Africa
- Asia
- Australasia
- North America
- South America

Mark sex

- male
- female