

## Pharmacy student perceptions of educational media tools

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### Abstract

User perception is an important consideration when assessing the educational value of multimedia resources. A media tool may be proven educationally, but if the users (normally the students) perceive it as anything less than helpful, they are unlikely to obtain maximum utility from it. The aim of this study is to assess the *perceived* educational value of multimedia tools currently available to MPharm students (i.e. DVD, CD-ROM, handouts/practical schedules and internet resources, including streaming video media) and the factors that influenced students' perception. MPharm students from all four cohorts of the Brighton MPharm degree pathway participated in this study. Respondents identified handouts and schedules for workshops and laboratory classes as the most useful resource, followed by internet-based resources and DVD/CD-ROM resources. Printed resources were perceived as more reliable and trustworthy compared to multimedia resources. DVD-based resources were perceived to captivate attention and maintain focus more than other resources and respondents favoured a combination of printed and electronic resources to be available. Generally, although electronic resources (particularly those which are internet-based) were positively perceived, the use of printed media, such as laboratory schedules and lecture notes, was preferred in conjunction with multimedia resources.

**Keywords:** *Educational media tools, multimedia, pharmacy, pharmacy education, pharmacy students, MPharm*

### Introduction

An educational media tool is any form of media, including internet-based resources or audio-visual media, that is used to enhance the overall student learning performance. Usually, these tools are not intended to replace standard lectures, but to complement and supplement; to provide additional learning support to compliment more traditional modes of delivery. Learning which is assisted by the use of educational media tools has been demonstrated to be beneficial to student performance (Jonassen, 2000; Diercks-O'Brien & Sharratt, 2002).

Traditional educational resources, including handouts and laboratory schedules and workbooks, have been discussed in detail elsewhere (Ingram et al., 2004). A wide range of educational media tools and flexible modes of delivery, are currently available to educators and in turn, students. These include DVD and CD-ROM formats, which can be effectively

incorporated into traditional lectures or laboratory classes, handouts for lectures and workshops, practical schedules and resources available via the internet, including streamed audio–video files or centralised web-based interfaces. In general, these resources offer high levels of flexibility and interactivity which enhances learning, often by providing prompt feedback and allowing students to work in a way and at a speed, which is highly tailored to the individual and which may dissipate issues of resource intensity and teaching efficiency (Heinich, Molenda, Russel, & Smaldino, 2002; Cunningham, Harris, Kerr, & McEune, 2003).

The use of multimedia technology within the framework of tutorial sessions may not be the prime mode of delivery but it is an increasingly popular, resource-friendly and efficient method of supporting teaching activities that are traditionally resource-intensive. The tutorial resembles traditional modes

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of learning wherein the tutor or lecturer is in control of, or actively facilitates, the learning process. In such a setting, multimedia technologies can normally be used in three ways; to simply provide information, to interactively demonstrate a theory or an idea, or they may require active participation of students (Means et al., 2001). Previously, Hamer (2000) described the influence of multiple experimental techniques on learning. It was found that student learning increased when multiple experiential techniques were employed in relation to learning based on a single technique combined with delivery of a lecture. Further, data suggested that the use of multiple experiential techniques influenced the nature of the information absorbed by students.

Strauss and Frost (1999) investigated the nine key factors that influenced the selection of instructional technology tools. They presented two conceptual guides to facilitate the selection of appropriate technology for marketing classes, focusing on cognitive and skill-based learning objectives and demonstrating the strengths of employing a range of resources to assist teaching and learning. Davis, Shekhar, and Van Auken (2000) examined the effect of pedagogical preferences on attitudes towards the major educational resources available. They found that effective attitudinal enhancements of key pedagogies were apparent and associated such in-class activities to a level of overall student attitude to the degree programme. Clarke, Flaherty, and Mottner (2001) investigated student perceptions of educational technology tools and explored the ability of such tools to improve teaching delivery and learning, the students' ability in the job market and expected job performance. While the overall findings of the study varied, the authors summarised the generalised students' view of educational media tools (Figure 1).

The present study investigated students' attitudes and habits toward the use of handouts in the MPharm degree and indicated that staff and students' opinions on the use of handouts varied greatly, with students preferring the provision of more comprehensive printed resources. Langley, Marriot, and Belcher (2004) assessed the attitudes of students on the use of technology in pharmacy education. They found that

students rapidly embraced technology in the MPharm course but only viewed its role as supporting and not replacing, traditional teaching methods—a view mirrored by academic staff, although issues of uptake and training remained. In general, while these studies are comprehensive, they focus either on traditional or multimedia technologies, and often examine only a single type of media resource.

Davis et al. (2000) commented that the provision of the students' ideal multimedia educational resources enhances learning and personal transferable skills and that the optimisation of such resources may have significant financial implications. Therefore, the aim of this study was to investigate student perceptions and attitudes to traditional and multimedia educational tools and the factors that influence these choices.

## Methods

All students in Levels 1–4 of the University of Brighton MPharm degree pathway were asked to participate in this study by completing a questionnaire. A response rate of greater than 67% was achieved. The questionnaire commenced with the collection of biographical information (age, gender, level of study, marital status, number of children, first language and previous degree) and was followed by brief definitions and uses of each educational media tool. Two parts followed this section: Part A and Part B. Part A included a ranking (1 = the highest ranking and 4 = the lowest ranking) to assess student preference of the four educational media tools under investigation (DVD, CD-ROM, internet and handouts/practical schedules) and an open-ended question for students to justify the rankings made. Part B consisted of 12 statements relating to factors influencing students' choice of highest ranking, general perceptions of educational media tools and use upon availability. A 5-point Likert-type scale was used (1 = strongly agree, 5 = strongly disagree) to assess students' perceptions. Data obtained from the questionnaires were analysed using SPSS<sup>®</sup> V12.0. Cronbach's  $\alpha$  was used to examine internal consistency.

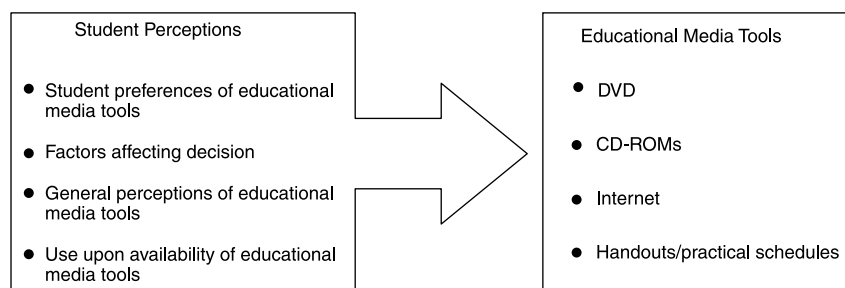


Figure 1. Conceptual model of student perceptions on educational media tools (adapted from Clarke et al., 2001).

A random sample of MPharm students from the University of Brighton was invited to participate in a series of four focus groups. The aim was to discuss why handouts had the highest ranking, clarify indecisive responses from the questionnaire and determine the ideal educational media resource.

## Results

293 out of 317 pharmacy students completed the questionnaires, a response rate of 92%. 245 (77%) forms were completed correctly and used in this study. Fischer's exact statistical test was used to analyse links between demographic data and the highest ranking (i.e. the most preferred) media tool. In all cases, the Fischer's exact test did not reach significance at  $p < 0.05$  level. Students generally preferred handouts (Table I). Of those students who chose handouts as their preferred choice, 92.3% either strongly agreed or agreed that they were more "reliable and trustworthy". The majority (87.5%) of students favoured the use of DVD-based media if made available prior to lectures. Irrespective of the specific ranking of the media tools assessed, 63.7% of students "strongly agreed" that educational media tools, irrespective of type, should be made available for every part of the pharmacy degree course. The extent to which the course should be supported by such resources was less easily defined, with 50.2% of students in favour of very comprehensive support and 21% undecided, although it was strongly felt that the use of extra resource did not replace extra support and interaction with academic staff (i.e. in workshops and tutorials), nor did the availability of such resources make students academically "lazy". The responses to the open-ended questions provided in this section were not specific and had no consistent responses.

Across all four levels of the MPharm pathway, issues of connectivity and transportability of electronic resources were an important issue for students and may prevent its wider uptake. Such issues contributed to the students' desire to have a resource that was readily available, hence the confusion with requests for both printed and electronic resource provision.

Students were happy to use the types of resources investigated in this study, particularly if they were made available prior to lectures, in order to enhance the more traditional form of course delivery. A large

Table I. Percentage of highest ranked choice.

Type of educational media tool	Percentage of students ranking this tool 1st (%)
Handout	58.5
Internet	27
DVD	10.25
CDROM	4.25

number of students (26.2%) disagreed that there was no need for educational media tools. These responses imply that students perceived multimedia educational resources as essential to their learning.

In Levels 3 and 4, students' responses to two particular statements were positively correlated with each other (Spearman's  $\rho > 0.500$ ,  $n = 245$ ), suggesting that students whose highest ranking educational media tool could captivate attention and maintain focus also felt that it could enhance interest in learning. Respondents were also asked why they had ranked the four media types as they had. Tables II–V illustrate some of the reasons given.

Randomly invited participants ( $n = 6, 6, 5$  and  $4$  per group, total 21) took part in focus group sessions. Handouts were perceived as most popular due to their ease of use, convenience and flexibility. All participants agreed that not all students were familiar with multimedia technology and that learning how to use the resource, as well as having the appropriate hardware (both on campus and at home and the resultant expense of either) were substantial issues. The majority of students agreed that multimedia resources should include comprehensive course notes, and that students would prefer to have at their disposal a combination of different multimedia resources.

## Discussion

Respondents clearly indicated handouts as the educational media tool of interest. This is most likely due to their flexibility, mobility, availability and IT/cost issues. Clarke et al. (2001) suggested that familiarity influences such choices and that the majority of students make such choices based on

Table II. Level 1, qualitative responses to respondents' reasons for ranking the educational media tool they are most likely to use to enhance their learning performance.

Handouts	Handouts are something that I am used to, beneficial if given out before the lecture so you can make additional notes also a guide as to what to study.
	Make extra notes during lectures instead of having to write them all down ( $\times 4$ )
	Listen to the lecturer instead of having to write
	Most convenient
	Handouts are the norm ( $\times 3$ )
	Available at any time
	Prefer hard copies (repeated in variation $\times 8$ )
	Easy to access and clear
	Handouts are available any where
	Reliable and do not have to worry about the technology
	Ease of use ( $\times 6$ )
Internet	I have internet at home
	Student central very useful to organise work
DVD	More interactive

Table III. Level 2, qualitative responses to respondents' reasons for ranking the educational media tool they are most likely to use to enhance their learning performance.

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Handouts
Most practical
Read handout before hand
Convenient
Useful before lectures
Easy and used to using
Previous experience
Information is to hand
Cannot always access, computers and dvds
Direct interpretation of the subject
Put personal notes on the handout
Convenient and availability
Straightforward
Internet can be unreliable
I like my notes in front of me
Internet
If available via internet do not need to attend lectures
Good if I have missed a lecture
Visual aids improve concentration
Visual aids improve understanding
Convenient
DVD's and notes can be lost
Can have an idea of what the subject is about before lectures
DVD
Bored of handout
More interactive
Good as most people have DVD players
Cal and DVDs can be helpful
Take DVD's home and watch if lectures missed
CD
All important
CD ROM learning packages reinforce learning
Interactive

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previous inculcations or past experience. Handouts are easy to annotate during lectures. Cost may be another factor, as the handouts are currently provided free of charge, whereas students have to pay for other media. For example, the provision of lecture notes and other learning resources in an electronic-only format ensures that students will incur the costs associated with printing and may thus be deterred from such practices despite the other attractions of these media. From the educator's point of view, handouts are no easier or more complicated to modify than electronic media, as most printed resources are prepared via computers. This finding is in direct contrast to the current perception that electronic-based media provide an enhanced learning environment. Clearly, this study indicates that while students also readily use such resources, their preference is for the more traditional resource of handouts. Further, despite all the advantages of handouts they can be prohibitively expensive, or it may be physically impossible to add visual aids and videos to the available learning resources in a way that can increase mode of learning and maintain student attention.

Table IV. Level 3, qualitative responses to respondents' reasons for ranking the educational media tool they are most likely to use to enhance their learning performance.

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Handouts
Too expensive to print off student central
Easy to annotate
Most lecturers do it ( × 3)
Established media tool
Hand out very specific
Used in class
Better than internet due to connection problems
Easy to follow in lectures
May not have internet/DVD player ( × 8)
Convenient ( × 5)
More accessible
Can read handouts any time
DVD is too new ( × 4)
Easier to learn when in front of me
Can be annotated
Poor with new technology ( × 3)
Start your learning process
Internet
Good if you miss lectures
Download in your own time
Do the work when I want to
Access anywhere
If lectures are missed can still download
Saves on photocopying
Makes it easier
Good access
Most interaction
DVD
Easy to remember after watching a DVD
Ease of use
Most interesting ( × 4)
Visual aids are more appealing

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Table V. Level 4, qualitative responses to respondents' reasons for ranking the educational media tool they are most likely to use to enhance their learning performance.

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Handouts
Others to new
Take anywhere (sic)
Ease of access
Ease of use
Prefer hard copy
Helpful when revising
Like to have hard copies to ad to my notes
Everything you need to know
More familiar
Other ones not user friendly
DVD's could be too long and therefore not watch
What I am used to
More use to handouts
Like to have them to then make my own notes
Previous experience
Convenient
Do not like CAL packages
Internet
Most useful
Good to be able to download
Varied web sights
DVD
Easy to understand something you see ( × 3)
Internet connection at UNI is slow

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In contrast to the findings of the questionnaire, focus groups indicated that a combination of handouts and electronic media would provide the most appropriate learning resource. This perhaps reflects the ranking of electronic media in the questionnaire and provides a more realistic assessment of student needs than a simple “first passed the post” interpretation of the questionnaire. Students felt that a combination of the most suitable resources allows flexibility and enhancement of the learning experience and provides an opportunity to indirectly become comfortable with important IT resources and systems during their course. This is consistent with the recommendation made by Bruskiwitz and De Muth (2005).

Respondents generally perceived handouts and practical schedules as more reliable and trustworthy as no technology or machinery is required to access the resource; consequently, there are no issues of inaccessibility due to mechanical problems, or even of access due to limitations of electronic resources. This latter point was also commented upon in that handouts are always available as there is no requirement to have hardware to facilitate their use. Clearly, on the other hand, a large number of printed resources may be physically difficult to carry and electronic media, which could be as small as a 5-inch CD or DVD disc or a USB memory stick, is convenient to students of all physical abilities. This is an issue which, while possibly perceived as trite or irrelevant, can still have a major impact on the perception of an educational institution by current and potential students.

The interactive benefits of a combination of learning resources has been demonstrated previously (MacLean, McShane, & Etchason, 2001). It was shown that it was more beneficial to students' learning to read or watch and listen to resources than to use only one type of resource and that respondents would use a range of media resources to maximise and enhance their learning. Further, the students questioned in the focus groups in this study indicated that the properties of an ideal educational media tool are a combination of the key advantages provided by handouts, practical schedules and electronic-based media.

A further issue is the content of the media (of any type) provided for students. While students prefer to receive a comprehensive set of learning resources, previous studies have indicated that this may not provide the optimum learning outcomes and may actually be detrimental to the students' academic success. It has been reported that the provision of “skeleton” or outline notes facilitated learning in students more than the provision of comprehensive notes, or no notes at all. Optimal learning was achieved when students were able to personally annotate an outline set of notes and use them as the basis for a complete educational resource (Collingwood & Hughes, 1972; Davis & Hult, 1997; McLennan &

Isaacs, 2002). Therefore, while the question of content differs between staff and students, it would appear that the benefits of any particular media resource provided for students would have to address the perception of what effective learning is, as much as to provide a viable academic resource to facilitate teaching and learning. The effect of student perceptions over what are good and effective resources, compared to resources which may provide “spoon-feeding” or which they feel provide a “one-stop shop” for their course, have not been evaluated in this study. Therefore, the issues of student-centred learning and effective strategies for teaching and learning—from both staff and student perspectives—needs to be examined in further detail. This is of particular importance when considering the skills, professional requirements and academic standards expected of the Mpharm pathway in the UK. Of course, the range of learning styles used by students (Young, Klemz, & Murphy, 2003) clearly demonstrates the flexibility required by educational institutions when providing educational resources to students.

It is also important to discuss the findings of this report in the context of student disability and equal access to educational resources. Provision of suitable materials that do not unfairly disadvantage other students is highlighted by electronic resources, where the nature of the resource, including the font or the colour scheme for written work or the size of pictures and diagrams are important issues and should be considered when preparing electronic resources for use either in the lecture theatre or in other, possibly remote, teaching environments. Electronic resources therefore have the advantage that they can be readily adapted, both by the academic and the student, to ensure the full compliance with disability legislation, providing a flexible mode of delivery for all students.

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