Mapping teaching, learning and assessment in the MPharm in UK schools of pharmacy

By Keith Wilson, Chris Langley, Jill Jesson and Katie Hatfield

Abstract

Aim
To undertake a national study of teaching, learning and assessment in UK schools of pharmacy.

Design
Triangulation of course documentation, 24 semi-structured interviews undertaken with 29 representatives from the schools and a survey of all final year students (n = 1,847) in the 15 schools within the UK during 2003–04.

Subjects and setting
All established UK pharmacy schools and final year MPharm students.

Outcome measures
Data were combined and analysed under the topics of curriculum, teaching and learning, assessment, multi-professional teaching and learning, placement education and research projects.

Results
Professional accreditation was the main driver for curriculum design but links to preregistration training were poor. Curricula were consistent but offered little student choice. On average half the curriculum was science-based. Staff supported the science content but students less so. Courses were didactic but schools were experimenting with new methods of learning. Examinations were the principal form of assessment but the contribution of practice to the final degree ranged considerably (21–63%). Most students considered the assessment load to be about right but with too much emphasis upon knowledge. Assessment of professional competence was focused upon dispensing and pharmacy law. All schools undertook placement teaching in hospitals but there was little in community/primary care. There was little inter-professional education. Resources and logistics were the major limiters.

Conclusions
There is a need for an integrated review of the accreditation process for the MPharm and preregistration training and redefinition of professional competence at an undergraduate level.

A major responsibility of the Royal Pharmaceutical Society of Great Britain (the Society) is ensuring that undergraduate and postgraduate training equips pharmacists with the knowledge and skills they need to practise. It fulfils its responsibility for undergraduate education through accreditation of each school of pharmacy at least once every five years. However, accreditation only gives the story for each school. What is missing is the big picture. The data from accreditation have not been aggregated because they inevitably span at least five years and information relating to each school is gathered in confidence. So, in 2003, a research team from Aston University undertook the first ever national study to document the teaching, learning and assessment of undergraduate MPharm students in the UK. Although a number of individual studies describe a particular aspect of teaching, learning and assessment in single schools[1,2] and others describe innovative teaching developments,[3,4] none gives an overview across all schools.

There is a compelling reason to gather information on pharmacy education. Health professions are currently in the process of unprecedented change. Section 60 of the Health Act 1999 makes provision for changes in the regulation of all health professions with increased public accountability, modernised regulatory and disciplinary procedures and new fitness-to-practise requirements. The definition of requirements and standards for entry to the professional register clearly impinges on undergraduate education and the preregistration process. The purpose of this study was therefore not merely to provide a baseline study to address the fragmentary state of knowledge about teaching, learning and assessment used within schools, but also to help the Society in its deliberations for the future of undergraduate education at a time of substantial change.

Method

The pluralist study design allows comparison, based on qualitative and quantitative evidence across three datasets: (i) course document review, (ii) in depth staff interviews and (iii) student self-completion survey.

Interviews with 29 staff were completed in the 16 schools. The course documentation, downloaded from the internet or obtained from staff, was subjected to content analysis. The information provided in the interviews was cross-checked wherever possible with that in the programme documentation. All interview respondents were sent an outline of the interview schedule one week before the interview, which was taped and transcribed.

The design of the student questionnaire was partly based upon a series of focus groups that were undertaken with 44 participants from nine schools attending the British Pharmaceutical Students Association annual conference in 2004. The questionnaire was piloted and revised accordingly. The study and questionnaire were approved by the Aston University Ethics Committee. The survey of students was distributed to all final year students (in 15/16 schools) via their school of pharmacy using a variety of methods. One school declined to participate in the survey. The variation in method was dictated by the requirements of the schools and was a pragmatic response to difficulties in achieving a common approach. In all schools, one follow up was undertaken to non-respondents.

Results

We have focused upon aspects of the research data that are likely to be of most interest to the pharmacy profession as a whole. A more in-depth set of results can be found by consulting the project report.[5]

The sample frame was the 1,847 students in the final year within UK schools of pharmacy and the overall response rate was 50.6 per cent (n=935). However, the response rate from individual schools varied from 14.4 per cent to 84.6 per cent. The respondent profile was 75 per cent female and 25 per cent male. Self-declared ethnicity, using standard classification, was 52 per cent white, 5.3 per cent black, 22.5 per cent Asian (all groups) and 12 per cent Chinese. We consider this to be a reasonable representation of current undergraduate profile. Data presented in this paper represent the results from the UK student subgroup only (n=741). The following sections summarise the key findings, drawing on documentary review staff interviews and student survey data.

Curriculum change Staff considered that professional accreditation by the Society was the most important external driver for curriculum development. One important finding

Keith A. Wilson, PhD, FRPharmS, is professor of pharmacy practice, Chris A. Langley, PhD, MRPharmS, is lecturer in pharmacy practice and Katie Hatfield, BSc, MRPharmS, is teaching fellow in pharmacy practice at the School of Life and Health Sciences at Aston University. Jill Jesson, PhD, is lecturer in marketing at Aston Business School.
Correspondence to: Professor Keith Wilson, School of Life and Health Sciences, Aston University, Birmingham B4 7ET (e-mail k.a.wilson@aston.ac.uk)

Panel 1: Science and practice in the pharmacy curriculum

- On average, 51% of curriculum time is on pharmaceutical sciences and 31% is professional or clinical topics
- In 13/16 schools science is loaded at the beginning of the course and practice builds up in years 3 and 4, but three schools integrate science and practice teaching over four years
- Staff support maintaining the current science base
- 53% of students (n = 391) considered time devoted to science about right, 36% (n = 267) that it is too much
- 92% of students (n = 680) consider dispensing practice very useful, compared with less than 30% for pharmaceutics, pharmacology or medicinal chemistry practicals

Panel 2: Teaching and learning methods in UK schools of pharmacy

- Average total contact time over four years was 1,544 hours
- On average 51% of the taught element of the curriculum was lecture-based
- On average 31% of the taught element of the curriculum was in the form of laboratory practicals
- On average 18% of the taught element of the curriculum was in the form of small group interactions
- Schools were experimenting with a wide range of teaching and learning methods
- All schools were running learning based on problem-solving
- Six schools offered problem-based learning for selected parts of the curriculum
- 11 schools were using learning portfolios

was that all schools reported either little or no formal interaction with the Society on the content of the preregistration year or the articulation of the degree with the preregistration process. The national pharmacy benchmark statement[6] produced by the Quality Assurance Agency was seen as less important: more of a hurdle to be met than a driver for change.

All schools were aware of both the widening participation and disability agenda and reported that changes or adaptations were made on an as-required basis. However, student numbers was reported as a bigger driver for curriculum change with the recent increases having an effect on how the programmes are delivered, with less small group and individual teaching being possible.

Content analysis of the documents indicated that, on average, the curriculum is equally divided between the main subject areas of pharmacology, pharmaceutics, medicinal chemistry, clinical pharmacy/therapeutics and pharmacy practice. The relatively high level of consistency in the curricula between the schools is likely to reflect a successful accreditation process by the Society and engagement of the schools with this process.

The balance of science and practice in the curriculum has been a frequent topic of debate.[7–9] Our key findings are summarised in Panel 1. Just over half of the students (53 per cent, n=391) considered that the time devoted to pharmaceutical sciences was about right, although about one third (36 per cent, n=267) considered it to be too much. A similar proportion of students (53 per cent, n=392) agreed that the science content was necessary as a base for professional studies in the latter parts of the degree, with just under one third (29 per cent, n=215) disagreeing. Over 70 per cent of students (n=514), considered that there was not enough material relevant to pharmacy practice within the first year of the course and the vast majority of students (over 80 per cent in each case) considered that pharmacy practice and clinical pharmacy should be taught in all years of the MPharm.

Teaching and learning The course documentation provided data on the teaching and learning methods used (see Panel 2). We concluded that courses were relatively didactic with a heavy dependence upon formal lectures. The staff interviews were used to explore less clearly defined learning approaches such as student-centred learning, whether the school provided problem-based learning or teaching, and how to balance the emphasis between attitudes, skills and knowledge. Most respondents were supportive of the concept of a knowledge, skills and attitudes (KSA) map for pharmacy provided that it was indicative and not prescriptive, but resources (financial and staff) were considered a major issue in its extension. Staff recognised the need to develop an awareness of the needs for continuing professional development and most schools (11/15) were using learning portfolios as a means to encourage this.

Assessment It is in the calculations of assessment towards the final degree that we note the most striking differences between schools. The variation in examination load within the final year is of significance to degree awards. Although earlier years make a contribution to the final degree class, in most institutions the final year is the major contributor. Panel 3 summarises the major findings about assessment of the MPharm.

Most students considered that the amount of formal assessment was about right and that the balance between examinations and coursework was about right. However, it was interesting that students appeared to distinguish between the form of the assessment and the skills that it assessed. When asked whether they considered the focus of the MPharm assessment was too much towards memorised knowledge, just over half agreed.

As we noted earlier, frontloading the course with science means that the professional elements of the programme contributed more heavily to the overall assessment of the later years of the programme and therefore to the degree classification. It was clear from staff interviews, that currently the assessment of professional competency is heavily focused upon competence in dispensing and pharmacy law and ethics, a finding that reflected the Society accreditation requirements.

Staff from half of the schools believed that there was probably some degree of over assessment. Most students (63 per cent, n=466) agreed with the statement "I think we seem to have more assessments than other courses".

Research projects A "significant research project" is a Society accreditation requirement, although the term "significant" is not defined.[10] All 16 schools offer final-year research projects with topics spanning the full curriculum from laboratory science to clinical practice and professional studies. On average 40 per cent of the allocated time in the final year was expected to involve the research project, but the documented range within schools was from 26 per cent to 61 per cent. The average rated time for a project was 387 hours with a range from 183 hours to 500 hours.

There was also significant variation in the contribution of the final-year project to the overall degree classification. Data from the 13 schools where it was possible to calculate this showed that, on average, 18 per cent of the degree classification arose from the final year project, but the range was from 8 per cent to 29 per cent.

Given the importance of the project to final degree outcome, the students were asked whether they considered that their training in research methods had provided a good foundation for the project. About one third (36 per cent, n=264) responded that it had and 40 per cent (n=299) that it had not; 24 per cent (n=178) were not sure. There were differences between schools. In three schools over 50 per cent of students were positive about their preparation for the project and conversely in four schools, over 50 per cent of students considered that their preparation had not provided a good foundation for the project.

During the interviews with staff about research project supervision, three common concerns emerged — external supervision, supervisory capacity (an issue linked to student numbers and resources) and the more sensitive issue of supervisory capability (the number of research qualified staff). In spite of these concerns, staff members were positive about the importance of the final-year project

Panel 3: Assessment in the MPharm Degree

- Examinations were the principle form of assessment for the first three years
- The research project accounted for a major part of the final year
- The final year contributed an average 58% of final degree classification (but the range is 40–70%)
- The contribution of practice to overall degree final class ranged from 21% to 63%
- Staff believed there was a tendency to over assess
- 76% of students (n = 562) considered that the amount of formal assessment on their MPharm programme was about right
- 67% of students (n = 498) considered the balance between coursework and examinations was about right
- 57% of students (n = 421) agreed that the course was weighted too far towards measuring knowledge, 40% (n = 290) that it was about right

Panel 4: Multiprofessional learning within the MPharm degree

- Six schools offer some form of multiprofessional learning with students of other health care professions
- One school is in the early years of working through a pilot Department of Health project on multidisciplinary learning
- There is universal agreement on the potential benefits of learning with other professionals
- Practical experience shows the limitations are mainly linked to resource and organisation
- Students who have experience of this innovative practice have ambivalent attitudes

Panel 5: Practical placements in the MPharm degree

- Staff are keen to expand the practical experience of students
- All schools were offering hospital placements as part of their course although the amount varied considerably
- Schools are weak on community or primary care placements mainly due to problems in access and resource
- Most community practice experience is likely to be Saturday or vacation work self-organised by students
- 90% of students (n = 670) want placements and most want placements every year, not just in the final years

with nobody seriously questioning its continuation. In the student survey, 61 per cent (n=443) considered that the project was important. However all schools were faced with increasing difficulty in offering individual projects to the large student cohorts now standard within pharmacy. All had found that the recent changes in NHS research governance and in research ethics requirements were having major effects upon their ability to offer projects in the practice and clinical arena.

Multiprofessional teaching and learning In this study "multiprofessional" is defined as describing co-education with other health professional students and "multidisciplinary" as co-education with students from other disciplines. Didactic teaching was also distinguished from learning where there is interaction between the various students involved.

Staff recognised a clear distinction between multiprofessional education with other health professionals and multidisciplinary education. While the latter was considered to have some value, it was considered that the primary gains in terms of health professional education were only achievable in multiprofessional education which involved interaction between the students.

Of the 16 schools, only six undertook some multiprofessional learning with students of other health care professions, one was involved in some multiprofessional teaching and five undertook some multidisciplinary teaching with other science students. In the other four schools, the whole of the pharmacy programme was delivered only to pharmacy undergraduates. One school was involved in a major Department of Health funded pilot for multidisciplinary learning but at the time of this study, this was only in the first year of operation.

There was widespread support from staff for the principle of multiprofessional learning, regardless of whether the respondent's own school was involved in its delivery but it was interesting to note that there was little support for multiprofessional teaching. The perceived advantages of multiprofessional learning were also similar regardless of involvement in delivery and the principal benefit was that this type of educational experience gave students a wider view of their future professional role and a better understanding of the roles of other professional groups. Sixty per cent of students (n=79) from five of the six schools that offered multiprofessional learning (n=132) found the experience either very or moderately useful.

Staff with experience of multiprofessional learning emphasised that it was difficult to organise. The common experience was that multiprofessional learning must be interactive. In addition, there was recognition of the importance of managing the sessions and of careful planning and preparation. The major findings in relation to multiprofessional learning are summarised in Panel 4.

Learning in practice placements Staff members were also strongly supportive of the concept of practice work placements. All schools provided some learning activity in local hospitals, but the experience in hospital over the four-year programme varied from a few hours to about 16 days. In general placement education was heavily skewed towards the third and final year of study and in most cases placements were based upon local hospitals. Only two schools had placements in community pharmacy. A further two required structured vacational experience.

All schools recognised the need for increased access to practice placements. Staff voiced their frustration at the difficulties involved in developing this aspect of education. There was a general opinion that the major difficulty was in engaging external partners and in funding the placement teaching. Several respondents indicated that movement in this direction would engender change in the internal curriculum — placement education was, therefore, seen as a rate-limiting step for overall curriculum advance. Several schools were working on plans to improve current provision although these were developments of existing provision rather than a major advance on provision.

Students were also strongly supportive of the inclusion of placement education within the MPharm — 90 per cent (n=670) agreed that there should be a placement in at least one year of the programme and 54 per cent (n=402) agreed that there should be practice placements in every year of the programme. The major findings about placement education are summarised in Panel 5.

Discussion

Our results provide a benchmark of teaching, learning and assessment activity in the 16 UK schools of pharmacy during the academic year 2003–04. They indicate the high importance given by schools of pharmacy to the Society's accreditation process. This is likely to be an important factor contributing to the consistency of curriculum that was observed within the sector. However, there were major differences in the way in which the final degree mark was calculated and, therefore, in the contribution to this of various elements of the programme (eg, project, practice, science). In educational terms this is a positive finding but, for a professional degree, it raises issues about the meaning of the classification system in relation to practice.

The centrality of the accreditation process to curriculum design also raises another important question for the future of pharmacy undergraduate education and that is about the balance between the need for a common core curriculum that characterises pharmacy and the need for diversity to respond to individual preferences and widening professional roles. With the exception of the final-year project, schools offered students no, or minimum, choice. Widening professional roles and the inevitable specialisation that will follow

must raise questions about the need for wider curriculum choice. It is notable that within the new medical undergraduate curriculum[11] there is a recommendation that 25–30 per cent of the curriculum should be determined by the individual student.

The study has raised an important question about the role of the research project. There is a specific accreditation requirement for a substantial project without reference to the underlying qualities that it should develop. If the intention it to develop an appreciation and understanding of research methods and to encourage critical thinking then there are well established alternative approaches. Although generally liked by staff and students, the resource and staff issues of continuing individual projects need to be balanced against the increasing demands for clinical and practice education.

The study has highlighted a number of questions about the relationship of pharmacy undergraduate education and practice. We would consider the most important to be the lack of communication between schools and the Society in relation to articulation of the undergraduate degree with the preregistration process. Among the UK health professions, pharmacy is unusual in that the undergraduate programme is funded by the Higher Education Funding Councils as a science-based degree without any formal provision for learning within the practice environment. The preregistration year, therefore, becomes a critical component in the total educational process and in the assessment of professional competence. We believe that this study provides a strong argument for a formal engagement between the Society and the schools of pharmacy to reconsider the linkage between the undergraduate degree and the preregistration training process.

It was encouraging to find that schools were also using a wide range of course work assessment and that there was evidence of innovation and experimentation in the approaches to learning methods. There was also strong support from staff for multiprofessional learning and for workplace learning in placements. However, the reality at the time of the study was that across the whole system there was little shared curriculum with other health professionals or other disciplines. These findings contrast with the world in which pharmacists and other health professions work, where changing models of health care delivery are driving a re-evaluation of the professional boundaries and new ways of working.[12,13] A key policy driver for health professional education is placement learning - or learning in practice.[14] In most other health professional education, learning in practice is integrated within the degree and so the university and the health providers (usually the NHS) are involved in a formal collaboration. This is not the case for pharmacy, which in the UK is funded as a science-based degree with no formal obligation on the NHS to make provision for undergraduate placements. Therefore the finding that all schools were providing formal teaching in hospitals is commendable and a positive reflection of the attitude of schools and the commitment of NHS pharmacy departments to engage with the educational process. In the overall context it is not surprising that the length and nature of the placement varied. However, all schools found great difficulty in implementing formal placement education within community pharmacy. This is a challenge for the profession — not least because of its position on the boundary between the public and commercial sectors. Support for education is a professional obligation for doctors.[15] The results from this study convinced us that, for the future development of professional pharmacy education, there needs to be a similar obligation within pharmacy that extends from the individual professional to the corporate operator. The provision of Saturday and holiday work experience in community pharmacy for pharmacy undergraduates is desirable but not enough.

Government White Papers[13,16–19] and reports into failures in health professional performance[20–22] have emphasised that health professional education is not just about knowledge and skills, but also about the development and inculcation of professional attitudes and beliefs. The General Medical Council's requirements for undergraduate medical education[11] make explicit reference to the need to develop knowledge, skills and attitudes. Staff from the schools of pharmacy were generally supportive of the concept of a knowledge, skills and attitudes framework for pharmacy education but most respondents had difficulty in articulating any planned approach to the assessment of clinical or professional competence. On reflection, we suggest that this finding can largely be attributed to the accreditation requirements for pharmacy in which currently the only mandatory requirements for professional competency are linked to dispensing and pharmacy law. This is an area outside education where the profession must lead through clear definition and articulation of the core determinants of a pharmacist.

Recommendations

Our study raised issues about professional competence and performance and its assessment within the pharmacy undergraduate degree and professional registration training.

As a result of the findings of this study we recommend:

- An immediate further review of the scope and method for the accreditation process in partnership with the schools of pharmacy
- A fundamental review of the interrelationship between the undergraduate degree and preregistration training so that knowledge, skills, attitudes and beliefs can be developed systematically during a structured period of university and practice learning
- Formation of a joint working group between the Royal Pharmaceutical Society and the schools of pharmacy to develop a forward strategy with respect to the academic workforce and the access of additional funding to support placement education of pharmacy undergraduates

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